

COMPUTERS AND OPERATING SYSTEMS

Rijoy Kodiyan Jacob

January 9, 2022



SYLLABUS-2020 REVISION

Computer-Evolution of computers-Basic ideas about the parts of a computer, Input devices, Output devices, Memory, Storage devices and Operating systems.
Evolution of internet- Scientific data bases and useful educational websites.



WHAT IT IS ..

WHAT IS A COMPUTER?

A computer is a high speed data processing machine. It accepts data as input, processes the data and generates output.



WHAT IT IS ..

WHAT IS A COMPUTER?

A computer is a high speed data processing machine. It accepts data as input, processes the data and generates output.



WHAT IT IS ..

WHAT IS A COMPUTER?

A computer is a high speed data processing machine. It accepts data as input, processes the data and generates output.



IN OTHER WORDS...

A computer is defined as an electronic machine that process raw data under program control to give meaningful information with speed and accuracy.

- A computer system is a basic, complete and functional computer, including all the hardware and software required to make it functional for a user.

Rijoy K.J.



- A computer system is a basic, complete and functional computer, including all the hardware and software required to make it functional for a user.
- It should have the ability to receive user input, process data, and with the processed data, create information for storage and/or output.

Rijoy



- A computer system is a basic, complete and functional computer, including all the hardware and software required to make it functional for a user.
- It should have the ability to receive user input, process data, and with the processed data, create information for storage and/or output.
- A computer system allows users to input, manipulate and store data. Computer systems typically include a computer, monitor, keyboard, mouse and other optional components.

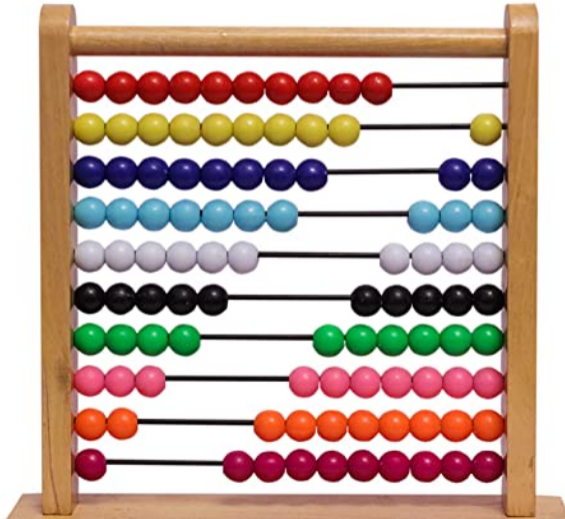
Rijoy



- A computer system is a basic, complete and functional computer, including all the hardware and software required to make it functional for a user.
- It should have the ability to receive user input, process data, and with the processed data, create information for storage and/or output.
- A computer system allows users to input, manipulate and store data. Computer systems typically include a computer, monitor, keyboard, mouse and other optional components.
- All of these components also can be integrated into all-in-one units, such as laptop computers.



ABACUS



ABACUS....CONTD.

- Many centuries ago when man started to count the numbers, he thought of a device which can trace the numbers and thus came the existence of ABACUS.

Rijoy K J



ABACUS....CONTD.

- Many centuries ago when man started to count the numbers, he thought of a device which can trace the numbers and thus came the existence of ABACUS.
- It was the first counting device which was developed in China more than 3000 years ago.

Rijoy



ABACUS....CONTD.

- Many centuries ago when man started to count the numbers, he thought of a device which can trace the numbers and thus came the existence of ABACUS.
- It was the first counting device which was developed in China more than 3000 years ago.
- The name Abacus was obtained from Greek word Abax which means slab.



ABACUS....CONTD.

- Many centuries ago when man started to count the numbers, he thought of a device which can trace the numbers and thus came the existence of ABACUS.
- It was the first counting device which was developed in China more than 3000 years ago.
- The name Abacus was obtained from Greek word Abax which means slab.
- This device basically consists of a rectangular wooden frame and beads.



ABACUS....CONTD.

- Many centuries ago when man started to count the numbers, he thought of a device which can trace the numbers and thus came the existence of ABACUS.
- It was the first counting device which was developed in China more than 3000 years ago.
- The name Abacus was obtained from Greek word Abax which means slab.
- This device basically consists of a rectangular wooden frame and beads.
- The frame contains horizontal rods and the beads which have holes are passed through the rods.



ABACUS....CONTD.

- Many centuries ago when man started to count the numbers, he thought of a device which can trace the numbers and thus came the existence of ABACUS.
- It was the first counting device which was developed in China more than 3000 years ago.
- The name Abacus was obtained from Greek word Abax which means slab.
- This device basically consists of a rectangular wooden frame and beads.
- The frame contains horizontal rods and the beads which have holes are passed through the rods.
- Counting was done by moving the beads from one end of the frame to the other.



NAPIER'S BONES

- Napier's Bones- It is a device which contains a set of rods made of bones.

Rijoy K.J.



NAPIER'S BONES

- Napier's Bones- It is a device which contains a set of rods made of bones.
- It was developed by John Napier, a Scottish Mathematician and hence the device was named as Napier's Bones.

Rijoy K J



NAPIER'S BONES

- Napier's Bones- It is a device which contains a set of rods made of bones.
- It was developed by John Napier, a Scottish Mathematician and hence the device was named as Napier's Bones.
- The device was mainly developed for performing multiplication and division.

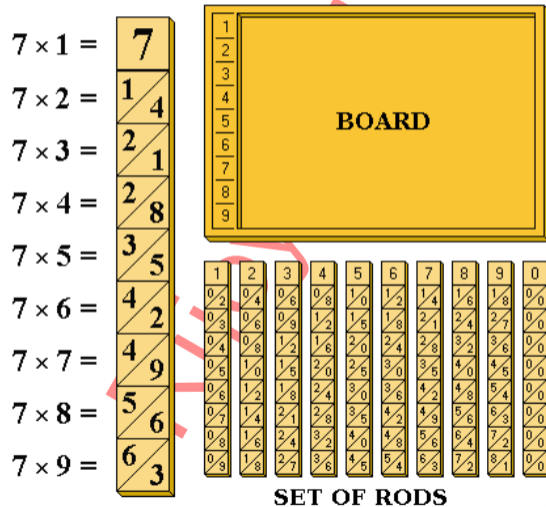


NAPIER'S BONES

- Napier's Bones- It is a device which contains a set of rods made of bones.
- It was developed by John Napier, a Scottish Mathematician and hence the device was named as Napier's Bones.
- The device was mainly developed for performing multiplication and division.
- Later in 1614 he also introduced logarithms.



NAPIER'S BONES...CONTD...



PASCALINE

- Pascaline is a calculating machine developed by Blaise Pascal, a French Mathematician.

Rijoy K.J.



PASCALINE

- Pascaline is a calculating machine developed by Blaise Pascal, a French Mathematician.
- It was the first device with an ability to perform additions and subtractions on whole numbers.

Rijoy K J



PASCALINE

- Pascaline is a calculating machine developed by Blaise Pascal, a French Mathematician.
- It was the first device with an ability to perform additions and subtractions on whole numbers.
- The device is made up of interlocked cog wheels which contains numbers 0 to 9 on its circumference.



PASCALINE

- Pascaline is a calculating machine developed by Blaise Pascal, a French Mathematician.
- It was the first device with an ability to perform additions and subtractions on whole numbers.
- The device is made up of interlocked cog wheels which contains numbers 0 to 9 on its circumference.
- When one wheel completes its rotation the other wheel moves by one segment.

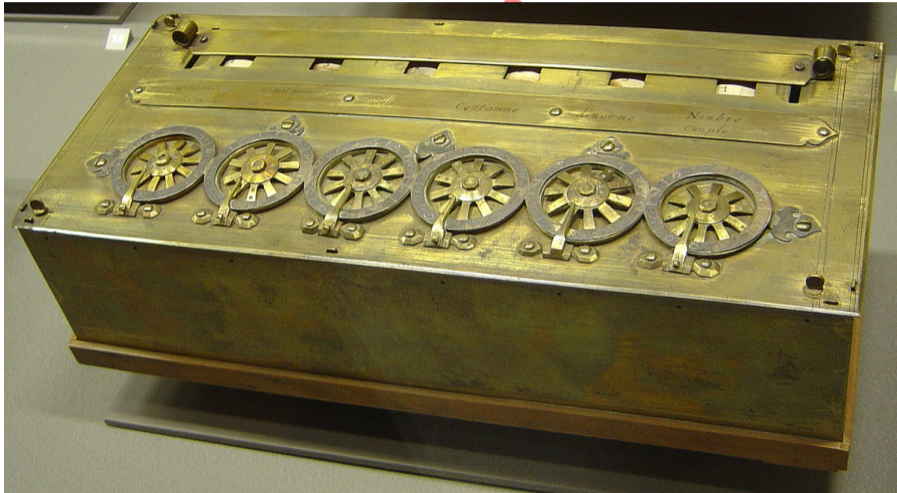


PASCALINE

- Pascaline is a calculating machine developed by Blaise Pascal, a French Mathematician.
- It was the first device with an ability to perform additions and subtractions on whole numbers.
- The device is made up of interlocked cog wheels which contains numbers 0 to 9 on its circumference.
- When one wheel completes its rotation the other wheel moves by one segment.
- Pascal patented this device in 1647 and produced it on mass scale and earned a handful of money.



PASCALINE



CHARLES BABBAGE-THE UNCLE OF MODERN COMPUTER

- First idea for a computer was actually developed starting in 1837.

Rijoy K J



CHARLES BABBAGE-THE UNCLE OF MODERN COMPUTER

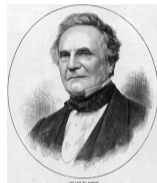
- First idea for a computer was actually developed starting in 1837.
- Charles Babbage was the brain behind the idea, and was famous for his Difference Engine (completed in the early 1830s.) and the Analytical Engine (was never completed) both had the potential to be very powerful, especially for the time period.

Rijoy



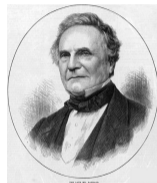
CHARLES BABBAGE-THE UNCLE OF MODERN COMPUTER

- First idea for a computer was actually developed starting in 1837.
- Charles Babbage was the brain behind the idea, and was famous for his Difference Engine (completed in the early 1830s.) and the Analytical Engine (was never completed) both had the potential to be very powerful, especially for the time period.
- The Difference Engine (1832) could compute simple calculations, like multiplication or addition, but its most important trait was its ability create tables of the results of up to seven-degree polynomial functions, but it was never complete.



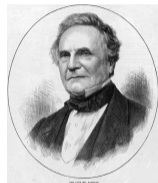
CHARLES BABBAGE-THE UNCLE OF MODERN COMPUTER

- First idea for a computer was actually developed starting in 1837.
- Charles Babbage was the brain behind the idea, and was famous for his Difference Engine (completed in the early 1830s.) and the Analytical Engine (was never completed) both had the potential to be very powerful, especially for the time period.
- The Difference Engine (1832) could compute simple calculations, like multiplication or addition, but its most important trait was its ability create tables of the results of up to seven-degree polynomial functions, but it was never complete.
- The Analytical Engine (1837) was the first machine come up with the idea of programming.



CHARLES BABBAGE-THE UNCLE OF MODERN COMPUTER

- First idea for a computer was actually developed starting in 1837.
- Charles Babbage was the brain behind the idea, and was famous for his Difference Engine (completed in the early 1830s.) and the Analytical Engine (was never completed) both had the potential to be very powerful, especially for the time period.
- The Difference Engine (1832) could compute simple calculations, like multiplication or addition, but its most important trait was its ability create tables of the results of up to seven-degree polynomial functions, but it was never complete.
- The Analytical Engine (1837) was the first machine come up with the idea of programming.
- Babbage, a true computer pioneer, is known as the "Uncle" of computers, due to his early, but isolated contributions to the field.



FIRST GENERATION COMPUTERS 1940-1956

- The first generation of computer were huge, slow, expensive and often unreliable.

Rijoy K.J.



FIRST GENERATION COMPUTERS 1940-1956

- The first generation of computer were huge, slow, expensive and often unreliable.
- In 1946, two Americans, Presper Eckert and Willian Mauchly build the ENIAC (Electronic Numerical Integrator and Computer).

Rijoy V J



FIRST GENERATION COMPUTERS 1940-1956

- The first generation of computer were huge, slow, expensive and often unreliable.
- In 1946, two Americans, Presper Eckert and Willian Mauchly build the ENIAC (Electronic Numerical Integrator and Computer).
- It used vacuum tubes instead of mechanical switches of the MARK.

FEATURES AND ADVANTAGES

- It could perform five basic arithmetic operations: addition, subtraction, multiplication, division and table reference.



FIRST GENERATION COMPUTERS 1940-1956

- The first generation of computer were huge, slow, expensive and often unreliable.
- In 1946, two Americans, Presper Eckert and Willian Mauchly build the ENIAC (Electronic Numerical Integrator and Computer).
- It used vacuum tubes instead of mechanical switches of the MARK.

FEATURES AND ADVANTAGES

- It could perform five basic arithmetic operations: addition, subtraction, multiplication, division and table reference.
- It took approximately 0.3 seconds to add two numbers and 4.5 seconds for multiplication of two numbers.



FIRST GENERATION COMPUTERS 1940-1956

- The first generation of computer were huge, slow, expensive and often unreliable.
- In 1946, two Americans, Presper Eckert and Willian Mauchly build the ENIAC (Electronic Numerical Integrator and Computer).
- It used vacuum tubes instead of mechanical switches of the MARK.

FEATURES AND ADVANTAGES

- It could perform five basic arithmetic operations: addition, subtraction, multiplication, division and table reference.
- It took approximately 0.3 seconds to add two numbers and 4.5 seconds for multiplication of two numbers.

DISADVANTAGES

- It was huge in size



FIRST GENERATION COMPUTERS 1940-1956

- The first generation of computer were huge, slow, expensive and often unreliable.
- In 1946, two Americans, Presper Eckert and Willian Mauchly build the ENIAC (Electronic Numerical Integrator and Computer).
- It used vacuum tubes instead of mechanical switches of the MARK.

FEATURES AND ADVANTAGES

- It could perform five basic arithmetic operations: addition, subtraction, multiplication, division and table reference.
- It took approximately 0.3 seconds to add two numbers and 4.5 seconds for multiplication of two numbers.

DISADVANTAGES

- It was huge in size
- Complex in design.



FIRST GENERATION COMPUTERS 1940-1956

- The first generation of computer were huge, slow, expensive and often unreliable.
- In 1946, two Americans, Presper Eckert and Willian Mauchly build the ENIAC (Electronic Numerical Integrator and Computer).
- It used vacuum tubes instead of mechanical switches of the MARK.

FEATURES AND ADVANTAGES

- It could perform five basic arithmetic operations: addition, subtraction, multiplication, division and table reference.
- It took approximately 0.3 seconds to add two numbers and 4.5 seconds for multiplication of two numbers.

DISADVANTAGES

- It was huge in size
- Complex in design.
- Very slow



FIRST GENERATION COMPUTERS 1940-1956

- The first generation of computer were huge, slow, expensive and often unreliable.
- In 1946, two Americans, Presper Eckert and Willian Mauchly build the ENIAC (Electronic Numerical Integrator and Computer).
- It used vacuum tubes instead of mechanical switches of the MARK.

FEATURES AND ADVANTAGES

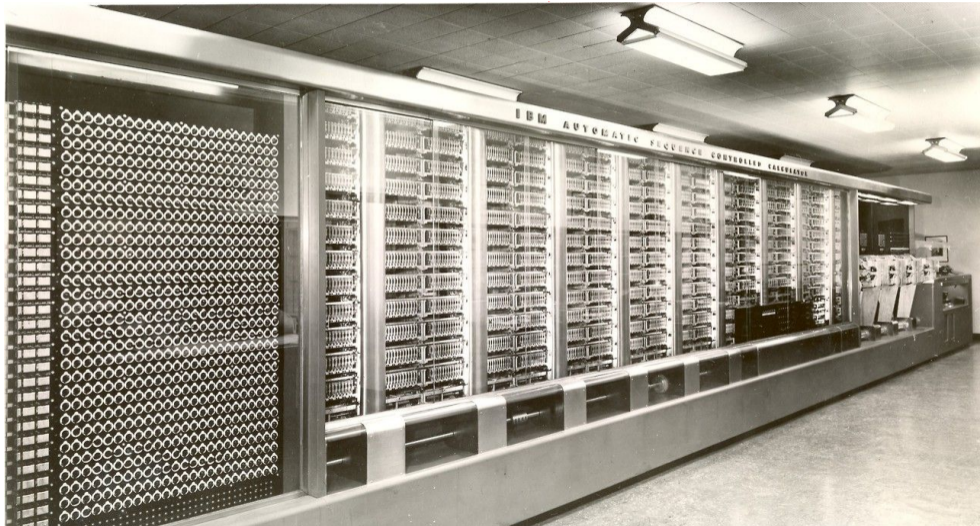
- It could perform five basic arithmetic operations: addition, subtraction, multiplication, division and table reference.
- It took approximately 0.3 seconds to add two numbers and 4.5 seconds for multiplication of two numbers.

DISADVANTAGES

- It was huge in size
- Complex in design.
- Very slow



MARK I



FIRST GENERATION- UNIVAC

- The UNIVAC (universal automatic Computer) was the first digital computer invented by Mauchly and Ekert.

Rijoy K.J.



FIRST GENERATION- UNIVAC

- The UNIVAC (universal automatic Computer) was the first digital computer invented by Mauchly and Eckert.
- In 1951, Eckert and Mauchly build the UNIVAC, which could calculate at the rate of 10,000 addition per seconds.



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

Rijoy K.J



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.

Rijoy K.J



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.
- Transistor is a small device that transfers electronic signals through resistors.

Rijoy K J



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.
- Transistor is a small device that transfers electronic signals through resistors.
- The creation of transistor spark the production of a wave of second generation computer.

Rijoy



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.
- Transistor is a small device that transfers electronic signals through resistors.
- The creation of transistor spark the production of a wave of second generation computer.
- Transistor was small devices use to transfer electronic signals across a resister.

Rijoy



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.
- Transistor is a small device that transfers electronic signals through resistors.
- The creation of transistor spark the production of a wave of second generation computer.
- Transistor was small devices use to transfer electronic signals across a resister.
- Transistors had many advantages compared to other hardware technology.



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.
- Transistor is a small device that transfers electronic signals through resistors.
- The creation of transistor spark the production of a wave of second generation computer.
- Transistor was small devices use to transfer electronic signals across a resister.
- Transistors had many advantages compared to other hardware technology.
 - Transistors were smaller than vacuum tubes.



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.
- Transistor is a small device that transfers electronic signals through resistors.
- The creation of transistor spark the production of a wave of second generation computer.
- Transistor was small devices use to transfer electronic signals across a resister.
- Transistors had many advantages compared to other hardware technology.
 - Transistors were smaller than vacuum tubes.
 - They needed no warm up time.



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.
- Transistor is a small device that transfers electronic signals through resistors.
- The creation of transistor spark the production of a wave of second generation computer.
- Transistor was small devices use to transfer electronic signals across a resister.
- Transistors had many advantages compared to other hardware technology.
 - Transistors were smaller than vacuum tubes.
 - They needed no warm up time.
 - Consumed less energy.



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.
- Transistor is a small device that transfers electronic signals through resistors.
- The creation of transistor spark the production of a wave of second generation computer.
- Transistor was small devices use to transfer electronic signals across a resister.
- Transistors had many advantages compared to other hardware technology.
 - Transistors were smaller than vacuum tubes.
 - They needed no warm up time.
 - Consumed less energy.
 - Generated much less heat.



SECOND GENERATION COMPUTERS 1956-1963

Features of second Generation computers were the following:

- Vacuum tubes were replaced by transistors.
- Transistor is a small device that transfers electronic signals through resistors.
- The creation of transistor spark the production of a wave of second generation computer.
- Transistor was small devices use to transfer electronic signals across a resister.
- Transistors had many advantages compared to other hardware technology.
 - Transistors were smaller than vacuum tubes.
 - They needed no warm up time.
 - Consumed less energy.
 - Generated much less heat.
 - Faster and more reliable.



THIRD GENERATION 1964-1971

Features of third generation Computers are:

Rijoy K.J.



THIRD GENERATION 1964-1971

Features of third generation Computers are:

- In this generation microelectronics technology was introduced that made it possible to integrate large number of circuit elements into very small surface of silicon known as chips.

Rijoy



THIRD GENERATION 1964-1971

Features of third generation Computers are:

- In this generation microelectronics technology was introduced that made it possible to integrate large number of circuit elements into very small surface of silicon known as chips.
- This new technology was called INTEGRATED CIRCUIT (IC)

Rijoy K J



THIRD GENERATION 1964-1971

Features of third generation Computers are:

- In this generation microelectronics technology was introduced that made it possible to integrate large number of circuit elements into very small surface of silicon known as chips.
- This new technology was called INTEGRATED CIRCUIT (IC)



THIRD GENERATION 1964-1971

Features of third generation Computers are:

- In this generation microelectronics technology was introduced that made it possible to integrate large number of circuit elements into very small surface of silicon known as chips.
- This new technology was called INTEGRATED CIRCUIT (IC)



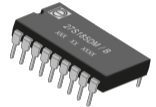
INTEGRATED CIRCUITS

A new concept in this generation was that of a family of computer which allowed computer to be upgraded and expanded as necessary.

THIRD GENERATION 1964-1971

Features of third generation Computers are:

- In this generation microelectronics technology was introduced that made it possible to integrate large number of circuit elements into very small surface of silicon known as chips.
- This new technology was called INTEGRATED CIRCUIT (IC)



INTEGRATED CIRCUITS

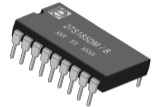
A new concept in this generation was that of a family of computer which allowed computer to be upgraded and expanded as necessary.

- Silicone chips were reliable, compact and cheaper.

THIRD GENERATION 1964-1971

Features of third generation Computers are:

- In this generation microelectronics technology was introduced that made it possible to integrate large number of circuit elements into very small surface of silicon known as chips.
- This new technology was called INTEGRATED CIRCUIT (IC)



INTEGRATED CIRCUITS

A new concept in this generation was that of a family of computer which allowed computer to be upgraded and expanded as necessary.

- Silicone chips were reliable, compact and cheaper.
- Sold hardware and software separately which created the software industry.

THIRD GENERATION 1964-1971

Features of third generation Computers are:

- In this generation microelectronics technology was introduced that made it possible to integrate large number of circuit elements into very small surface of silicon known as chips.
- This new technology was called INTEGRATED CIRCUIT (IC)



INTEGRATED CIRCUITS

A new concept in this generation was that of a family of computer which allowed computer to be upgraded and expanded as necessary.

- Silicone chips were reliable, compact and cheaper.
- Sold hardware and software separately which created the software industry.
- Customer service industry flourished (reservation and credit checks)

FOURTH GENERATION-1971-PRESENT

It took only 55 years for the 4 generations to evolve. The growth of the computer industry developed technologies of computer inventions. There are many types of computer models such as:

Rijoy K.J.



FOURTH GENERATION-1971-PRESENT

It took only 55 years for the 4 generations to evolve. The growth of the computer industry developed technologies of computer inventions. There are many types of computer models such as:



acer

BenQ

COMPAQ



FUJITSU



Gateway.

HCL



IBM

lenovo



msi



SONY
VAIO

TOSHIBA



- In 1971 Intel created the first microprocessor.
- In 1976, Steve Jobs built the first Apple computer.

Rijoy K.J.



- In 1971 Intel created the first microprocessor.
- In 1976, Steve Jobs built the first Apple computer.
- Then, in 1981, IBM introduced its first personal computer.

Rijoy K.J



- In 1971 Intel created the first microprocessor.
- In 1976, Steve Jobs built the first Apple computer.
- Then, in 1981, IBM introduced its first personal computer.
- During the fourth generation, hardware technology such as silicone chips, microprocessor and storage devices were invented.

Rijoy K J



- In 1971 Intel created the first microprocessor.
- In 1976, Steve Jobs built the first Apple computer.
- Then, in 1981, IBM introduced its first personal computer.
- During the fourth generation, hardware technology such as silicone chips, microprocessor and storage devices were invented.
- A microprocessor is a specialized chip which is developed for computer memory and logic.

Rijoy



- In 1971 Intel created the first microprocessor.
- In 1976, Steve Jobs built the first Apple computer.
- Then, in 1981, IBM introduced its first personal computer.
- During the fourth generation, hardware technology such as silicone chips, microprocessor and storage devices were invented.
- A microprocessor is a specialized chip which is developed for computer memory and logic.
- The microprocessor is a large-scale integrated circuit which contained thousands of transistors.

Rijoy



- In 1971 Intel created the first microprocessor.
- In 1976, Steve Jobs built the first Apple computer.
- Then, in 1981, IBM introduced its first personal computer.
- During the fourth generation, hardware technology such as silicone chips, microprocessor and storage devices were invented.
- A microprocessor is a specialized chip which is developed for computer memory and logic.
- The microprocessor is a large-scale integrated circuit which contained thousands of transistors.
- The transistors on this one chip are capable of performing all of the functions of a computer's central processing unit.



- In 1971 Intel created the first microprocessor.
- In 1976, Steve Jobs built the first Apple computer.
- Then, in 1981, IBM introduced its first personal computer.
- During the fourth generation, hardware technology such as silicone chips, microprocessor and storage devices were invented.
- A microprocessor is a specialized chip which is developed for computer memory and logic.
- The microprocessor is a large-scale integrated circuit which contained thousands of transistors.
- The transistors on this one chip are capable of performing all of the functions of a computer's central processing unit.
- Advantages:
 - Computers became 100 times smaller than ENIAC (Electronic Numerical Integrator and Computer) the first computer.



- In 1971 Intel created the first microprocessor.
- In 1976, Steve Jobs built the first Apple computer.
- Then, in 1981, IBM introduced its first personal computer.
- During the fourth generation, hardware technology such as silicone chips, microprocessor and storage devices were invented.
- A microprocessor is a specialized chip which is developed for computer memory and logic.
- The microprocessor is a large-scale integrated circuit which contained thousands of transistors.
- The transistors on this one chip are capable of performing all of the functions of a computer's central processing unit.
- Advantages:
 - Computers became 100 times smaller than ENIAC (Electronic Numerical Integrator and Computer) the first computer.
 - Gain in speed, reliability and storage capacity.



- In 1971 Intel created the first microprocessor.
- In 1976, Steve Jobs built the first Apple computer.
- Then, in 1981, IBM introduced its first personal computer.
- During the fourth generation, hardware technology such as silicone chips, microprocessor and storage devices were invented.
- A microprocessor is a specialized chip which is developed for computer memory and logic.
- The microprocessor is a large-scale integrated circuit which contained thousands of transistors.
- The transistors on this one chip are capable of performing all of the functions of a computer's central processing unit.
- Advantages:
 - Computers became 100 times smaller than ENIAC (Electronic Numerical Integrator and Computer) the first computer.
 - Gain in speed, reliability and storage capacity.
 - Personal and software industry boomed.



FIFTH GENERATION (PRESENT AND BEYOND)

The fifth generation computers are technologically advance and are still being development to become more efficient. The inventions of new hardware technology in the fifth generation have grown rapidly including many other modern computer devices such as :

Rijoy K S



FIFTH GENERATION (PRESENT AND BEYOND)

The fifth generation computers are technologically advance and are still being development to become more efficient. The inventions of new hardware technology in the fifth generation have grown rapidly including many other modern computer devices such as :

- Silicone chips
- Processor
- Robotics
- Virtual reality
- Intelligent systems
- Programs which translate languages



FIFTH GENERATION (PRESENT AND BEYOND)

The fifth generation computers are technologically advance and are still being development to become more efficient. The inventions of new hardware technology in the fifth generation have grown rapidly including many other modern computer devices such as :

- Silicone chips
- Processor
- Robotics
- Virtual reality
- Intelligent systems
- Programs which translate languages



NEW ERA COMPUTER

After the fifth generation computer, the technology of computer has become more advanced, modern and sophisticated. The latest invention in the era of computers are :

Rijoy K



NEW ERA COMPUTER

After the fifth generation computer, the technology of computer has become more advanced, modern and sophisticated. The latest invention in the era of computers are :

- Super Computers.

Rijoy K



NEW ERA COMPUTER

After the fifth generation computer, the technology of computer has become more advanced, modern and sophisticated. The latest invention in the era of computers are :

- Super Computers.
- Mainframe Computers.

Rijoy K



NEW ERA COMPUTER

After the fifth generation computer, the technology of computer has become more advanced, modern and sophisticated. The latest invention in the era of computers are :

- Super Computers.
- Mainframe Computers.
- Mini Computers.

Rijoy K



NEW ERA COMPUTER

After the fifth generation computer, the technology of computer has become more advanced, modern and sophisticated. The latest invention in the era of computers are :

- Super Computers.
- Mainframe Computers.
- Mini Computers.
- Personal Computers.

Rijoy K



NEW ERA COMPUTER

After the fifth generation computer, the technology of computer has become more advanced, modern and sophisticated. The latest invention in the era of computers are :

- Super Computers.
- Mainframe Computers.
- Mini Computers.
- Personal Computers.
- Mobile Computers.

Rijoy K



NEW ERA COMPUTER

After the fifth generation computer, the technology of computer has become more advanced, modern and sophisticated. The latest invention in the era of computers are :

- Super Computers.
- Mainframe Computers.
- Mini Computers.
- Personal Computers.
- Mobile Computers.

FEATURES

In the new era of computers, expert system such as teleconferencing and speech-recognition system have been invented as part of modern world communication tools.

COMPONENTS OF A COMPUTER

Rijoy K.J.



COMPONENTS OF A COMPUTER

A computer is a system consists of the following interrelated components.

Rijoy K.J.



COMPONENTS OF A COMPUTER

A computer is a system consists of the following interrelated components.

- **Input:-** The input devices include key boards, electronic mouse, optical scanners and touch screens which convert data into machine readable form.

Rijoy



COMPONENTS OF A COMPUTER

A computer is a system consists of the following interrelated components.

- Input:- The input devices include key boards, electronic mouse, optical scanners and touch screens which convert data into machine readable form.
- Processing :- CPU is the most important component of the computer system. It is made up of:

Rijoy K J



COMPONENTS OF A COMPUTER

A computer is a system consists of the following interrelated components.

- Input:- The input devices include key boards, electronic mouse, optical scanners and touch screens which convert data into machine readable form.
- Processing :- CPU is the most important component of the computer system. It is made up of:
 - Control.



COMPONENTS OF A COMPUTER

A computer is a system consists of the following interrelated components.

- Input:- The input devices include key boards, electronic mouse, optical scanners and touch screens which convert data into machine readable form.
- Processing :- CPU is the most important component of the computer system. It is made up of:
 - Control.
 - Arithmetic unit and



COMPONENTS OF A COMPUTER

A computer is a system consists of the following interrelated components.

- Input:- The input devices include key boards, electronic mouse, optical scanners and touch screens which convert data into machine readable form.
- Processing :- CPU is the most important component of the computer system. It is made up of:
 - Control.
 - Arithmetic unit and
 - Logic unit



COMPONENTS OF A COMPUTER

A computer is a system consists of the following interrelated components.

- Input:- The input devices include key boards, electronic mouse, optical scanners and touch screens which convert data into machine readable form.
- Processing :- CPU is the most important component of the computer system. It is made up of:
 - Control.
 - Arithmetic unit and
 - Logic unit
- Output :- Convert processed information into human intelligible form for presentation. e.g. VDU, printers, audio response units, etc.



COMPONENTS OF COMPUTER - CONTD...

Rijoy K.J.



COMPONENTS OF COMPUTER - CONTD...

- Storage :- Storage devices store data and program instructions required for processing. There are two types of storage devices.

Rijoy



COMPONENTS OF COMPUTER - CONTD...

- Storage :- Storage devices store data and program instructions required for processing. There are two types of storage devices.
 - ① Primary e.g. HDD

Rijoy K J



COMPONENTS OF COMPUTER - CONTD...

- Storage :- Storage devices store data and program instructions required for processing. There are two types of storage devices.
 - 1 Primary e.g. HDD
 - 2 Secondary e.g. Magnetic disks and tapes.

Rijoy



COMPONENTS OF COMPUTER - CONTD...

- Storage :- Storage devices store data and program instructions required for processing. There are two types of storage devices.
 - 1 Primary e.g. HDD
 - 2 Secondary e.g. Magnetic disks and tapes.
- Control:- Control unit of the CPU controls the entire computer system. It directs and coordinates the various components of a computer like input devices and output devices.



PERSONAL COMPUTERS

- Computers designed and developed primarily for personal use.

Rijoy K.J.



PERSONAL COMPUTERS

- Computers designed and developed primarily for personal use.
- Used by the user without the help of an operator.

Rijoy K J



PERSONAL COMPUTERS

- Computers designed and developed primarily for personal use.
- Used by the user without the help of an operator.
- Components are CPU, operator key board, disk drives, a monitor or VDU.

Rijoy K J



PERSONAL COMPUTERS

- Computers designed and developed primarily for personal use.
- Used by the user without the help of an operator.
- Components are CPU, operator key board, disk drives, a monitor or VDU.
- Ready-made programs and applications like word processors, spread sheets, data bases, and web browsers are available.



PERSONAL COMPUTERS

- Computers designed and developed primarily for personal use.
- Used by the user without the help of an operator.
- Components are CPU, operator key board, disk drives, a monitor or VDU.
- Ready-made programs and applications like word processors, spread sheets, data bases, and web browsers are available.
- Finds use in home or an office.



PERSONAL COMPUTERS

- Computers designed and developed primarily for personal use.
- Used by the user without the help of an operator.
- Components are CPU, operator key board, disk drives, a monitor or VDU.
- Ready-made programs and applications like word processors, spread sheets, data bases, and web browsers are available.
- Finds use in home or an office.
- LAN and wireless connections are available.



TYPES OF PERSONAL COMPUTERS

There are a wide variety of PCs.

Rijoy K.J.



TYPES OF PERSONAL COMPUTERS

There are a wide variety of PCs.

- Desktop computers.

Rijoy K.J.



TYPES OF PERSONAL COMPUTERS

There are a wide variety of PCs.

- Desktop computers.
- Work stations.

Rijoy K.J.



TYPES OF PERSONAL COMPUTERS

There are a wide variety of PCs.

- Desktop computers.
- Work stations.
- Portable Computers.

Rijoy K.J.



TYPES OF PERSONAL COMPUTERS

There are a wide variety of PCs.

- Desktop computers.
- Work stations.
- Portable Computers.
- Laptops or Notebooks.

Rijoy K.J.



TYPES OF PERSONAL COMPUTERS

There are a wide variety of PCs.

- Desktop computers.
- Work stations.
- Portable Computers.
- Laptops or Notebooks.
- Tablet PC.

Rijoy K.J.



TYPES OF PERSONAL COMPUTERS

There are a wide variety of PCs.

- Desktop computers.
- Work stations.
- Portable Computers.
- Laptops or Notebooks.
- Tablet PC.
- Personal Digital Assistants.

Rijoy K.J.



TYPES OF PERSONAL COMPUTERS

There are a wide variety of PCs.

- Desktop computers.
- Work stations.
- Portable Computers.
- Laptops or Notebooks.
- Tablet PC.
- Personal Digital Assistants.

Rijoy K.J.



DESKTOP COMPUTERS

- Most widely used personal computers.



DESKTOP COMPUTERS

- Most widely used personal computers.
- Durable and cheap.



DESKTOP COMPUTERS

- Most widely used personal computers.
- Durable and cheap.
- Used in middle class Indian homes, cyber cafes, shopping malls, offices, etc.



DESKTOP COMPUTERS

- Most widely used personal computers.
- Durable and cheap.
- Used in middle class Indian homes, cyber cafes, shopping malls, offices, etc.
- They contain the following parts:



DESKTOP COMPUTERS

- Most widely used personal computers.
- Durable and cheap.
- Used in middle class Indian homes, cyber cafes, shopping malls, offices, etc.
- They contain the following parts:
 - A VDU.



DESKTOP COMPUTERS

- Most widely used personal computers.
- Durable and cheap.
- Used in middle class Indian homes, cyber cafes, shopping malls, offices, etc.
- They contain the following parts:
 - A VDU.
 - keyboard.



DESKTOP COMPUTERS

- Most widely used personal computers.
- Durable and cheap.
- Used in middle class Indian homes, cyber cafes, shopping malls, offices, etc.
- They contain the following parts:
 - A VDU.
 - keyboard.
 - CPU



DESKTOP COMPUTERS

- Most widely used personal computers.
- Durable and cheap.
- Used in middle class Indian homes, cyber cafes, shopping malls, offices, etc.
- They contain the following parts:
 - A VDU.
 - keyboard.
 - CPU
 - Mouse



DESKTOP COMPUTERS

- Most widely used personal computers.
- Durable and cheap.
- Used in middle class Indian homes, cyber cafes, shopping malls, offices, etc.
- They contain the following parts:
 - A VDU.
 - keyboard.
 - CPU
 - Mouse
 - There may be additional attachments like sound box, web cam, joy stick etc.



DESKTOP COMPUTERS

- Most widely used personal computers.
- Durable and cheap.
- Used in middle class Indian homes, cyber cafes, shopping malls, offices, etc.
- They contain the following parts:
 - A VDU.
 - keyboard.
 - CPU
 - Mouse
 - There may be additional attachments like sound box, web cam, joy stick etc.



WORK STATIONS

Rij



WORK STATIONS

- Workstations are powerful PCs used by engineers scientists, and other professionals.



WORK STATIONS

- Workstations are powerful PCs used by engineers scientists, and other professionals.
- They are expensive computers used to run complex programs and display both work progress and results graphically.



WORK STATIONS

- Workstations are powerful PCs used by engineers scientists, and other professionals.
- They are expensive computers used to run complex programs and display both work progress and results graphically.
- Uses Complex OSs like UNIX.



WORK STATIONS

- Workstations are powerful PCs used by engineers scientists, and other professionals.
- They are expensive computers used to run complex programs and display both work progress and results graphically.
- Uses Complex OSs like UNIX.
- Any work can be better performed by Workstations than ordinary PCs.



WORK STATIONS

- Workstations are powerful PCs used by engineers scientists, and other professionals.
- They are expensive computers used to run complex programs and display both work progress and results graphically.
- Uses Complex OSs like UNIX.
- Any work can be better performed by Workstations than ordinary PCs.



PORTABLE COMPUTERS

Rijoy



PORTABLE COMPUTERS

- PCs with miniature size is known as so.
- Nowadays computers become more and more portable but becomes more and more powerful.

Rijoy



PORTABLE COMPUTERS

- PCs with miniature size is known as so.
- Nowadays computers become more and more portable but becomes more and more powerful.
- They can be easily carried around.

Rijoy



PORTABLE COMPUTERS

- PCs with miniature size is known as so.
- Nowadays computers become more and more portable but becomes more and more powerful.
- They can be easily carried around.

There are three type of portable personal computers.

Rijoy



PORTABLE COMPUTERS

- PCs with miniature size is known as so.
- Nowadays computers become more and more portable but becomes more and more powerful.
- They can be easily carried around.

There are three type of portable personal computers.

- 1 Lap tops or Notebooks

Rijoy



PORTABLE COMPUTERS

- PCs with miniature size is known as so.
- Nowadays computers become more and more portable but becomes more and more powerful.
- They can be easily carried around.

There are three type of portable personal computers.

- 1 Lap tops or Notebooks
- 2 Tablet PCs

Rijoy



PORTABLE COMPUTERS

- PCs with miniature size is known as so.
- Nowadays computers become more and more portable but becomes more and more powerful.
- They can be easily carried around.

There are three type of portable personal computers.

- 1 Lap tops or Notebooks
- 2 Tablet PCs
- 3 Personal Digital Computers.



PORTABLE COMPUTERS

- PCs with miniature size is known as so.
- Nowadays computers become more and more portable but becomes more and more powerful.
- They can be easily carried around.

There are three type of portable personal computers.

- 1 Lap tops or Notebooks
- 2 Tablet PCs
- 3 Personal Digital Computers.



LAPTOPS OR NOTEBOOKS

Rijoy



LAPTOPS OR NOTEBOOKS

- Computers that can be operated either with AC or with a battery.

Rijoy



LAPTOPS OR NOTEBOOKS

- Computers that can be operated either with AC or with a battery.
- Used by people who have to work away from office.

Rijoy



LAPTOPS OR NOTEBOOKS

- Computers that can be operated either with AC or with a battery.
- Used by people who have to work away from office.
- These computers combine the power of PC with mobility.

Rijoy



LAPTOPS OR NOTEBOOKS

- Computers that can be operated either with AC or with a battery.
- Used by people who have to work away from office.
- These computers combine the power of PC with mobility.
- Used by executives, students, journalists, etc.

TABLET PC



LAPTOPS OR NOTEBOOKS

- Computers that can be operated either with AC or with a battery.
- Used by people who have to work away from office.
- These computers combine the power of PC with mobility.
- Used by executives, students, journalists, etc.

TABLET PC

- 1 Slate or notebook shaped mobile computers.



LAPTOPS OR NOTEBOOKS

- Computers that can be operated either with AC or with a battery.
- Used by people who have to work away from office.
- These computers combine the power of PC with mobility.
- Used by executives, students, journalists, etc.

TABLET PC

- 1 Slate or notebook shaped mobile computers.
- 2 Uses hybrid technology for input, like touch screen, stylus, etc.



LAPTOPS OR NOTEBOOKS

- Computers that can be operated either with AC or with a battery.
- Used by people who have to work away from office.
- These computers combine the power of PC with mobility.
- Used by executives, students, journalists, etc.

TABLET PC

- 1 Slate or notebook shaped mobile computers.
- 2 Uses hybrid technology for input, like touch screen, stylus, etc.
- 3 In modern Tablet PCs there are multi touch gestures, wi-fi capabilities, built in camera, etc.



LAPTOPS OR NOTEBOOKS

- Computers that can be operated either with AC or with a battery.
- Used by people who have to work away from office.
- These computers combine the power of PC with mobility.
- Used by executives, students, journalists, etc.

TABLET PC

- 1 Slate or notebook shaped mobile computers.
- 2 Uses hybrid technology for input, like touch screen, stylus, etc.
- 3 In modern Tablet PCs there are multi touch gestures, wi-fi capabilities, built in camera, etc.



PDAs

Rijc



PDAs

- Smaller than sub notebooks



PDAs

- Smaller than sub notebooks
- They combine pen input, writing recognition, personal organization tools and communication capabilities.



PDAs

- Smaller than sub notebooks
- They combine pen input, writing recognition, personal organization tools and communication capabilities.
- Used by executives for their day today activities.



PDAs

- Smaller than sub notebooks
- They combine pen input, writing recognition, personal organization tools and communication capabilities.
- Used by executives for their day today activities.



BASIC STRUCTURE OF A COMPUTER

Modern personal computers requires three basic components to process data. They are:

Rijoy K.J.



BASIC STRUCTURE OF A COMPUTER

Modern personal computers requires three basic components to process data. They are:

- 1 Input Devices.

Rijoy K.J.



BASIC STRUCTURE OF A COMPUTER

Modern personal computers requires three basic components to process data. They are:

- 1 Input Devices.
- 2 Central Processing Unit(CPU) which can be further divided into :

Rijoy K J



BASIC STRUCTURE OF A COMPUTER

Modern personal computers requires three basic components to process data. They are:

- ① Input Devices.
- ② Central Processing Unit(CPU) which can be further divided into :
 - ① Arithmetic Logic Unit.

Rijoy K J



BASIC STRUCTURE OF A COMPUTER

Modern personal computers requires three basic components to process data. They are:

- ① Input Devices.
- ② Central Processing Unit(CPU) which can be further divided into :
 - ① Arithmetic Logic Unit.
 - ② Control Unit.



BASIC STRUCTURE OF A COMPUTER

Modern personal computers requires three basic components to process data. They are:

- ① Input Devices.
- ② Central Processing Unit(CPU) which can be further divided into :
 - ① Arithmetic Logic Unit.
 - ② Control Unit.
 - ③ Memory or Storage Unit.



BASIC STRUCTURE OF A COMPUTER

Modern personal computers requires three basic components to process data. They are:

- 1 Input Devices.
- 2 Central Processing Unit(CPU) which can be further divided into :
 - 1 Arithmetic Logic Unit.
 - 2 Control Unit.
 - 3 Memory or Storage Unit.
- 3 Output Devices.



BASIC STRUCTURE OF A COMPUTER

Modern personal computers requires three basic components to process data. They are:

- 1 Input Devices.
- 2 Central Processing Unit(CPU) which can be further divided into :
 - 1 Arithmetic Logic Unit.
 - 2 Control Unit.
 - 3 Memory or Storage Unit.
- 3 Output Devices.



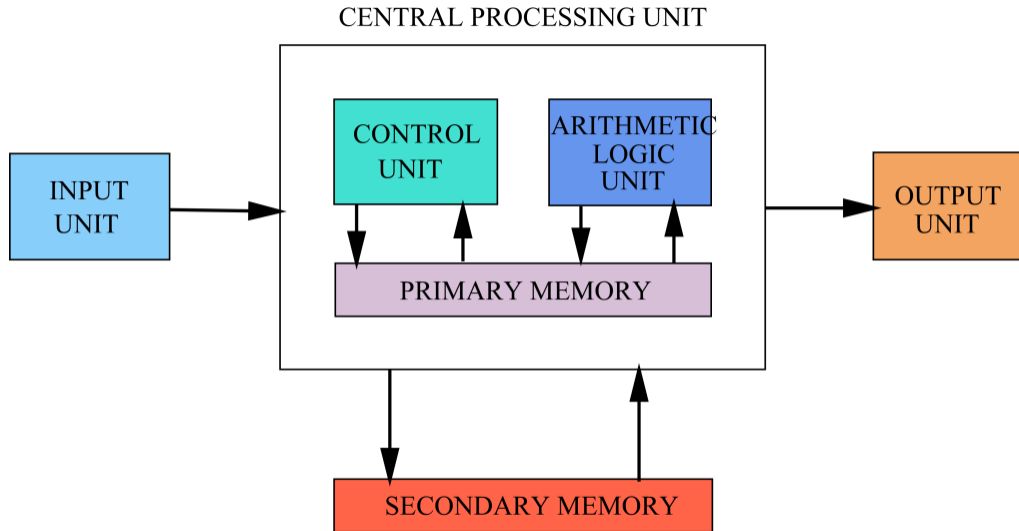


FIGURE: Basic Structure of a Computer



STRUCTURE - CONTD..

1. INPUT DEVICES

Rijoy



STRUCTURE - CONTD..

1. INPUT DEVICES

- Used to read the necessary data into the computer.

Rijoy



STRUCTURE - CONTD..

1. INPUT DEVICES

- Used to read the necessary data into the computer.
- Converts input data into a form acceptable to a computer.

Rijoy



STRUCTURE - CONTD..

1. INPUT DEVICES

- Used to read the necessary data into the computer.
- Converts input data into a form acceptable to a computer.
- Analogous to the five senses of humans.

Rijoy



STRUCTURE - CONTD..

1. INPUT DEVICES

- Used to read the necessary data into the computer.
- Converts input data into a form acceptable to a computer.
- Analogous to the five senses of humans.

E.g. keyboard, mouse, joystick, web cam, etc.

Rijoy



STRUCTURE - CONTD..

1. INPUT DEVICES

- Used to read the necessary data into the computer.
- Converts input data into a form acceptable to a computer.
- Analogous to the five senses of humans.

E.g. keyboard, mouse, joystick, web cam, etc.

2. CENTRAL PROCESSING UNIT

- CPU is the brain of any computer system.

STRUCTURE - CONTD..

1. INPUT DEVICES

- Used to read the necessary data into the computer.
- Converts input data into a form acceptable to a computer.
- Analogous to the five senses of humans.

E.g. keyboard, mouse, joystick, web cam, etc.

2. CENTRAL PROCESSING UNIT

- CPU is the brain of any computer system.
- It controls the operation of all other components like input devices, output devices, memory units, connected to the computer.

STRUCTURE - CONTD..

1. INPUT DEVICES

- Used to read the necessary data into the computer.
- Converts input data into a form acceptable to a computer.
- Analogous to the five senses of humans.

E.g. keyboard, mouse, joystick, web cam, etc.

2. CENTRAL PROCESSING UNIT

- CPU is the brain of any computer system.
- It controls the operation of all other components like input devices, output devices, memory units, connected to the computer.
- It provides necessary instructions to all other components attached to the computer.

STRUCTURE - CONTD..

1. INPUT DEVICES

- Used to read the necessary data into the computer.
- Converts input data into a form acceptable to a computer.
- Analogous to the five senses of humans.

E.g. keyboard, mouse, joystick, web cam, etc.

2. CENTRAL PROCESSING UNIT

- CPU is the brain of any computer system.
- It controls the operation of all other components like input devices, output devices, memory units, connected to the computer.
- It provides necessary instructions to all other components attached to the computer.

CPU - COMPONENTS

2A. ALU (ARITHMETIC LOGIC UNIT)

CPU - COMPONENTS

2A. ALU (ARITHMETIC LOGIC UNIT)

Most CPUs cannot manipulate data directly in primary memory. The computation like addition, subtraction, multiplication and division and logical operations must be performed in a separate section of the CPU called the Arithmetic Logic Unit(ALU).

CPU - COMPONENTS

2A. ALU (ARITHMETIC LOGIC UNIT)

Most CPUs cannot manipulate data directly in primary memory. The computation like addition, subtraction, multiplication and division and logical operations must be performed in a separate section of the CPU called the Arithmetic Logic Unit(ALU).

- ALU performs its tasks with special storage locations called 'Registers'.

CPU - COMPONENTS

2A. ALU (ARITHMETIC LOGIC UNIT)

Most CPUs cannot manipulate data directly in primary memory. The computation like addition, subtraction, multiplication and division and logical operations must be performed in a separate section of the CPU called the Arithmetic Logic Unit(ALU).

- ALU performs its tasks with special storage locations called 'Registers'.
- The control unit directs the operation of ALU.

CPU - COMPONENTS

2A. ALU (ARITHMETIC LOGIC UNIT)

Most CPUs cannot manipulate data directly in primary memory. The computation like addition, subtraction, multiplication and division and logical operations must be performed in a separate section of the CPU called the Arithmetic Logic Unit(ALU).

- ALU performs its tasks with special storage locations called 'Registers'.
- The control unit directs the operation of ALU.
- It performs both arithmetic operations and logical operations like comparison of two numbers.

CPU - COMPONENTS

2A. ALU (ARITHMETIC LOGIC UNIT)

Most CPUs cannot manipulate data directly in primary memory. The computation like addition, subtraction, multiplication and division and logical operations must be performed in a separate section of the CPU called the Arithmetic Logic Unit(ALU).

- ALU performs its tasks with special storage locations called 'Registers'.
- The control unit directs the operation of ALU.
- It performs both arithmetic operations and logical operations like comparison of two numbers.
- While performing a task, the data should be transferred from primary memory to ALU's register. The results are transferred from 'register' of ALU to main memory and then given to output devices.

CPU - COMPONENTS

2A. ALU (ARITHMETIC LOGIC UNIT)

Most CPUs cannot manipulate data directly in primary memory. The computation like addition, subtraction, multiplication and division and logical operations must be performed in a separate section of the CPU called the Arithmetic Logic Unit(ALU).

- ALU performs its tasks with special storage locations called 'Registers'.
- The control unit directs the operation of ALU.
- It performs both arithmetic operations and logical operations like comparison of two numbers.
- While performing a task, the data should be transferred from primary memory to ALU's register. The results are transferred from 'register' of ALU to main memory and then given to output devices.

CPU COMPONENTS

2B. CONTROL UNIT

CPU COMPONENTS

2B. CONTROL UNIT

- Control unit directs and coordinates all operations of a computer as per the instruction given to it.

CPU COMPONENTS

2B. CONTROL UNIT

- Control unit directs and coordinates all operations of a computer as per the instruction given to it.
- It is responsible for interpreting computer instructions and supervising their execution.

CPU COMPONENTS

2B. CONTROL UNIT

- Control unit directs and coordinates all operations of a computer as per the instruction given to it.
- It is responsible for interpreting computer instructions and supervising their execution.
- This reads instructions from primary memory and stores them temporarily in an instruction register.

CPU COMPONENTS

2B. CONTROL UNIT

- Control unit directs and coordinates all operations of a computer as per the instruction given to it.
- It is responsible for interpreting computer instructions and supervising their execution.
- This reads instructions from primary memory and stores them temporarily in an instruction register.
- It controls input units, output units, ALU, transferring data to and from storage and ALU.

CPU COMPONENTS

2B. CONTROL UNIT

- Control unit directs and coordinates all operations of a computer as per the instruction given to it.
- It is responsible for interpreting computer instructions and supervising their execution.
- This reads instructions from primary memory and stores them temporarily in an instruction register.
- It controls input units, output units, ALU, transferring data to and from storage and ALU.
- In data processing data is first read into primary memory, computations and logical operations are done by ALU and control unit and output is produced on output devices.

CPU COMPONENTS

2B. CONTROL UNIT

- Control unit directs and coordinates all operations of a computer as per the instruction given to it.
- It is responsible for interpreting computer instructions and supervising their execution.
- This reads instructions from primary memory and stores them temporarily in an instruction register.
- It controls input units, output units, ALU, transferring data to and from storage and ALU.
- In data processing data is first read into primary memory, computations and logical operations are done by ALU and control unit and output is produced on output devices.

CPU - PARTS

2C. MEMORY OR STORAGE UNIT

Rijoy



CPU - PARTS

2C. MEMORY OR STORAGE UNIT

There are two types of Memory units.

Rijoy



CPU - PARTS

2C. MEMORY OR STORAGE UNIT

There are two types of Memory units.

- 1 Primary or Main Memory(Internal memory).

Rijoy



CPU - PARTS

2C. MEMORY OR STORAGE UNIT

There are two types of Memory units.

- 1 Primary or Main Memory(Internal memory).
- 2 Secondary or Additional memory(External or Expandable memory).

Rijoy



CPU - PARTS

2C. MEMORY OR STORAGE UNIT

There are two types of Memory units.

- 1 Primary or Main Memory(Internal memory).
- 2 Secondary or Additional memory(External or Expandable memory).

PRIMARY MEMORY

- The memory unit of a computer is used to store data, programs, intermediate and final results.

CPU - PARTS

2C. MEMORY OR STORAGE UNIT

There are two types of Memory units.

- 1 Primary or Main Memory(Internal memory).
- 2 Secondary or Additional memory(External or Expandable memory).

PRIMARY MEMORY

- The memory unit of a computer is used to store data, programs, intermediate and final results.
- All data and programs must be placed in the primary memory before they can be used in processing.

CPU - PARTS

2C. MEMORY OR STORAGE UNIT

There are two types of Memory units.

- 1 Primary or Main Memory(Internal memory).
- 2 Secondary or Additional memory(External or Expandable memory).

PRIMARY MEMORY

- The memory unit of a computer is used to store data, programs, intermediate and final results.
- All data and programs must be placed in the primary memory before they can be used in processing.
- The primary storage unit is also used to store data and program instruction between processing steps and after processing is completed but before output is produced.

CPU - PARTS

2C. MEMORY OR STORAGE UNIT

There are two types of Memory units.

- 1 Primary or Main Memory(Internal memory).
- 2 Secondary or Additional memory(External or Expandable memory).

PRIMARY MEMORY

- The memory unit of a computer is used to store data, programs, intermediate and final results.
- All data and programs must be placed in the primary memory before they can be used in processing.
- The primary storage unit is also used to store data and program instruction between processing steps and after processing is completed but before output is produced.

PRIMARY MEMORY - CONTD...

Rijoy K



PRIMARY MEMORY - CONTD...

- Primary or main memory is a fast memory and it is the part of the computer.

Rijoy K



PRIMARY MEMORY - CONTD...

- Primary or main memory is a fast memory and it is the part of the computer.
- In addition to the data and program, it also stores program of system software which are required to execute the users program.

Rijoy K



PRIMARY MEMORY - CONTD...

- Primary or main memory is a fast memory and it is the part of the computer.
- In addition to the data and program, it also stores program of system software which are required to execute the users program.

SECONDARY MEMORY

- It is the additional memory attached to a computer system.

PRIMARY MEMORY - CONTD...

- Primary or main memory is a fast memory and it is the part of the computer.
- In addition to the data and program, it also stores program of system software which are required to execute the users program.

SECONDARY MEMORY

- It is the additional memory attached to a computer system.
- Data and programs are also stored in these type of storage.

PRIMARY MEMORY - CONTD...

- Primary or main memory is a fast memory and it is the part of the computer.
- In addition to the data and program, it also stores program of system software which are required to execute the users program.

SECONDARY MEMORY

- It is the additional memory attached to a computer system.
- Data and programs are also stored in these type of storage.
- The space available in the primary memory is limited and this secondary memory forms a supporting role to the primary storage in storing data and programs.

PRIMARY MEMORY - CONTD...

- Primary or main memory is a fast memory and it is the part of the computer.
- In addition to the data and program, it also stores program of system software which are required to execute the users program.

SECONDARY MEMORY

- It is the additional memory attached to a computer system.
- Data and programs are also stored in these type of storage.
- The space available in the primary memory is limited and this secondary memory forms a supporting role to the primary storage in storing data and programs.
- The data stored in secondary memory cannot be processed without being transferred to the primary memory.

PRIMARY MEMORY - CONTD...

- Primary or main memory is a fast memory and it is the part of the computer.
- In addition to the data and program, it also stores program of system software which are required to execute the users program.

SECONDARY MEMORY

- It is the additional memory attached to a computer system.
- Data and programs are also stored in these type of storage.
- The space available in the primary memory is limited and this secondary memory forms a supporting role to the primary storage in storing data and programs.
- The data stored in secondary memory cannot be processed without being transferred to the primary memory.

E.g. magnetic disks, tape units, flash drives, etc.

PRIMARY MEMORY - CONTD...

- Primary or main memory is a fast memory and it is the part of the computer.
- In addition to the data and program, it also stores program of system software which are required to execute the users program.

SECONDARY MEMORY

- It is the additional memory attached to a computer system.
- Data and programs are also stored in these type of storage.
- The space available in the primary memory is limited and this secondary memory forms a supporting role to the primary storage in storing data and programs.
- The data stored in secondary memory cannot be processed without being transferred to the primary memory.

E.g. magnetic disks, tape units, flash drives, etc.

STRUCTURE - CONTD..

3. OUTPUT DEVICES

- Output devices show the results of processed data.

Rijoy



STRUCTURE - CONTD..

3. OUTPUT DEVICES

- Output devices show the results of processed data.
- They are used to record the results obtained from computing or processing and present them to the user.

Rijoy



STRUCTURE - CONTD..

3. OUTPUT DEVICES

- Output devices show the results of processed data.
- They are used to record the results obtained from computing or processing and present them to the user.

A computer system consists of two major category of components.



STRUCTURE - CONTD..

3. OUTPUT DEVICES

- Output devices show the results of processed data.
- They are used to record the results obtained from computing or processing and present them to the user.

A computer system consists of two major category of components.

- Hardware and

STRUCTURE - CONTD..

3. OUTPUT DEVICES

- Output devices show the results of processed data.
- They are used to record the results obtained from computing or processing and present them to the user.

A computer system consists of two major category of components.

- Hardware and
- Software.

STRUCTURE - CONTD..

3. OUTPUT DEVICES

- Output devices show the results of processed data.
- They are used to record the results obtained from computing or processing and present them to the user.

A computer system consists of two major category of components.

- Hardware and
- Software.

Both hardware and software are necessary to operate a computer. They taken together form a computer system.

FEATURES OF PERSONAL COMPUTERS

- ① Speed of Operation :- Modern computers are much faster and hence they can perform very complex calculations very fast. i.e at the speed of electricity. a powerful computer can perform 3 million calculations per second or greater.

Rijoy W J



FEATURES OF PERSONAL COMPUTERS

- 1 Speed of Operation :- Modern computers are much faster and hence they can perform very complex calculations very fast. i.e at the speed of electricity. a powerful computer can perform 3 million calculations per second or greater.
- 2 Accuracy :- Computers are very accurate in processing data. The accuracy of information is directly depend on the accuracy of the data entered and the instructions given. If wrong input is given, the output also will be wrong. This is termed as "GIGO". i.e garbage in garbage out.



FEATURES OF PERSONAL COMPUTERS

- 1 Speed of Operation :- Modern computers are much faster and hence they can perform very complex calculations very fast. i.e at the speed of electricity. a powerful computer can perform 3 million calculations per second or greater.
- 2 Accuracy :- Computers are very accurate in processing data. The accuracy of information is directly depend on the accuracy of the data entered and the instructions given. If wrong input is given, the output also will be wrong. This is termed as "GIGO". i.e garbage in garbage out.
- 3 Storage :- Another important characteristic of a computer is its storage capacity. Computers have the capacity to store large volumes of data and instructions and can retrieve it as and when we require it. The storage capacity of the CPU is limited, but with the help of secondary storage, we can increase the storage capacity of a computer up to Terra Bytes.



FEATURES OF PERSONAL COMPUTERS

- ➊ Versatility :- Modern computers can be used for a wide variety of purposes.

Rijoy K.J.



FEATURES OF PERSONAL COMPUTERS

- ④ Versatility :- Modern computers can be used for a wide variety of purposes.
 - ① Scientific and business purposes.

Rijoy K.J.



FEATURES OF PERSONAL COMPUTERS

- ④ Versatility :- Modern computers can be used for a wide variety of purposes.
 - ① Scientific and business purposes.
 - ② Used for batch processing, on-line processing, and multiprogramming.

Rijoy K J



FEATURES OF PERSONAL COMPUTERS

- ④ Versatility :- Modern computers can be used for a wide variety of purposes.
 - ① Scientific and business purposes.
 - ② Used for batch processing, on-line processing, and multiprogramming.
 - ③ By means of computer networks computers can communicate with other computers and receive and send data in various forms like text, sound, graphics, etc.



FEATURES OF PERSONAL COMPUTERS

- ④ Versatility :- Modern computers can be used for a wide variety of purposes.
 - ① Scientific and business purposes.
 - ② Used for batch processing, on-line processing, and multiprogramming.
 - ③ By means of computer networks computers can communicate with other computers and receive and send data in various forms like text, sound, graphics, etc.

These tasks can be executed at the same time.



FEATURES OF PERSONAL COMPUTERS

- ④ Versatility :- Modern computers can be used for a wide variety of purposes.
 - ① Scientific and business purposes.
 - ② Used for batch processing, on-line processing, and multiprogramming.
 - ③ By means of computer networks computers can communicate with other computers and receive and send data in various forms like text, sound, graphics, etc.

These tasks can be executed at the same time.

- ⑤ Automatic operation :-Both hardware and software together makes computer a wonder machine that operates almost automatically unlike other machines which requires pressing of keys to start and stop.



FEATURES OF PERSONAL COMPUTERS

- ④ Versatility :- Modern computers can be used for a wide variety of purposes.
 - ① Scientific and business purposes.
 - ② Used for batch processing, on-line processing, and multiprogramming.
 - ③ By means of computer networks computers can communicate with other computers and receive and send data in various forms like text, sound, graphics, etc.

These tasks can be executed at the same time.

- ⑤ Automatic operation :-Both hardware and software together makes computer a wonder machine that operates almost automatically unlike other machines which requires pressing of keys to start and stop.



FEATURES OF PERSONAL COMPUTERS

- 6 Repetitiveness :- Unlike human beings, computer can work continuously for hours repetitively with the same speed and accuracy without any

Rijoy K.J



FEATURES OF PERSONAL COMPUTERS

- 6 Repetitiveness :- Unlike human beings, computer can work continuously for hours repetitively with the same speed and accuracy without any
- Fatigue.

Rijoy K.J



FEATURES OF PERSONAL COMPUTERS

- 6 Repetitiveness :- Unlike human beings, computer can work continuously for hours repetitively with the same speed and accuracy without any
- Fatigue.
 - Boredom.

Rijoy K.J



FEATURES OF PERSONAL COMPUTERS

- 6 Repetitiveness :- Unlike human beings, computer can work continuously for hours repetitively with the same speed and accuracy without any
- Fatigue.
 - Boredom.
 - Feeling of monotony.

Rijoy K.J



FEATURES OF PERSONAL COMPUTERS

- 6 Repetitiveness :- Unlike human beings, computer can work continuously for hours repetitively with the same speed and accuracy without any
- Fatigue.
 - Boredom.
 - Feeling of monotony.
 - Hesitation.

Rijoy K.J



FEATURES OF PERSONAL COMPUTERS

- 6 Repetitiveness :- Unlike human beings, computer can work continuously for hours repetitively with the same speed and accuracy without any
 - Fatigue.
 - Boredom.
 - Feeling of monotony.
 - Hesitation.
- 7 Complexity :- Some of the applications of the computers are very complex and it is impossible and impracticable to do the work manually.
Even a complex mathematical model can be analysed easily with the help of computers.
- 8 Computers are very reliable as human intervention is not necessary for undertaking processing operations.



HARDWARES

DEFINITION OF HARDWARE

All electronic, electrical, magnetic, and mechanical components used in computer systems are called hardware. In other words the term 'hard ware' refers to all physical and tangible things like machine, devices and other equipments connected with the computers that actually process data

Rijoy



HARDWARES

DEFINITION OF HARDWARE

All electronic, electrical, magnetic, and mechanical components used in computer systems are called hardware. In other words the term 'hard ware' refers to all physical and tangible things like machine, devices and other equipments connected with the computers that actually process data

TYPES OF HARDWARE

Hardware can be classified into Two :



HARDWARES

DEFINITION OF HARDWARE

All electronic, electrical, magnetic, and mechanical components used in computer systems are called hardware. In other words the term 'hard ware' refers to all physical and tangible things like machine, devices and other equipments connected with the computers that actually process data

TYPES OF HARDWARE

Hardware can be classified into Two :

- CPU.



HARDWARES

DEFINITION OF HARDWARE

All electronic, electrical, magnetic, and mechanical components used in computer systems are called hardware. In other words the term 'hard ware' refers to all physical and tangible things like machine, devices and other equipments connected with the computers that actually process data

TYPES OF HARDWARE

Hardware can be classified into Two :

- CPU.
- Peripherals(include both input and output units)



HARDWARES

A typical personal computer consists of the following hardware.

Rijoy K.J



HARDWARES

A typical personal computer consists of the following hardware.

- Computer Case(Cabinet) :- The main components are enclosed in computer case.

Rijoy K.J



HARDWARES

A typical personal computer consists of the following hardware.

- Computer Case(Cabinet) :- The main components are enclosed in computer case.
 - Usually built in steel or Aluminium.

Rijoy K.J



HARDWARES

A typical personal computer consists of the following hardware.

- Computer Case(Cabinet) :- The main components are enclosed in computer case.
 - Usually built in steel or Aluminium.
 - They come in different sizes.

Rijoy K.J



HARDWARES

A typical personal computer consists of the following hardware.

- Computer Case(Cabinet) :- The main components are enclosed in computer case.
 - Usually built in steel or Aluminium.
 - They come in different sizes.
 - The size is determined by the form factor of the mother board.

Rijoy



HARDWARES

A typical personal computer consists of the following hardware.

- Computer Case(Cabinet) :- The main components are enclosed in computer case.
 - Usually built in steel or Aluminium.
 - They come in different sizes.
 - The size is determined by the form factor of the mother board.
 - The most popular form factor is the ATX.

Rijoy K.J



HARDWARES

A typical personal computer consists of the following hardware.

- Computer Case(Cabinet) :- The main components are enclosed in computer case.
 - Usually built in steel or Aluminium.
 - They come in different sizes.
 - The size is determined by the form factor of the mother board.
 - The most popular form factor is the ATX.



HARDWARES - CPU

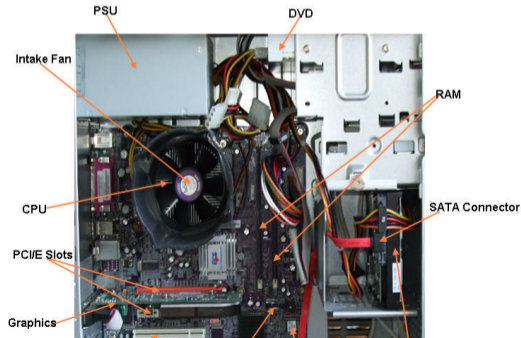
- Central Processing Unit (CPU) :- The part of computer which executes instructions given to it in the form of programs.
In this part, most of the hardware components like, mother board, HDD, disk drives, power supply, etc. are connected.

Rijoy



HARDWARES - CPU

- Central Processing Unit (CPU) :- The part of computer which executes instructions given to it in the form of programs.
In this part, most of the hardware components like, mother board, HDD, disk drives, power supply, etc. are connected.



HARDWARES-MOTHER BOARD

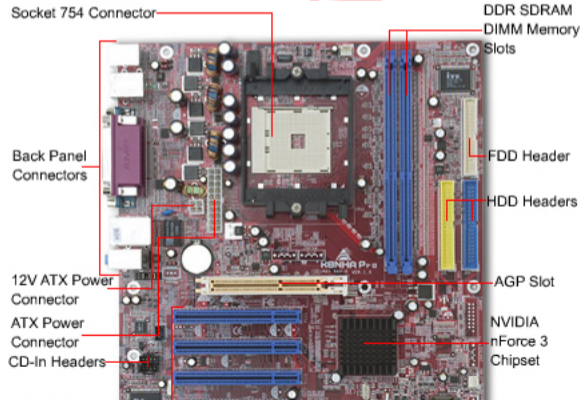
Mother board is the primary and large circuit board to which many other components are directly or indirectly connected. Also it provides provision for connecting supporting circuitry.

Rijoy K.J

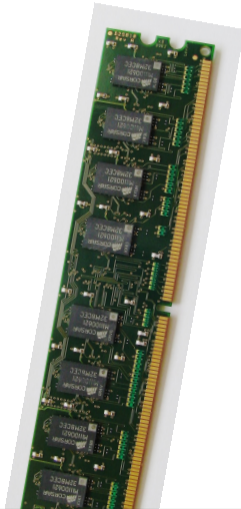


HARDWARES-MOTHER BOARD

Mother board is the primary and large circuit board to which many other components are directly or indirectly connected. Also it provides provision for connecting supporting circuitry.



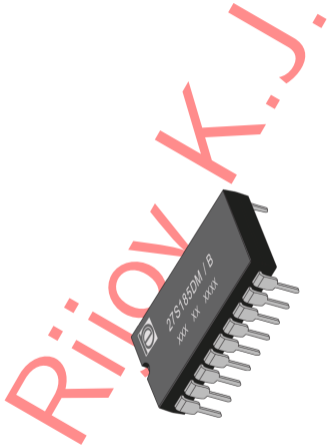
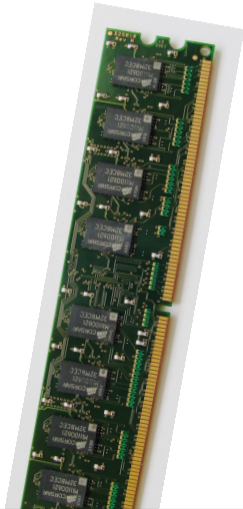
HARDWARES-MAIN MEMORY



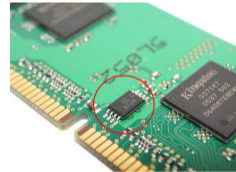
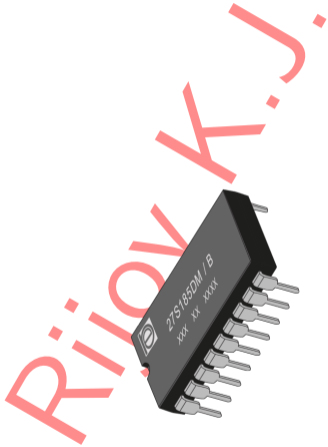
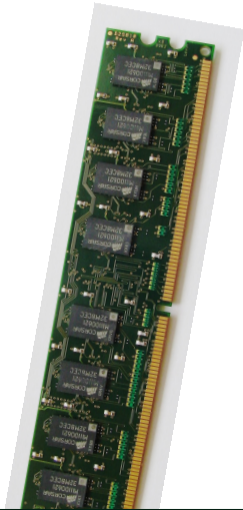
Rijoy K.J.



HARDWARES-MAIN MEMORY



HARDWARES-MAIN MEMORY



HARDWARE - MEMORY

An important component of computer is its memory. Two types of memory are available.

Rijoy K.J.



HARDWARE - MEMORY

An important component of computer is its memory. Two types of memory are available.

- 1 ROM :- Computers can read the data stored in ROM; but cannot write new data into it.

Rijoy V J



HARDWARE - MEMORY

An important component of computer is its memory. Two types of memory are available.

- 1 ROM :- Computers can read the data stored in ROM; but cannot write new data into it.
- 2 RAM :- With RAM computers can read from and write to that memory.

Rijoy V J



HARDWARE - MEMORY

An important component of computer is its memory. Two types of memory are available.

- 1 ROM :- Computers can read the data stored in ROM; but cannot write new data into it.
- 2 RAM :- With RAM computers can read from and write to that memory.

Many desktops has the capacity to add additional RAM by means of additional slots provided in the mother board.



HARDWARE - MEMORY

An important component of computer is its memory. Two types of memory are available.

- 1 ROM :- Computers can read the data stored in ROM; but cannot write new data into it.
- 2 RAM :- With RAM computers can read from and write to that memory.

Many desktops has the capacity to add additional RAM by means of additional slots provided in the mother board.

There is specific kind of ROM called BIOS (Basic Input/Output System). If CPU is the brain of the computer, BIOS is the spine. It is responsible for the interactions between software and hardware component of the system.

HARD DISK - CONTD...

The hard disk is direct access storage medium with a rigid magnetic disk.

Rijoy K.J.



HARD DISK - CONTD...

The hard disk is direct access storage medium with a rigid magnetic disk.

- The data stored as magnetised spots arranged in concentric circles(tracks) on the disk.

Rijoy K.J.



HARD DISK - CONTD...

The hard disk is direct access storage medium with a rigid magnetic disk.

- The data stored as magnetised spots arranged in concentric circles(tracks) on the disk.
- Each track is divided into sectors.
- The number of tracks and sectors on a disc are known as its 'format'.

Rijoy K J



HARD DISK - CONTD...

The hard disk is direct access storage medium with a rigid magnetic disk.

- The data stored as magnetised spots arranged in concentric circles(tracks) on the disk.
- Each track is divided into sectors.
- The number of tracks and sectors on a disc are known as its 'format'.
- High data rate demand that the disk rotates at a high speed(about 3'600 rpm).



HARD DISK - CONTD...

The hard disk is direct access storage medium with a rigid magnetic disk.

- The data stored as magnetised spots arranged in concentric circles(tracks) on the disk.
- Each track is divided into sectors.
- The number of tracks and sectors on a disc are known as its 'format'.
- High data rate demand that the disk rotates at a high speed(about 3'600 rpm).
- The disk is sealed and lubricated and the head hovers on a cushion of air just above the disk to avoid damage(hence known as floating heads).



HARD DISK - CONTD...

The hard disk is direct access storage medium with a rigid magnetic disk.

- The data stored as magnetised spots arranged in concentric circles(tracks) on the disk.
- Each track is divided into sectors.
- The number of tracks and sectors on a disc are known as its 'format'.
- High data rate demand that the disk rotates at a high speed(about 3'600 rpm).
- The disk is sealed and lubricated and the head hovers on a cushion of air just above the disk to avoid damage(hence known as floating heads).
- The storage capacity of a HDD is Terra bytes nowadays.



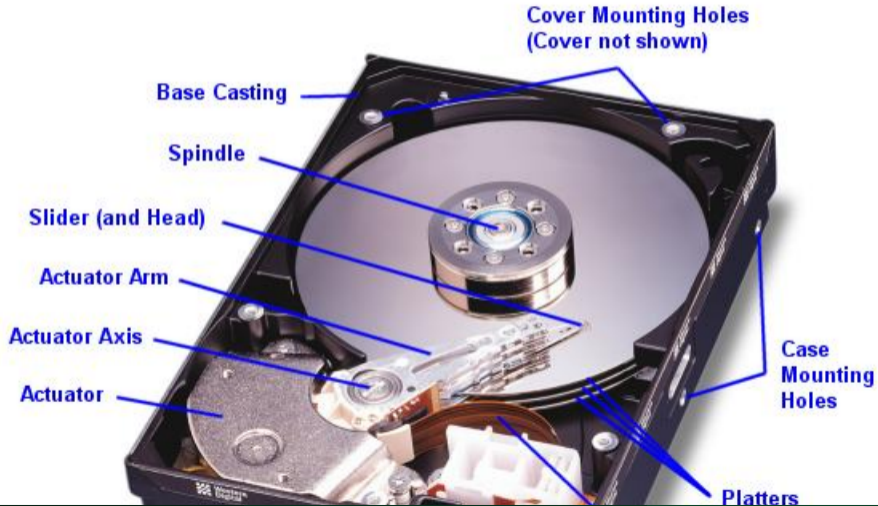
HARD DISK - CONTD...

The hard disk is direct access storage medium with a rigid magnetic disk.

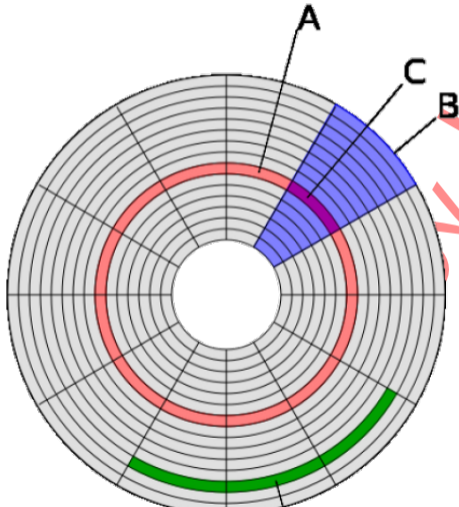
- The data stored as magnetised spots arranged in concentric circles(tracks) on the disk.
- Each track is divided into sectors.
- The number of tracks and sectors on a disc are known as its 'format'.
- High data rate demand that the disk rotates at a high speed(about 3'600 rpm).
- The disk is sealed and lubricated and the head hovers on a cushion of air just above the disk to avoid damage(hence known as floating heads).
- The storage capacity of a HDD is Terra bytes nowadays.



HARDWARE - HARD DISK



HARDWARE - HARD DISK



Hard Drive Structure:

A = track

B = sector

C = sector of a track

D = cluster



HARDWARES - VIDEO CARD

- In the old age, computers can handle only text informations and no graphics capabilities.

Rijoy K.J.



HARDWARES - VIDEO CARD

- In the old age, computers can handle only text informations and no graphics capabilities.
- The video card(graphics card) processes and transfers the graphics output from the computer to the monitor which is the part of modern computer.

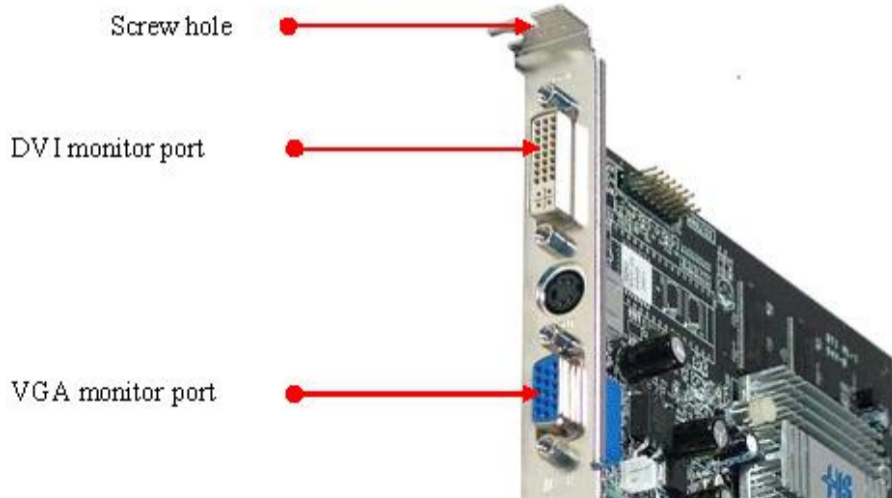


HARDWARES - VIDEO CARD

- In the old age, computers can handle only text informations and no graphics capabilities.
- The video card(graphics card) processes and transfers the graphics output from the computer to the monitor which is the part of modern computer.
- The graphics card is integrated to mother board through slots.



VIDEO CARD



HARDWARE - VDU

A monitor is a commonly and at the same time powerful output device which is used to see data, graphics, images and all other type of information.

Rijoy K.J



HARDWARE - VDU

A monitor is a commonly and at the same time powerful output device which is used to see data, graphics, images and all other type of information.

A visual display unit or a monitor is a piece of electrical equipment that displays viewable images generated by a computer without producing a permanent record.

Rijoy



HARDWARE - VDU

A monitor is a commonly and at the same time powerful output device which is used to see data, graphics, images and all other type of information.

A visual display unit or a monitor is a piece of electrical equipment that displays viewable images generated by a computer without producing a permanent record.



HARDWARE - CARD READER

Interchange of data such as photographs from digital cameras is made it possible by installation of a card reader.

Rijoy K.J



HARDWARE - CARD READER

Interchange of data such as photographs from digital cameras is made it possible by installation of a card reader.

It is faster and more convenient to move large amounts of data by removing the card from the mobile device, instead of communicating with a mobile device through a USB interface.

Rijoy



HARDWARE - CARD READER

Interchange of data such as photographs from digital cameras is made it possible by installation of a card reader.

It is faster and more convenient to move large amounts of data by removing the card from the mobile device, instead of communicating with a mobile device through a USB interface.



USB FLASH DRIVE

- A USB flash drive performs much of the data transfer and backup functions formerly done with floppy drives and other devices.

Rijoy K. J.



USB FLASH DRIVE

- A USB flash drive performs much of the data transfer and backup functions formerly done with floppy drives and other devices.
- Main stream current operating systems for personal computers provide standard support for flash drives, allowing interchange even between computers using different processors and operating systems.



USB FLASH DRIVE

- A USB flash drive performs much of the data transfer and backup functions formerly done with floppy drives and other devices.
- Main stream current operating systems for personal computers provide standard support for flash drives, allowing interchange even between computers using different processors and operating systems.
- The compact size and lack of moving parts or dirt sensitive media combined with low cost for high capacity, have made flash drives a popular and useful accessory for any personal computer user.



USB FLASH DRIVE

- A USB flash drive performs much of the data transfer and backup functions formerly done with floppy drives and other devices.
- Main stream current operating systems for personal computers provide standard support for flash drives, allowing interchange even between computers using different processors and operating systems.
- The compact size and lack of moving parts or dirt sensitive media combined with low cost for high capacity, have made flash drives a popular and useful accessory for any personal computer user.



OTHER DESIRABLE HARDWARE COMPONENTS

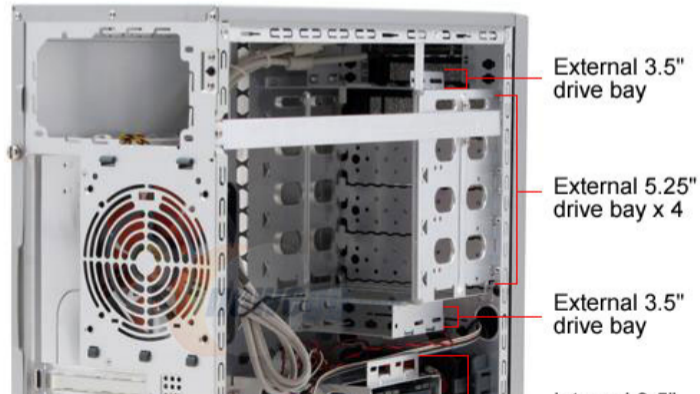
Drive Bays :- A drive bay is a standard sized area for adding hardware to a computer. Most drive bays are fixed to the inside of a case.

Rijoy K.J



OTHER DESIRABLE HARDWARE COMPONENTS

Drive Bays :- A drive bay is a standard sized area for adding hardware to a computer. Most drive bays are fixed to the inside of a case.



USES OF COMPUTERS

Nowadays computers are necessary for all walks of life right from earth to sky.
Important areas are:

Rijoy K.J



USES OF COMPUTERS

Nowadays computers are necessary for all walks of life right from earth to sky.

Important areas are:

- Education:- Computers have been important learning tools starting from kids to college students and research scholars.

Rijoy K J



USES OF COMPUTERS

Nowadays computers are necessary for all walks of life right from earth to sky.

Important areas are:

- Education:- Computers have been important learning tools starting from kids to college students and research scholars.
 - Medicine ; PET, MRI, etc.

Rijoy



USES OF COMPUTERS

Nowadays computers are necessary for all walks of life right from earth to sky.

Important areas are:

- Education:- Computers have been important learning tools starting from kids to college students and research scholars.
 - Medicine ; PET, MRI, etc.
 - Astronomy.

Rijoy



USES OF COMPUTERS

Nowadays computers are necessary for all walks of life right from earth to sky.

Important areas are:

- Education:- Computers have been important learning tools starting from kids to college students and research scholars.
 - Medicine ; PET, MRI, etc.
 - Astronomy.
 - Astrology.

Rijoy



USES OF COMPUTERS

Nowadays computers are necessary for all walks of life right from earth to sky.

Important areas are:

- Education:- Computers have been important learning tools starting from kids to college students and research scholars.
 - Medicine ; PET, MRI, etc.
 - Astronomy.
 - Astrology.
- Science :- All branches of science, from astronomy to zoology depend on computers. MRI, PET are other important applications which need computers.



USES OF COMPUTERS

Nowadays computers are necessary for all walks of life right from earth to sky.

Important areas are:

- Education:- Computers have been important learning tools starting from kids to college students and research scholars.
 - Medicine ; PET, MRI, etc.
 - Astronomy.
 - Astrology.
- Science :- All branches of science, from astronomy to zoology depend on computers. MRI, PET are other important applications which need computers.
- Communication :- Computers have changes the ways of communication. i.e. Internet, Email, etc. are examples.



USES OF COMPUTERS

Nowadays computers are necessary for all walks of life right from earth to sky.

Important areas are:

- Education:- Computers have been important learning tools starting from kids to college students and research scholars.
 - Medicine ; PET, MRI, etc.
 - Astronomy.
 - Astrology.
- Science :- All branches of science, from astronomy to zoology depend on computers. MRI, PET are other important applications which need computers.
- Communication :- Computers have changes the ways of communication. i.e. Internet, Email, etc. are examples.
- Business :- Computers has changed the way of doing business.i.e. on line business, etc.



USES OF COMPUTERS

Nowadays computers are necessary for all walks of life right from earth to sky.

Important areas are:

- Education:- Computers have been important learning tools starting from kids to college students and research scholars.
 - Medicine ; PET, MRI, etc.
 - Astronomy.
 - Astrology.
- Science :- All branches of science, from astronomy to zoology depend on computers. MRI, PET are other important applications which need computers.
- Communication :- Computers have changes the ways of communication. i.e. Internet, Email, etc. are examples.
- Business :- Computers has changed the way of doing business.i.e. on line business, etc.
- Government :- Government agencies and their databases are now interlinked,



TYPES OF MEMORY

STORAGE DEVICES

A storage device is used in the computers to store the data.

Rijoy K.J.



TYPES OF MEMORY

STORAGE DEVICES

A storage device is used in the computers to store the data.

It also provides one core function of the modern computers.



TYPES OF MEMORY

STORAGE DEVICES

A storage device is used in the computers to store the data.

It also provides one core function of the modern computers.

There are four types of storage devices

- Primary storage



TYPES OF MEMORY

STORAGE DEVICES

A storage device is used in the computers to store the data.

It also provides one core function of the modern computers.

There are four types of storage devices

- Primary storage
- Secondary storage



TYPES OF MEMORY

STORAGE DEVICES

A storage device is used in the computers to store the data.

It also provides one core function of the modern computers.

There are four types of storage devices

- Primary storage
- Secondary storage
- Tertiary storage



TYPES OF MEMORY

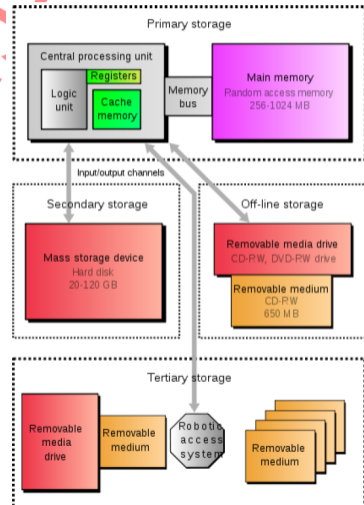
STORAGE DEVICES

A storage device is used in the computers to store the data.

It also provides one core function of the modern computers.

There are four types of storage devices

- Primary storage
- Secondary storage
- Tertiary storage
- Offline storage



PRIMARY STORAGE

- Primary Memory which is also known as Main memory, is directly or indirectly connected to central processing unit through memory BUS.

Rijoy K.J



PRIMARY STORAGE

- Primary Memory which is also known as Main memory, is directly or indirectly connected to central processing unit through memory BUS.
- The CPU continuously reads instructions stored there and executes them as required.

Rijoy K J



PRIMARY STORAGE

- Primary Memory which is also known as Main memory, is directly or indirectly connected to central processing unit through memory BUS.
- The CPU continuously reads instructions stored there and executes them as required.

EXAMPLE

- RAM
- ROM
- Cache

RAM(RANDOM ACCESS MEMORY)

It is called Random Access Memory because any of the data in RAM can be accessed just as fast as any of the other data.



PRIMARY STORAGE

- Primary Memory which is also known as Main memory, is directly or indirectly connected to central processing unit through memory BUS.
- The CPU continuously reads instructions stored there and executes them as required.

EXAMPLE

- RAM
- ROM
- Cache

RAM(RANDOM ACCESS MEMORY)

It is called Random Access Memory because any of the data in RAM can be accessed just as fast as any of the other data.

There are two types of RAM

- DRAM (Dynamic Random Access Memory)



PRIMARY STORAGE

- Primary Memory which is also known as Main memory, is directly or indirectly connected to central processing unit through memory BUS.
- The CPU continuously reads instructions stored there and executes them as required.

EXAMPLE

- RAM
- ROM
- Cache

RAM(RANDOM ACCESS MEMORY)

It is called Random Access Memory because any of the data in RAM can be accessed just as fast as any of the other data.

There are two types of RAM

- DRAM (Dynamic Random Access Memory)
- SRAM (Static Random Access Memory)



DIFFERENCE BETWEEN SRAM AND DRAM

Static RAM

Dynamic RAM

Rijoy K.J.



DIFFERENCE BETWEEN SRAM AND DRAM

Static RAM

1. Faster

Dynamic RAM

1. Slower

Rijoy K.



DIFFERENCE BETWEEN SRAM AND DRAM

Static RAM

1. Faster
2. More Expensive

Dynamic RAM

1. Slower
2. Less Expensive

Rijoy K



DIFFERENCE BETWEEN SRAM AND DRAM

Static RAM

1. Faster
2. More Expensive
3. More Power Consumption

Dynamic RAM

1. Slower
2. Less Expensive
3. Less power consumption

Rijoy



DIFFERENCE BETWEEN SRAM AND DRAM

Static RAM

1. Faster
2. More Expensive
3. More Power Consumption
4. Does not need to be refreshed

Dynamic RAM

1. Slower
2. Less Expensive
3. Less power consumption
4. Needs to be refreshed thousands of times per second.



ROM

ROM

- This memory is used as the computer begins to boot up.



ROM

ROM

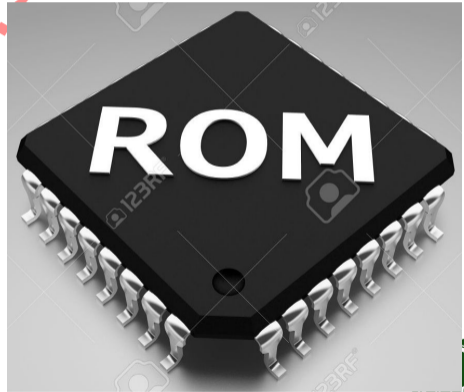
- This memory is used as the computer begins to boot up.
- Small programs called firmware are often stored in ROM chips on hardware devices (like a BIOS chip), and they contain instructions the computer can use in performing some of the most basic operations required to operate hardware devices.



ROM

ROM

- This memory is used as the computer begins to boot up.
- Small programs called firmware are often stored in ROM chips on hardware devices (like a BIOS chip), and they contain instructions the computer can use in performing some of the most basic operations required to operate hardware devices.
- ROM memory cannot be easily or quickly overwritten or modified.



CACHE MEMORY

CACHE

- Cache memory is a type of fast, relatively small memory that is stored on computer hardware.



CACHE MEMORY

CACHE

- Cache memory is a type of fast, relatively small memory that is stored on computer hardware.
- Cache is a high-speed access area that can be either a reserved section of main memory or a storage device.



CACHE MEMORY

CACHE

- Cache memory is a type of fast, relatively small memory that is stored on computer hardware.
- Cache is a high-speed access area that can be either a reserved section of main memory or a storage device.
- The purpose of cache memory is to store program instructions that are frequently used by software during its general operations, this is why fast access is needed as it helps to keep the program running quickly.



CACHE MEMORY

CACHE

- Cache memory is a type of fast, relatively small memory that is stored on computer hardware.
- Cache is a high-speed access area that can be either a reserved section of main memory or a storage device.
- The purpose of cache memory is to store program instructions that are frequently used by software during its general operations, this is why fast access is needed as it helps to keep the program running quickly.
- Most computers today come with a L3 or L2 cache while older computers included only L1 cache.



SECONDARY STORAGE

- Secondary memory is also termed as external memory and refers to the various storage media on which a computer can store data and programs.

Rijoy K.J.



SECONDARY STORAGE

- Secondary memory is also termed as external memory and refers to the various storage media on which a computer can store data and programs.
- The Secondary storage media can be fixed or removable.

Rijoy V



SECONDARY STORAGE

- Secondary memory is also termed as external memory and refers to the various storage media on which a computer can store data and programs.
- The Secondary storage media can be fixed or removable.
- Fixed Storage media is an internal storage medium like hard disk that is fixed inside the computer.

Rijoy



SECONDARY STORAGE

- Secondary memory is also termed as external memory and refers to the various storage media on which a computer can store data and programs.
- The Secondary storage media can be fixed or removable.
- Fixed Storage media is an internal storage medium like hard disk that is fixed inside the computer.
- It is not directly accessible by the CPU.

Rijoy



SECONDARY STORAGE

- Secondary memory is also termed as external memory and refers to the various storage media on which a computer can store data and programs.
- The Secondary storage media can be fixed or removable.
- Fixed Storage media is an internal storage medium like hard disk that is fixed inside the computer.
- It is not directly accessible by the CPU.
- Computer usually uses its input/output channels to access secondary storage and transfers the desired data using intermediate area in primary storage.



SECONDARY STORAGE

- Secondary memory is also termed as external memory and refers to the various storage media on which a computer can store data and programs.
- The Secondary storage media can be fixed or removable.
- Fixed Storage media is an internal storage medium like hard disk that is fixed inside the computer.
- It is not directly accessible by the CPU.
- Computer usually uses its input/output channels to access secondary storage and transfers the desired data using intermediate area in primary storage.

EXAMPLE

Hard Disk(Internal and External), Floppy Disc, Flash Drives, etc.

HARD DISK

- The hard disk drive is the main, and usually largest, data storage device in a computer.



HARD DISK

- The hard disk drive is the main, and usually largest, data storage device in a computer.
- It can store anywhere from 160 gigabytes to 2 terabytes.



HARD DISK

- The hard disk drive is the main, and usually largest, data storage device in a computer.
- It can store anywhere from 160 gigabytes to 2 terabytes.
- Hard disk speed is the speed at which content can be read and written on a hard disk.



HARD DISK

- The hard disk drive is the main, and usually largest, data storage device in a computer.
- It can store anywhere from 160 gigabytes to 2 terabytes.
- Hard disk speed is the speed at which content can be read and written on a hard disk.
- A hard disk unit comes with a set rotation speed varying from 4500 to 7200 rpm.



HARD DISK

- The hard disk drive is the main, and usually largest, data storage device in a computer.
- It can store anywhere from 160 gigabytes to 2 terabytes.
- Hard disk speed is the speed at which content can be read and written on a hard disk.
- A hard disk unit comes with a set rotation speed varying from 4500 to 7200 rpm.
- Disk access time is measured in milliseconds.



TERTIARY STORAGE

- Typically it involves a robotic mechanism which will mount(insert) and dismount removable mass storage media into a storage device.

Rijoy K.J.



TERTIARY STORAGE

- Typically it involves a robotic mechanism which will mount(insert) and dismount removable mass storage media into a storage device.
- It is a comprehensive computer storage system that is usually very slow, so it is usually used to archived at a that is not accessed frequently.

Rijoy V. J.



TERTIARY STORAGE

- Typically it involves a robotic mechanism which will mount(insert) and dismount removable mass storage media into a storage device.
- It is a comprehensive computer storage system that is usually very slow, so it is usually used to archived at a that is not accessed frequently.
- This is primarily useful for extraordinarily large data stores, accessed without human operators.



TERTIARY STORAGE

- Typically it involves a robotic mechanism which will mount(insert) and dismount removable mass storage media into a storage device.
- It is a comprehensive computer storage system that is usually very slow, so it is usually used to archived at a that is not accessed frequently.
- This is primarily useful for extraordinarily large data stores, accessed without human operators.

EXAMPLE

Magnetic tape, Optical disc, etc.



MAGNETIC TAPE

MAGNETIC TAPE

- A magnetically coated strip of plastic on which data can be encoded.
- Tapes for computers are similar to tapes used to store music.



MAGNETIC TAPE

MAGNETIC TAPE

- A magnetically coated strip of plastic on which data can be encoded.
- Tapes for computers are similar to tapes used to store music.
- Tape is much less expensive than other storage mediums but commonly a much slower solution that is commonly used for backup.



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

Rijoy K



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

The most common types of optical media are:

Rijoy



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

The most common types of optical media are:

- Compact Disc

Rijoy



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

The most common types of optical media are:

- Compact Disc
- Digital Versatile Disc (DVD)

Rijoy



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

The most common types of optical media are:

- Compact Disc
- Digital Versatile Disc (DVD)
- Blu Ray Disc

Rijoy



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

The most common types of optical media are:

- Compact Disc
- Digital Versatile Disc (DVD)
- Blu Ray Disc

Comparison between different Optical Discs are as follows:

CD	DVD	Blu-Ray
----	-----	---------



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

The most common types of optical media are:

- Compact Disc
- Digital Versatile Disc (DVD)
- Blu Ray Disc

Comparison between different Optical Discs are as follows:

	CD	DVD	Blu-Ray
1.Capacity	700 MB	4.7-17GB	50 GB



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

The most common types of optical media are:

- Compact Disc
- Digital Versatile Disc (DVD)
- Blu Ray Disc

Comparison between different Optical Discs are as follows:

	CD	DVD	Blu-Ray
1.Capacity	700 MB	4.7-17GB	50 GB
2.Wavelength	780nm	650 nm	405 nm



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

The most common types of optical media are:

- Compact Disc
- Digital Versatile Disc (DVD)
- Blu Ray Disc

Comparison between different Optical Discs are as follows:

	CD	DVD	Blu-Ray
1.Capacity	700 MB	4.7-17GB	50 GB
2.Wavelength	780nm	650 nm	405 nm
3. Read/Write Speed	1200 kB/s	10.5 MB/s	36 MB/s



OPTICAL DISC

Optical disc is any storage media that holds content in digital format and is read using a laser assembly is considered optical media.

The most common types of optical media are:

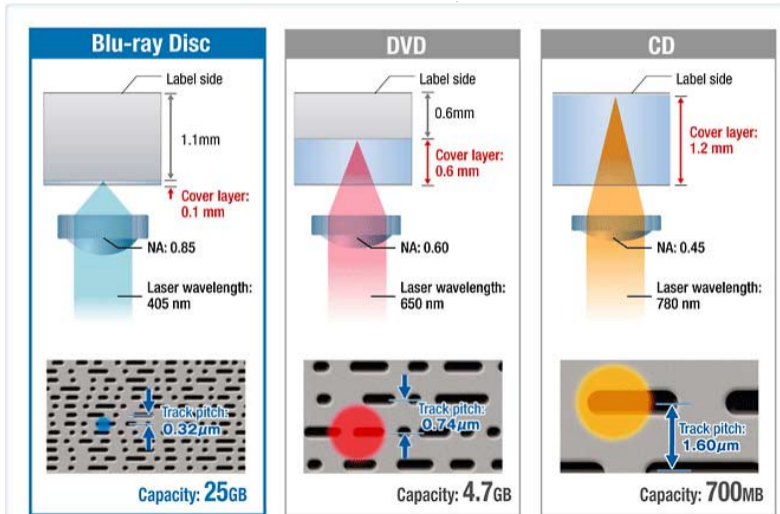
- Compact Disc
- Digital Versatile Disc (DVD)
- Blu Ray Disc

Comparison between different Optical Discs are as follows:

	CD	DVD	Blu-Ray
1.Capacity	700 MB	4.7-17GB	50 GB
2.Wavelength	780nm	650 nm	405 nm
3. Read/Write Speed	1200 kB/s	10.5 MB/s	36 MB/s



OPTICAL DISC WRITING PARAMETERS



OFFLINE STORAGE

- Also known as disconnected storage.

Rijoy K.J.



OFFLINE STORAGE

- Also known as disconnected storage.
- Is a computer data storage on a medium or a device that is not under the control of a processing unit.

Rijoy K.J.



OFFLINE STORAGE

- Also known as disconnected storage.
- Is a computer data storage on a medium or a device that is not under the control of a processing unit.
- It must be inserted or connected by a human operator before a computer can access it again.

Rijoy K.J.



OFFLINE STORAGE

- Also known as disconnected storage.
- Is a computer data storage on a medium or a device that is not under the control of a processing unit.
- It must be inserted or connected by a human operator before a computer can access it again.

EXAMPLE

- Floppy Disc.

OFFLINE STORAGE

- Also known as disconnected storage.
- Is a computer data storage on a medium or a device that is not under the control of a processing unit.
- It must be inserted or connected by a human operator before a computer can access it again.

EXAMPLE

- Floppy Disc.
- Zip Diskette

OFFLINE STORAGE

- Also known as disconnected storage.
- Is a computer data storage on a medium or a device that is not under the control of a processing unit.
- It must be inserted or connected by a human operator before a computer can access it again.

EXAMPLE

- Floppy Disc.
- Zip Diskette
- USB Flash Drive.

OFFLINE STORAGE

- Also known as disconnected storage.
- Is a computer data storage on a medium or a device that is not under the control of a processing unit.
- It must be inserted or connected by a human operator before a computer can access it again.

EXAMPLE

- Floppy Disc.
- Zip Diskette
- USB Flash Drive.
- Memory Card.

OFFLINE STORAGE

- Also known as disconnected storage.
- Is a computer data storage on a medium or a device that is not under the control of a processing unit.
- It must be inserted or connected by a human operator before a computer can access it again.

EXAMPLE

- Floppy Disc.
- Zip Diskette
- USB Flash Drive.
- Memory Card.

FLOPPY DISC

- A soft magnetic disk.



FLOPPY DISC

- A soft magnetic disk.
- Floppy disks are portable.



FLOPPY DISC

- A soft magnetic disk.
- Floppy disks are portable.
- Floppy disks are slower to access than hard disks and have less storage capacity, but they are much less expensive.



FLOPPY DISC

- A soft magnetic disk.
- Floppy disks are portable.
- Floppy disks are slower to access than hard disks and have less storage capacity, but they are much less expensive.
- Can store data upto 1.44MB.
- Two common sizes : $5\frac{1}{2}$ " and $3\frac{1}{2}$ ".



FLOPPY DISC

- A soft magnetic disk.
- Floppy disks are portable.
- Floppy disks are slower to access than hard disks and have less storage capacity, but they are much less expensive.
- Can store data upto 1.44MB.
- Two common sizes : $5\frac{1}{2}$ " and $3\frac{1}{2}$ ".



ZIP DISKETTE

- Hard ware data storage device developed by lomega that functions like a Standard 1.44" floppy drive.



ZIP DISKETTE

- Hard ware data storage device developed by lomega that functions like a Standard 1.44" floppy drive.
- Capable to hold upto 100 MB of data or 250MB of data on new drives.



ZIP DISKETTE

- Hard ware data storage device developed by Iomega that functions like a Standard 1.44" floppy drive.
- Capable to hold upto 100 MB of data or 250MB of data on new drives.
- Now it less popular as users needed larger storage capabilities.



ZIP DISKETTE

- Hard ware data storage device developed by Iomega that functions like a Standard 1.44" floppy drive.
- Capable to hold upto 100 MB of data or 250MB of data on new drives.
- Now it less popular as users needed larger storage capabilities.



USB FLASH DRIVE

- A small, portable flash memory card that plugs into a computer's USB port and functions as a portable hard drive.



USB FLASH DRIVE

- A small, portable flash memory card that plugs into a computer's USB port and functions as a portable hard drive.
- Flash drives are available in sizes such as 256MB, 512MB, 1GB, 5GB, and 16 GB and are an easy way to transfer and store information.



MEMORY CARD

- An electronic flash memory storage disk commonly used in consumer electronic devices such as digital cameras, MP3 players, mobile phones, and other small portable devices.



MEMORY CARD

- An electronic flash memory storage disk commonly used in consumer electronic devices such as digital cameras, MP3 players, mobile phones, and other small portable devices.
- Memory cards are usually read by connecting the device containing the card to your computer, or by using a USB card reader.



FEATURES OF STORAGE DEVICES

Features of storage devices are in different types. They are

Rijoy K.J.



FEATURES OF STORAGE DEVICES

Features of storage devices are in different types. They are

- Volatility.

Rijoy K.J.



FEATURES OF STORAGE DEVICES

Features of storage devices are in different types. They are

- Volatility.
- Accessibility.

Rijoy K.J.



FEATURES OF STORAGE DEVICES

Features of storage devices are in different types. They are

- Volatility.
- Accessibility.
- Mutability.

Rijoy K.J.



FEATURES OF STORAGE DEVICES

Features of storage devices are in different types. They are

- Volatility.
- Accessibility.
- Mutability.
- Addressability.

Rijoy K.J.



FEATURES OF STORAGE DEVICES

Features of storage devices are in different types. They are

- Volatility.
- Accessibility.
- Mutability.
- Addressability.

VOLATILITY

Two types of memory is possible with storage devices.

- Volatile memory

FEATURES OF STORAGE DEVICES

Features of storage devices are in different types. They are

- Volatility.
- Accessibility.
- Mutability.
- Addressability.

VOLATILITY

Two types of memory is possible with storage devices.

- Volatile memory
- Non Volatile Memory.

VOLATILE AND NON-VOLATILE MEMORY

VOLATILE MEMORY

- Requires constant power to maintain the stored information.



VOLATILE AND NON-VOLATILE MEMORY

VOLATILE MEMORY

- Requires constant power to maintain the stored information.
- The fastest memory technologies.



VOLATILE AND NON-VOLATILE MEMORY

VOLATILE MEMORY

- Requires constant power to maintain the stored information.
- The fastest memory technologies.
- All contents are erased when the system's power is turned off or interrupted.



VOLATILE AND NON-VOLATILE MEMORY

VOLATILE MEMORY

- Requires constant power to maintain the stored information.
- The fastest memory technologies.
- All contents are erased when the system's power is turned off or interrupted.
- It has been more popularly known as temporary memory.



VOLATILE AND NON-VOLATILE MEMORY

VOLATILE MEMORY

- Requires constant power to maintain the stored information.
- The fastest memory technologies.
- All contents are erased when the system's power is turned off or interrupted.
- It has been more popularly known as temporary memory.

EXAMPLE

RAM has this type of memory

NON-VOLATILE MEMORY

- Will retain the stored information even if it is not constantly supplied with electric power.



VOLATILE AND NON-VOLATILE MEMORY

VOLATILE MEMORY

- Requires constant power to maintain the stored information.
- The fastest memory technologies.
- All contents are erased when the system's power is turned off or interrupted.
- It has been more popularly known as temporary memory.

EXAMPLE

RAM has this type of memory

NON-VOLATILE MEMORY

- Will retain the stored information even if it is not constantly supplied with electric power.
- Non volatile memory is the device which keeps the data even when the current is off.



VOLATILE AND NON-VOLATILE MEMORY

VOLATILE MEMORY

- Requires constant power to maintain the stored information.
- The fastest memory technologies.
- All contents are erased when the system's power is turned off or interrupted.
- It has been more popularly known as temporary memory.

EXAMPLE

RAM has this type of memory

NON-VOLATILE MEMORY

- Will retain the stored information even if it is not constantly supplied with electric power.
- Non volatile memory is the device which keeps the data even when the current is off.
- It is suitable for long-term storage of information.



VOLATILE AND NON-VOLATILE MEMORY

VOLATILE MEMORY

- Requires constant power to maintain the stored information.
- The fastest memory technologies.
- All contents are erased when the system's power is turned off or interrupted.
- It has been more popularly known as temporary memory.

EXAMPLE

RAM has this type of memory

NON-VOLATILE MEMORY

- Will retain the stored information even if it is not constantly supplied with electric power.
- Non volatile memory is the device which keeps the data even when the current is off.
- It is suitable for long-term storage of information.

EXAMPLE

Hard Disk has this feature.

ACCESSIBILITY

Accessibility refers to reading or writing data records. There are two types of accessibility.

Rijoy K.



ACCESSIBILITY

Accessibility refers to reading or writing data records. There are two types of accessibility.

- Random Access and
- Sequential Access.

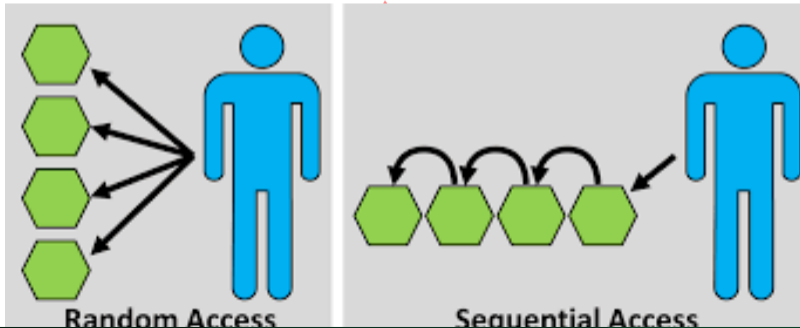
Rijoy K.



ACCESSIBILITY

Accessibility refers to reading or writing data records. There are two types of accessibility.

- Random Access and
- Sequential Access.



ACCESSIBILITY CONTD...

RANDOM ACCESS

- A random-access data file enables you to read or write information anywhere in the file.

Rijoy K.J.



ACCESSIBILITY CONTD...

RANDOM ACCESS

- A random-access data file enables you to read or write information anywhere in the file.
- Any location in storage can be accessed at any moment in approximately the same amount of time.

RIJOY K.J.



ACCESSIBILITY CONTD...

RANDOM ACCESS

- A random-access data file enables you to read or write information anywhere in the file.
- Any location in storage can be accessed at any moment in approximately the same amount of time.
- Such characteristic is well suited for primary and secondary storage.

SEQUENTIAL ACCESS

- In a sequential-access file, you can only read and write information sequentially, starting from the beginning of the file.

ACCESSIBILITY CONTD...

RANDOM ACCESS

- A random-access data file enables you to read or write information anywhere in the file.
- Any location in storage can be accessed at any moment in approximately the same amount of time.
- Such characteristic is well suited for primary and secondary storage.

SEQUENTIAL ACCESS

- In a sequential-access file, you can only read and write information sequentially, starting from the beginning of the file.
- The accessing of pieces of information will be in a serial order, one after the other; therefore the time to access a particular piece of information depends upon which piece of information was last accessed.

ACCESSIBILITY CONTD...

RANDOM ACCESS

- A random-access data file enables you to read or write information anywhere in the file.
- Any location in storage can be accessed at any moment in approximately the same amount of time.
- Such characteristic is well suited for primary and secondary storage.

SEQUENTIAL ACCESS

- In a sequential-access file, you can only read and write information sequentially, starting from the beginning of the file.
- The accessing of pieces of information will be in a serial order, one after the other; therefore the time to access a particular piece of information depends upon which piece of information was last accessed.
- Such characteristic is typical of off-line storage.

ACCESSIBILITY CONTD...

RANDOM ACCESS

- A random-access data file enables you to read or write information anywhere in the file.
- Any location in storage can be accessed at any moment in approximately the same amount of time.
- Such characteristic is well suited for primary and secondary storage.

SEQUENTIAL ACCESS

- In a sequential-access file, you can only read and write information sequentially, starting from the beginning of the file.
- The accessing of pieces of information will be in a serial order, one after the other; therefore the time to access a particular piece of information depends upon which piece of information was last accessed.
- Such characteristic is typical of off-line storage.

MUTABILITY

- Allows information to be overwritten at any time.

Rijoy K.J.



MUTABILITY

- Allows information to be overwritten at any time.
- A computer without some amount of read/write storage for primary storage purposes would be useless for many tasks.

Rijoy



MUTABILITY

- Allows information to be overwritten at any time.
- A computer without some amount of read/write storage for primary storage purposes would be useless for many tasks.
- There are three types of mutability.

Rijoy V. J.



MUTABILITY

- Allows information to be overwritten at any time.
- A computer without some amount of read/write storage for primary storage purposes would be useless for many tasks.
- There are three types of mutability.

1. READ/WRITE STORAGE OR MUTABLE STORAGE

- Allows information to be overwritten at any time.



MUTABILITY

- Allows information to be overwritten at any time.
- A computer without some amount of read/write storage for primary storage purposes would be useless for many tasks.
- There are three types of mutability.

1. READ/WRITE STORAGE OR MUTABLE STORAGE

- Allows information to be overwritten at any time.
- A computer without some amount of read/write storage for primary storage purposes would be useless for many tasks.



MUTABILITY

- Allows information to be overwritten at any time.
- A computer without some amount of read/write storage for primary storage purposes would be useless for many tasks.
- There are three types of mutability.

1. READ/WRITE STORAGE OR MUTABLE STORAGE

- Allows information to be overwritten at any time.
- A computer without some amount of read/write storage for primary storage purposes would be useless for many tasks.



MUTABILITY

2. READ ONLY STORAGE

- Retains the information stored at the time of manufacture, and write once storage(WORM) allows the information to be written only once at some point after manufacture.



MUTABILITY

2. READ ONLY STORAGE

- Retains the information stored at the time of manufacture, and write once storage(WORM) allows the information to be written only once at some point after manufacture.
- These are called immutable storage.



MUTABILITY

2. READ ONLY STORAGE

- Retains the information stored at the time of manufacture, and write once storage(WORM) allows the information to be written only once at some point after manufacture.
- These are called immutable storage.

3. SLOW WRITE, FAST READ STORAGE

- Read/write storage which allows information to be overwritten multiple times, but with the write operation being much slower than the read operation.



MUTABILITY

2. READ ONLY STORAGE

- Retains the information stored at the time of manufacture, and write once storage(WORM) allows the information to be written only once at some point after manufacture.
- These are called immutable storage.

3. SLOW WRITE, FAST READ STORAGE

- Read/write storage which allows information to be overwritten multiple times, but with the write operation being much slower than the read operation.



ADDRESSABILITY

There are three types of Addressability.

Rijoy K.



ADDRESSABILITY

There are three types of Addressability.

- Location - Addressable

Rijoy K. J.



ADDRESSABILITY

There are three types of Addressability.

- Location - Addressable
- File - Addressable

Rijoy K. J.



ADDRESSABILITY

There are three types of Addressability.

- Location - Addressable
- File - Addressable
- Content - Addressable

Rijoy K. J.



ADDRESSABILITY

There are three types of Addressability.

- Location - Addressable
- File - Addressable
- Content - Addressable

1. LOCATION ADDRESSABLE

Each individually accessible unit of information in storage is selected with its numerical memory address.



ADDRESSABILITY

There are three types of Addressability.

- Location - Addressable
- File - Addressable
- Content - Addressable

1. LOCATION ADDRESSABLE

Each individually accessible unit of information in storage is selected with its numerical memory address.

2. FILE ADDRESSABLE

Information is divided into files of variable length, and a particular file is selected with human-readable directory and file names.

ADDRESSABILITY

There are three types of Addressability.

- Location - Addressable
- File - Addressable
- Content - Addressable

1. LOCATION ADDRESSABLE

Each individually accessible unit of information in storage is selected with its numerical memory address.

2. FILE ADDRESSABLE

Information is divided into files of variable length, and a particular file is selected with human-readable directory and file names.

ADDRESSABILITY...CONTD...

CONTENT ADDRESSABILITY

- Each individually accessible unit of information is selected based on the basis of (part of) the contents stored there.



ADDRESSABILITY...CONTD...

CONTENT ADDRESSABILITY

- Each individually accessible unit of information is selected based on the basis of(part of) the contents stored there.
- Content-addressable storage can be implemented using software(computer program) or hardware (computer device), with hard ware being faster but more expensive option.



ADDRESSABILITY...CONTD...

CONTENT ADDRESSABILITY

- Each individually accessible unit of information is selected based on the basis of(part of) the contents stored there.
- Content-addressable storage can be implemented using software(computer program) or hardware (computer device), with hardware being faster but more expensive option.
- Hardware content addressable memory is often used in a computer's CPU cache.



ADDRESSABILITY...CONTD...

CONTENT ADDRESSABILITY

- Each individually accessible unit of information is selected based on the basis of(part of) the contents stored there.
- Content-addressable storage can be implemented using software(computer program) or hardware (computer device), with hardware being faster but more expensive option.
- Hardware content addressable memory is often used in a computer's CPU cache.



OTHER STORAGE DEVICES

1. PUNCH CARD

- Early method of data storage used with early computers.

Rijoy K.J.



OTHER STORAGE DEVICES

1. PUNCH CARD

- Early method of data storage used with early computers.
- Punch cards also known as Hollerith cards.

Rijoy K.J.



OTHER STORAGE DEVICES

1. PUNCH CARD

- Early method of data storage used with early computers.
- Punch cards also known as Hollerith cards.
- Containing several punched holes that represents data.

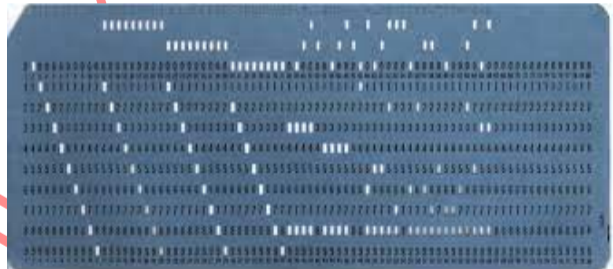
Rijoy K.J.



OTHER STORAGE DEVICES

1. PUNCH CARD

- Early method of data storage used with early computers.
- Punch cards also known as Hollerith cards.
- Containing several punched holes that represents data.



CLOUD STORAGE

- Cloud storage means "the storage of data online in the cloud, "wherein a data is stored in and accessible from multiple distributed and connected resources that comprise a cloud.



CLOUD STORAGE

- Cloud storage means "the storage of data online in the cloud, "wherein a data is stored in and accessible from multiple distributed and connected resources that comprise a cloud.
- Cloud storage can provide the benefits of greater accessibility and reliability; rapid deployment; strong protection for data backup, archival and disaster recovery purposes.



CLOUD STORAGE

- Cloud storage means "the storage of data online in the cloud, "wherein a data is stored in and accessible from multiple distributed and connected resources that comprise a cloud.
- Cloud storage can provide the benefits of greater accessibility and reliability; rapid deployment; strong protection for data backup, archival and disaster recovery purposes.
- Examples are
 - Google Drive
 - One Drive
 - Drop Box, etc.



RAID

- RAID is short for redundant array of independent(or inexpensive)disks.



RAID

- RAID is short for redundant array of independent(or inexpensive)disks.
- It is a category of disk drives that employ two or more drives in combination for fault tolerance and performance.



RAID

- RAID is short for redundant array of independent(or inexpensive)disks.
- It is a category of disk drives that employ two or more drives in combination for fault tolerance and performance.
- RAID disk drives are used frequently on servers but aren't generally necessary for personal computers.



RAID

- RAID is short for redundant array of independent(or inexpensive)disks.
- It is a category of disk drives that employ two or more drives in combination for fault tolerance and performance.
- RAID disk drives are used frequently on servers but aren't generally necessary for personal computers.
- RAID allows you to store the same data redundantly (in multiple paces)in a balanced way to improve over all storage performance.



INTRODUCTION

Hardware alone is not sufficient to operate a computer. It also requires softwares.

Rijoy K.J



INTRODUCTION

Hardware alone is not sufficient to operate a computer. It also requires softwares.

SOFTWARES

Software refers to programmes or sequence of instructions given to a a computer to perform a particular task. Generally a set of programmes is known as software.

Rijoy



INTRODUCTION

Hardware alone is not sufficient to operate a computer. It also requires softwares.

SOFTWARES

Software refers to programmes or sequence of instructions given to a a computer to perform a particular task. Generally a set of programmes is known as software.

TV IS A TYPICAL EXAMPLE

Hard ware can be compared to the television set bought from a TV shop. The TV is a useless box if no programmes or entertainments are received by the set. Therefore various programmes transmitted by the TV station are considered as the software.



INTRODUCTION

Hardware alone is not sufficient to operate a computer. It also requires softwares.

SOFTWARES

Software refers to programmes or sequence of instructions given to a a computer to perform a particular task. Generally a set of programmes is known as software.

TV IS A TYPICAL EXAMPLE

Hard ware can be compared to the television set bought from a TV shop. The TV is a useless box if no programmes or entertainments are received by the set. Therefore various programmes transmitted by the TV station are considered as the software.

Thus Software are programmes or series of instructions which are loaded into the computer before the computer can start its job.

SOFTWARE LICENSING

Software licensing is a contract agreement between the software publisher and the end user, sometimes referred to as the ***End User Licence Agreement***

Rijoy



SOFTWARE LICENSING

Software licensing is a contract agreement between the software publisher and the end user, sometimes referred to as the ***End User Licence Agreement***

A software licence is a legal instrument governing the usage or redistribution of software. All software are copyright protected, except material in the public domain. It is usually embedded in the software itself.



SOFTWARE LICENSES

Software license can be divided into two categories:

Rijoy K.J.



SOFTWARE LICENSES

Software license can be divided into two categories:

- 1 Proprietary software.

Rijoy K.J.



SOFTWARE LICENSES

Software license can be divided into two categories:

- 1 Proprietary software.
- 2 Free and Open Source Software.

Rijoy K.J.



SOFTWARE LICENSES

Software license can be divided into two categories:

- 1 Proprietary software.
- 2 Free and Open Source Software.

1. PROPRIETARY SOFTWARE

The main feature of proprietary software licenses is that the software publisher grants a licence to use one or more copies of software but the ownership of those copies remains with the publisher. Thus the term is known so.



SOFTWARE LICENSES

Software license can be divided into two categories:

- 1 Proprietary software.
- 2 Free and Open Source Software.

1. PROPRIETARY SOFTWARE

The main feature of proprietary software licenses is that the software publisher grants a licence to use one or more copies of software but the ownership of those copies remains with the publisher. Thus the term is known so.

In this type of licensing, or rights regarding the software are received by the software publisher and only a very limited set of well defined rights are passed to the end user. The most significant effect of this form of licensing is that, if ownership of the software remains with a software publisher, then the end user must accept the software license. Otherwise he cannot use it.



SOFTWARE LICENSING

2. FREE AND OPEN SOURCE SOFTWARE

In the case of free software license, ownership of a particular copy of the software does not remain with the software publisher. Instead, ownership is transferred to the end-user. As a result the end-user will get all rights granted by copyright law to the copy owner.

Rijoy



SOFTWARE LICENSING

2. FREE AND OPEN SOURCE SOFTWARE

In the case of free software license, ownership of a particular copy of the software does not remain with the software publisher. Instead, ownership is transferred to the end-user. As a result the end-user will get all rights granted by copyright law to the copy owner.

'Copy Owner' is not the same as 'Copy Right Owner'

Rijoy



SOFTWARE LICENSING

2. FREE AND OPEN SOURCE SOFTWARE

In the case of free software license, ownership of a particular copy of the software does not remain with the software publisher. Instead, ownership is transferred to the end-user. As a result the end-user will get all rights granted by copyright law to the copy owner.

'Copy Owner' is not the same as 'Copy Right Owner'

The ownership in a particular copy is transferred, ownership of the copyright remains with the software publisher. Additionally a free software licence typically grants to the end-user extra rights which would otherwise be reserved by the software publisher.

EXAMPLE

GNU General Public License (GPL)



SOFTWARE TYPES

Computer softwares can be broadly classified into two:

Rijoy K.J.



SOFTWARE TYPES

Computer softwares can be broadly classified into two:

- 1 System software and

Rijoy K.J.



SOFTWARE TYPES

Computer softwares can be broadly classified into two:

- 1 System software and
- 2 Application Software.

Rijoy K.J.



SOFTWARE TYPES

Computer softwares can be broadly classified into two:

- 1 System software and
- 2 Application Software.

SYSTEM SOFTWARE

- System software runs the computer.



SOFTWARE TYPES

Computer softwares can be broadly classified into two:

- 1 System software and
- 2 Application Software.

SYSTEM SOFTWARE

- System software runs the computer.
- The software needed to execute the users program is known as **System software**



SOFTWARE TYPES

Computer softwares can be broadly classified into two:

- 1 System software and
- 2 Application Software.

SYSTEM SOFTWARE

- System software runs the computer.
- The software needed to execute the users program is known as **System software**
- All applications and developmental programs can be executed only with the help of system software.



- System software consists of computer programs that manage and support a computer system.

Rijoy K.J.



- System software consists of computer programs that manage and support a computer system.
- The system software establishes a connection link between hardware and the application programs of users.

Rijoy K.J.



- System software consists of computer programs that manage and support a computer system.
- The system software establishes a connection link between hardware and the application programs of users.
- system software includes the operating system and all the utilities that enable the computer to operate.



OPERATING SYSTEM

The most important software package for any computer is the Operating system.

Rijoy K.J.



OPERATING SYSTEM

The most important software package for any computer is the Operating system.

DEFINITION

An **Operating system** is the system software responsible for the direct control and management of the hardware that makes up a computer and basic system operations.

Rijoy



OPERATING SYSTEM

The most important software package for any computer is the Operating system.

DEFINITION

An **Operating system** is the system software responsible for the direct control and management of the hardware that makes up a computer and basic system operations.

- Operating system is a collection of programs that control the overall operation of a computer.



OPERATING SYSTEM

The most important software package for any computer is the Operating system.

DEFINITION

An **Operating system** is the system software responsible for the direct control and management of the hardware that makes up a computer and basic system operations.

- Operating system is a collection of programs that control the overall operation of a computer.
- It control the operations of CPU, input and output units, storage units and provides support services for the execution of application programs.



OS - CONTD...

- The OS programs are stored in the main memory of the computer and is known as 'executive', 'supervisor' or control programs.



OS - CONTD...

- The OS programs are stored in the main memory of the computer and is known as 'executive', 'supervisor' or control programs.
- Operating system connects various languages and application program available.



OS - CONTD...

- The OS programs are stored in the main memory of the computer and is known as 'executive', 'supervisor' or control programs.
- Operating system connects various languages and application program available.
- With the OS, instead of worrying about the functioning of different hardware components, the user can concentrate his entire attention on his job itself.



OS - CONTD...

- The OS programs are stored in the main memory of the computer and is known as 'executive', 'supervisor' or control programs.
- Operating system connects various languages and application program available.
- With the OS, instead of worrying about the functioning of different hardware components, the user can concentrate his entire attention on his job itself.
- The more friendly the OS of a computer, the easier the interaction between the users and the computers.



OS - CONTD...

- The OS programs are stored in the main memory of the computer and is known as 'executive', 'supervisor' or control programs.
- Operating system connects various languages and application program available.
- With the OS, instead of worrying about the functioning of different hardware components, the user can concentrate his entire attention on his job itself.
- The more friendly the OS of a computer, the easier the interaction between the users and the computers.
- An OS enables the user to communicate with a computer and also enables the computer to communicate with peripheral devices.



EXAMPLE

The most popular OS for microcomputer is known as MS-DOS which is a disk based operating system.



EXAMPLE

The most popular OS for microcomputer is known as MS-DOS which is a disk based operating system.

UNIX is another popular operating system.



EXAMPLE

The most popular OS for microcomputer is known as MS-DOS which is a disk based operating system.

UNIX is another popular operating system.

Windows 95, 2000, XP, 7, 8.1, 10, etc are other popular OSs.



FUNCTIONS OF OS

1. JOB MANAGEMENT

- Job management includes preparing, scheduling, and monitoring jobs for continuous processing by the computer system.

Rijoy



FUNCTIONS OF OS

1. JOB MANAGEMENT

- Job management includes preparing, scheduling, and monitoring jobs for continuous processing by the computer system.
- It performs all activities relating to a particular job.



FUNCTIONS OF OS

1. JOB MANAGEMENT

- Job management includes preparing, scheduling, and monitoring jobs for continuous processing by the computer system.
- It performs all activities relating to a particular job.

EXAMPLE

The activities include selecting jobs for execution by the computer system, starting the processing of the job, finishing the job and communicating with the operator about the progress of the job.



OS FUNCTIONS - CONTD...

2. RESOURCE MANAGEMENT

- It refers to controlling the computer system resources by database management and other system software and by the application software program executed by the computer system.



OS FUNCTIONS - CONTD...

2. RESOURCE MANAGEMENT

- It refers to controlling the computer system resources by database management and other system software and by the application software program executed by the computer system.
- These sources include primary storage, secondary storage, CPU processing time and input- output devices.



OS FUNCTIONS - CONTD...

2. RESOURCE MANAGEMENT

- It refers to controlling the computer system resources by database management and other system software and by the application software program executed by the computer system.
- These sources include primary storage, secondary storage, CPU processing time and input- output devices.
- Effective management of all these computer resources is highly required for doing the job successfully.



OS FUNCTIONS - CONTD...

3. DATA MANAGEMENT

- Controlling of input-output data as well as their location, storage and retrieval come under the scope of data management.

Rijoy



OS FUNCTIONS - CONTD...

3. DATA MANAGEMENT

- Controlling of input-output data as well as their location, storage and retrieval come under the scope of data management.
- This is a collection of programs that performs all the functions required for the input and output of data.

Rijoy



OS FUNCTIONS - CONTD...

3. DATA MANAGEMENT

- Controlling of input-output data as well as their location, storage and retrieval come under the scope of data management.
- This is a collection of programs that performs all the functions required for the input and output of data.

MS-DOS CONSISTS OF THE FOLLOWING PROGRAMS

- A basic i/p-o/p system designated as IO.SYS :- Programs that read from input devices and write on output devices.

OS FUNCTIONS - CONTD...

3. DATA MANAGEMENT

- Controlling of input-output data as well as their location, storage and retrieval come under the scope of data management.
- This is a collection of programs that performs all the functions required for the input and output of data.

MS-DOS CONSISTS OF THE FOLLOWING PROGRAMS

- A basic i/p-o/p system designated as IO.SYS :- Programs that read from input devices and write on output devices.
- A Basic Disk Operating System designated as MS-DOS.SYS :- Programs that implement most of the functionalities as well as manages memory and files.

OS FUNCTIONS - CONTD...

3. DATA MANAGEMENT

- Controlling of input-output data as well as their location, storage and retrieval come under the scope of data management.
- This is a collection of programs that performs all the functions required for the input and output of data.

MS-DOS CONSISTS OF THE FOLLOWING PROGRAMS

- A basic i/p-o/p system designated as IO.SYS :- Programs that read from input devices and write on output devices.
- A Basic Disk Operating System designated as MS-DOS.SYS :- Programs that implement most of the functionalities as well as manages memory and files.
- Command language processors designated as command.COM :- Programs interpret commands and it controls DOS utilities to load and execute these commands.

TYPES OF OPERATING SYSTEMS

Following are the different types of operating systems.

Rijoy K.J.



TYPES OF OPERATING SYSTEMS

Following are the different types of operating systems.

1. REAL-TIME OS

- It is a multitasking OS that aims at executing real time applications.

TYPES OF OPERATING SYSTEMS

Following are the different types of operating systems.

1. REAL-TIME OS

- It is a multitasking OS that aims at executing real time applications.
- Real time operating system often use specialised scheduling algorithms so that they can achieve a deterministic nature of behaviour.

TYPES OF OPERATING SYSTEMS

Following are the different types of operating systems.

1. REAL-TIME OS

- It is a multitasking OS that aims at executing real time applications.
- Real time operating system often use specialised scheduling algorithms so that they can achieve a deterministic nature of behaviour.
- The main object of real time operating systems is their quick and predictable response to events.

TYPES OF OPERATING SYSTEMS

Following are the different types of operating systems.

1. REAL-TIME OS

- It is a multitasking OS that aims at executing real time applications.
- Real time operating system often use specialised scheduling algorithms so that they can achieve a deterministic nature of behaviour.
- The main object of real time operating systems is their quick and predictable response to events.
- They either have an event driven or time sharing design.

TYPES OF OPERATING SYSTEMS

Following are the different types of operating systems.

1. REAL-TIME OS

- It is a multitasking OS that aims at executing real time applications.
- Real time operating system often use specialised scheduling algorithms so that they can achieve a deterministic nature of behaviour.
- The main object of real time operating systems is their quick and predictable response to events.
- They either have an event driven or time sharing design.
- And event driven system switches between tasks based on their priorities where as in the case time sharing OS switch tasks based on clock interrupts.

2. MULTI-USER AND SINGLE USER OS

- The OSs of this type allow multiple users to access a computer system simultaneously.

Rijoy



2. MULTI-USER AND SINGLE USER OS

- The OSs of this type allow multiple users to access a computer system simultaneously.
- Single user operating systems are usable only by one user at a time.

Rijoy



2. MULTI-USER AND SINGLE USER OS

- The OSs of this type allow multiple users to access a computer system simultaneously.
- Single user operating systems are usable only by one user at a time.

Windows OS has multiple user accounts. But it is not a multi user OS, because it does not allow multiple users to log in simultaneously. Only the administrator is the real user.



2. MULTI-USER AND SINGLE USER OS

- The OSs of this type allow multiple users to access a computer system simultaneously.
- Single user operating systems are usable only by one user at a time.

Windows OS has multiple user accounts. But it is not a multi user OS, because it does not allow multiple users to log in simultaneously. Only the administrator is the real user. But in Linux or UNIX systems, they allow multiple users to log in simultaneously.



3. MULTI-TASKING AND SINGLE - TASKING OS

- In single tasking OSs only a single program is allowed to run at a time.

Rijoy K



3. MULTI-TASKING AND SINGLE - TASKING OS

- In single tasking OSs only a single program is allowed to run at a time.
- If an OS allow the execution of multiple tasks at one time, It is called a multitasking OS.

Rijoy K



3. MULTI-TASKING AND SINGLE - TASKING OS

- In single tasking OSs only a single program is allowed to run at a time.
- If an OS allow the execution of multiple tasks at one time, It is called a multitasking OS.

Multitasking OSs are of two types:

Rijoy K



3. MULTI-TASKING AND SINGLE - TASKING OS

- In single tasking OSs only a single program is allowed to run at a time.
- If an OS allow the execution of multiple tasks at one time, It is called a multitasking OS.

Multitasking OSs are of two types:

1. PRE-EMPTIVE OS

In pre-emptive OSs the OS slices the CPU time and dedicates one slot to each of the programs. e.g. UNIX and Linux systems support pre-emptive multitasking.



3. MULTI-TASKING AND SINGLE - TASKING OS

- In single tasking OSs only a single program is allowed to run at a time.
- If an OS allow the execution of multiple tasks at one time, It is called a multitasking OS.

Multitasking OSs are of two types:

1. PRE-EMPTIVE OS

In pre-emptive OSs the OS slices the CPU time and dedicates one slot to each of the programs. e.g. UNIX and Linux systems support pre-emptive multitasking.

2. CO-OPERATIVE OS

Co-operative multitasking is achieved by relying on each process to give time to the other processes in a predefined manner. e.g. MS-Windows prior to Windows 95 support this type.

OS TYPES

4. DISTRIBUTED OS

- An OS that manages a group of independent computers and makes them appear to be a single computer is known as a distributed OS.



OS TYPES

4. DISTRIBUTED OS

- An OS that manages a group of independent computers and makes them appear to be a single computer is known as a distributed OS.
- The development of networked computers that could be linked and communicate with each other, gave rise to distributed computing.



OS TYPES

4. DISTRIBUTED OS

- An OS that manages a group of independent computers and makes them appear to be a single computer is known as a distributed OS.
- The development of networked computers that could be linked and communicate with each other, gave rise to distributed computing.
- Distributed computations are carried out on more than one machine.



OS TYPES

4. DISTRIBUTED OS

- An OS that manages a group of independent computers and makes them appear to be a single computer is known as a distributed OS.
- The development of networked computers that could be linked and communicate with each other, gave rise to distributed computing.
- Distributed computations are carried out on more than one machine.
- When computers in a group work in cooperation, they make a distributed system.



OS TYPES

5. EMBEDDED SYSTEMS

- The OS designed for being used in embedded computer systems are known as embedded OSs.



OS TYPES

5. EMBEDDED SYSTEMS

- The OS designed for being used in embedded computer systems are known as embedded OSs.
- They are designed to operate on small machines like PDA's with less autonomy.



OS TYPES

5. EMBEDDED SYSTEMS

- The OS designed for being used in embedded computer systems are known as embedded OSs.
- They are designed to operate on small machines like PDA's with less autonomy.
- They are able to operate with limited number of resources.



OS TYPES

5. EMBEDDED SYSTEMS

- The OS designed for being used in embedded computer systems are known as embedded OSs.
- They are designed to operate on small machines like PDA's with less autonomy.
- They are able to operate with limited number of resources.
- They are very compact and extremely efficient by design.



OS TYPES

5. EMBEDDED SYSTEMS

- The OS designed for being used in embedded computer systems are known as embedded OSs.
- They are designed to operate on small machines like PDA's with less autonomy.
- They are able to operate with limited number of resources.
- They are very compact and extremely efficient by design.

EXAMPLE

Windows CE, FreeBSD and Minix 3



VARIOUS FEATURES OF OS ARE....

The important features of OSs are the following.

Rijoy K.J.



VARIOUS FEATURES OF OS ARE....

The important features of OSs are the following.

1. MANAGING HARDWARE AND SOFTWARE

- Operating system allows the hardware and software in a computer to interact with each other.



VARIOUS FEATURES OF OS ARE....

The important features of OSs are the following.

1. MANAGING HARDWARE AND SOFTWARE

- Operating system allows the hardware and software in a computer to interact with each other.
- It is the platform that enables one software in the computer to communicate with another.



VARIOUS FEATURES OF OS ARE....

The important features of OSs are the following.

1. MANAGING HARDWARE AND SOFTWARE

- Operating system allows the hardware and software in a computer to interact with each other.
- It is the platform that enables one software in the computer to communicate with another.
- Once the OS in a computer loads during the booting up process, other application software can be loaded into the computer.



FEATURES OF OS ARE....

2. CONSISTENT APPLICATION PROGRAM INTERFACE

- Application Program Interface(API) allows the applications that run on one computer to run on another computer having the same operating system.



FEATURES OF OS ARE....

2. CONSISTENT APPLICATION PROGRAM INTERFACE

- Application Program Interface(API) allows the applications that run on one computer to run on another computer having the same operating system.
- It is thus important that the operating system has a consistent API.
- Every operating system will have certain requirements, but it should be flexible enough to support computer hardware from different vendors.



FEATURES OF OS ARE....

2. CONSISTENT APPLICATION PROGRAM INTERFACE

- Application Program Interface(API) allows the applications that run on one computer to run on another computer having the same operating system.
- It is thus important that the operating system has a consistent API.
- Every operating system will have certain requirements, but it should be flexible enough to support computer hardware from different vendors.



FEATURES OF OS ARE....

3. PROGRAM EXECUTION

- The OS is responsible for executing all the programs running on it. Also it is a rather complicated process.



FEATURES OF OS ARE....

3. PROGRAM EXECUTION

- The OS is responsible for executing all the programs running on it. Also it is a rather complicated process.
- It may have ot allow multitasking and allow different programs to run at the same time and share the system resources.



FEATURES OF OS ARE....

3. PROGRAM EXECUTION

- The OS is responsible for executing all the programs running on it. Also it is a rather complicated process.
- It may have ot allow multitasking and allow different programs to run at the same time and share the system resources.
- It needs to allow RAM space to different applications running on the computer.



FEATURES OF OS ARE....

3. PROGRAM EXECUTION

- The OS is responsible for executing all the programs running on it. Also it is a rather complicated process.
- It may have to allow multitasking and allow different programs to run at the same time and share the system resources.
- It needs to allow RAM space to different applications running on the computer.
- The execution of more than one program may also require the operating system to prioritise the operations running on the computer.



FEATURES OF OS ARE....

4. INTERRUPTS

- The operating system needs to support a good number of interrupts to react with the immediate external environment.



FEATURES OF OS ARE....

4. INTERRUPTS

- The operating system needs to support a good number of interrupts to react with the immediate external environment.
- On receiving an interrupt, it should have the capability to stop the current execution and start of a new process.



FEATURES OF OS ARE....

4. INTERRUPTS

- The operating system needs to support a good number of interrupts to react with the immediate external environment.
- On receiving an interrupt, it should have the capability to stop the current execution and start of a new process.
- Interrupting is not a very simple process.



FEATURES OF OS ARE....

4. INTERRUPTS

- The operating system needs to support a good number of interrupts to react with the immediate external environment.
- On receiving an interrupt, it should have the capability to stop the current execution and start of a new process.
- Interrupting is not a very simple process.
- On receiving the interrupt, the computer operating systems should be such that they immediately save the status if the current applications and start executing the code of the particular interrupt.



FEATURES OF OS ARE....

5. MEMORY MANAGEMENT

- Computer operating system provides memory to the different programs running on the computer.



FEATURES OF OS ARE....

5. MEMORY MANAGEMENT

- Computer operating system provides memory to the different programs running on the computer.
- It has to prioritize and allocate memory to each application.



FEATURES OF OS ARE....

5. MEMORY MANAGEMENT

- Computer operating system provides memory to the different programs running on the computer.
- It has to prioritize and allocate memory to each application.
- Even when data is saved in a secondary storage device, it is the operating system that decides how should the information is to be stored.



FEATURES OF OS ARE....

6. ACCESSING DATA

- The data required by the any particular application software for its smooth running needs to be accessed by the operating system.



FEATURES OF OS ARE....

6. ACCESSING DATA

- The data required by the any particular application software for its smooth running needs to be accessed by the operating system.
- The operating system stores the data in a particular storage area in such a way that the data can be retrieved as ans when required.



FEATURES OF OS ARE....

6. ACCESSING DATA

- The data required by the any particular application software for its smooth running needs to be accessed by the operating system.
- The operating system stores the data in a particular storage area in such a way that the data can be retrieved as ans when required.
- The file system that different computers use is different.



FEATURES OF OS ARE....

6. ACCESSING DATA

- The data required by the any particular application software for its smooth running needs to be accessed by the operating system.
- The operating system stores the data in a particular storage area in such a way that the data can be retrieved as ans when required.
- The file system that different computers use is different.
- The OS needs to support these file systems.



FEATURES OF OS ARE....

6. ACCESSING DATA

- The data required by the any particular application software for its smooth running needs to be accessed by the operating system.
- The operating system stores the data in a particular storage area in such a way that the data can be retrieved as ans when required.
- The file system that different computers use is different.
- The OS needs to support these file systems.
- Irrespective of which file system is being used the OS should provide support for the same.



FEATURES OF OS ARE....

6. ACCESSING DATA

- The data required by the any particular application software for its smooth running needs to be accessed by the operating system.
- The operating system stores the data in a particular storage area in such a way that the data can be retrieved as ans when required.
- The file system that different computers use is different.
- The OS needs to support these file systems.
- Irrespective of which file system is being used the OS should provide support for the same.

EXAMPLE

Some computers may be using FAT 32 file systems, while certain others use NTFS file system. Linux OS use EXT4 type file system.

FEATURES OF OS ARE....

7. NETWORKING

- In the age of networking computers have to communicate with other computers and machines.
- A computer without internet is unimaginable.

Rijo



FEATURES OF OS ARE....

7. NETWORKING

- In the age of networking computers have to communicate with other computers and machines.
- A computer without internet is unimaginable.
- OS is responsible for providing required networking features for connecting with other computers and also with Internet.

Rijoy



FEATURES OF OS ARE....

7. NETWORKING

- In the age of networking computers have to communicate with other computers and machines.
- A computer without internet is unimaginable.
- OS is responsible for providing required networking features for connecting with other computers and also with Internet.

8. SECURITY

- In the present day situations security of an operating system is the most important feature.

FEATURES OF OS ARE....

7. NETWORKING

- In the age of networking computers have to communicate with other computers and machines.
- A computer without internet is unimaginable.
- OS is responsible for providing required networking features for connecting with other computers and also with Internet.

8. SECURITY

- In the present day situations security of an operating system is the most important feature.
- It is the duty of the OS to set up passwords for logging in, providing firewall protection, etc.

FEATURES OF OS ARE....

7. NETWORKING

- In the age of networking computers have to communicate with other computers and machines.
- A computer without internet is unimaginable.
- OS is responsible for providing required networking features for connecting with other computers and also with Internet.

8. SECURITY

- In the present day situations security of an operating system is the most important feature.
- It is the duty of the OS to set up passwords for logging in, providing firewall protection, etc.
- Network utilities may require file sharing, printer sharing, scanner sharing, TCP/IP

FEATURES OF OS ARE....

7. NETWORKING

- In the age of networking computers have to communicate with other computers and machines.
- A computer without internet is unimaginable.
- OS is responsible for providing required networking features for connecting with other computers and also with Internet.

8. SECURITY

- In the present day situations security of an operating system is the most important feature.
- It is the duty of the OS to set up passwords for logging in, providing firewall protection, etc.
- Network utilities may require file sharing, printer sharing, scanner sharing, TCP/IP

DOS

- DOS stands for disk operating system which means that a system for Operating the Disks.

Rijoy K.J.



DOS

- DOS stands for disk operating system which means that a system for Operating the Disks.
- It enables the operator to organise data files, load and execute program files, and control the input and output devices attached to the computer.

Rijoy K J



DOS

- DOS stands for disk operating system which means that a system for Operating the Disks.
- It enables the operator to organise data files, load and execute program files, and control the input and output devices attached to the computer.
- QDOS, the original version of DOS was belong to Seattle Computer Products, later it was owned by Microsoft.



DOS

- DOS stands for disk operating system which means that a system for Operating the Disks.
- It enables the operator to organise data files, load and execute program files, and control the input and output devices attached to the computer.
- QDOS, the original version of DOS was belong to Seattle Computer Products, later it was owned by Microsoft.
- It is the software that communicates with the hardware of your computer. An operating system is a collection of programs that provide services to to other programs so that the applications do not have to include the code to do these operations.



THINGS THAT CAN DO WITH DOS

- Dos controls the flow of information between you and the computer.i.e as translator.

Rijc



THINGS THAT CAN DO WITH DOS

- Dos controls the flow of information between you and the computer.i.e as translator.
- DOS allows you to store information on your computer.

Rijc



THINGS THAT CAN DO WITH DOS

- Dos controls the flow of information between you and the computer.i.e as translator.
- DOS allows you to store information on your computer.
- DOS allows you to retrieve information stored on your computer.

Rijc



THINGS THAT CAN DO WITH DOS

- Dos controls the flow of information between you and the computer.i.e as translator.
- DOS allows you to store information on your computer.
- DOS allows you to retrieve information stored on your computer.
- It interprets and translates the software you have on your computer.

Rijc



THINGS THAT CAN DO WITH DOS

- Dos controls the flow of information between you and and the computer.i.e as translator.
 - DOS allows you to store information on your computer.
 - DOS allows you to retrieve information stored on your computer.
 - It interprets and translates the software you have on your computer.
 - It gives you to access to all its function.
-
- DOS is entirely a text based system.

THINGS THAT CAN DO WITH DOS

- Dos controls the flow of information between you and the computer.i.e as translator.
 - DOS allows you to store information on your computer.
 - DOS allows you to retrieve information stored on your computer.
 - It interprets and translates the software you have on your computer.
 - It gives you to access to all its function.
-
- DOS is entirely a text based system.
 - Here the user type in commands using the keyboard followed by a symbol “C:>” or “A:>” which is known as prompt or command prompt.

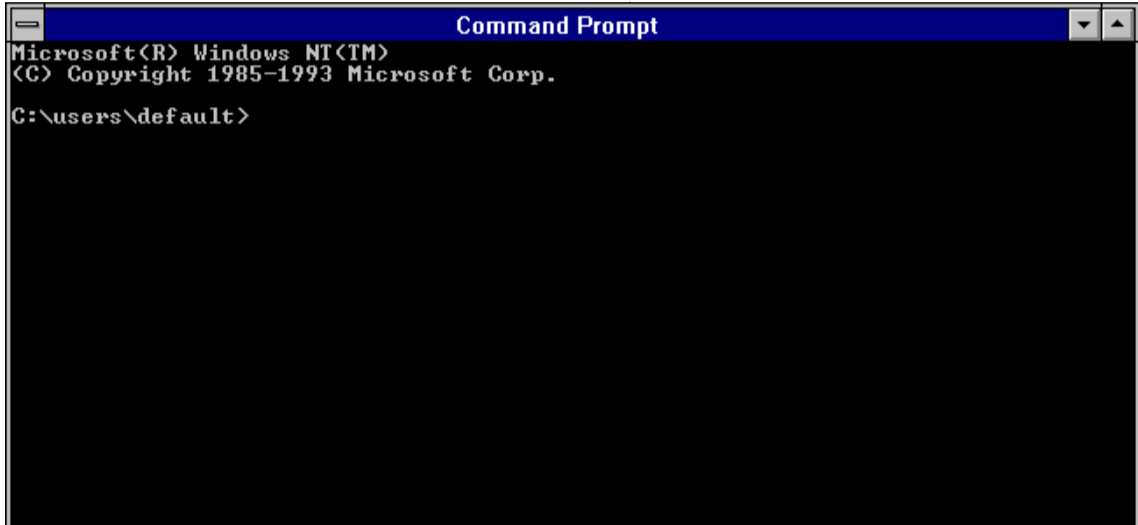
THINGS THAT CAN DO WITH DOS

- Dos controls the flow of information between you and the computer.i.e as translator.
 - DOS allows you to store information on your computer.
 - DOS allows you to retrieve information stored on your computer.
 - It interprets and translates the software you have on your computer.
 - It gives you to access to all its function.
-
- DOS is entirely a text based system.
 - Here the user type in commands using the keyboard followed by a symbol “C:>” or “A:>” which is known as prompt or command prompt.
 - The system is entirely case insensitive.

THINGS THAT CAN DO WITH DOS

- Dos controls the flow of information between you and the computer.i.e as translator.
 - DOS allows you to store information on your computer.
 - DOS allows you to retrieve information stored on your computer.
 - It interprets and translates the software you have on your computer.
 - It gives you to access to all its function.
-
- DOS is entirely a text based system.
 - Here the user type in commands using the keyboard followed by a symbol “C:>” or “A:>” which is known as prompt or command prompt.
 - The system is entirely case insensitive.

THE PROMPT



```
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1993 Microsoft Corp.

C:\users\default>
```

PROMPT - CONTD...

- All commands are typed at the prompt.



PROMPT - CONTD...

- All commands are typed at the prompt.
- Prompt gives you an information or prompt you that the computer is waiting for your input or waiting for you to tell what to do.

PROMPT - CONTD...

- All commands are typed at the prompt.
- Prompt gives you an information or prompt you that the computer is waiting for your input or waiting for you to tell what to do.
- After you have typed a command at prompt you have to press the enter key to let the computer know that you are done telling it what to do and that it should now act on your instructions.

PROMPT - CONTD...

- All commands are typed at the prompt.
- Prompt gives you an information or prompt you that the computer is waiting for your input or waiting for you to tell what to do.
- After you have typed a command at prompt you have to press the enter key to let the computer know that you are done telling it what to do and that it should now act on your instructions.
- If you make a message in typing your command, you will get an error message and a new prompt, You need to retype the command correctly to make the computer to act further.

PROMPT - CONTD...

- All commands are typed at the prompt.
- Prompt gives you an information or prompt you that the computer is waiting for your input or waiting for you to tell what to do.
- After you have typed a command at prompt you have to press the enter key to let the computer know that you are done telling it what to do and that it should now act on your instructions.
- If you make a message in typing your command, you will get an error message and a new prompt, You need to retype the command correctly to make the computer to act further.
- This is the very fundamental way to interact with your computer.

MACINTOSH GUI



MACINTOSH SYSTEM

- Macintosh is the line of operating system developed and marketed by Apple Inc.



MACINTOSH SYSTEM

- Macintosh is the line of operating system developed and marketed by Apple Inc.
- It is the primary operating system of Apple Computers.



MACINTOSH SYSTEM

- Macintosh is the line of operating system developed and marketed by Apple Inc.
- It is the primary operating system of Apple Computers.
- It is a UNIX based operating system and it is often credited for the start of the graphical user interface systems.



MACINTOSH SYSTEM

- Macintosh is the line of operating system developed and marketed by Apple Inc.
- It is the primary operating system of Apple Computers.
- It is a UNIX based operating system and it is often credited for the start of the graphical user interface systems.
- Newer versions of Mac systems have a great GUI system.



MACINTOSH SYSTEM

- Macintosh is the line of operating system developed and marketed by Apple Inc.
- It is the primary operating system of Apple Computers.
- It is a UNIX based operating system and it is often credited for the start of the graphical user interface systems.
- Newer versions of Mac systems have a great GUI system.



WINDOWS SERIES

- In 1983 Microsoft announced a GUI with MS-DOS.

WINDOWS SERIES

- In 1983 Microsoft announced a GUI with MS-DOS.
- Microsoft Windows 2 came in 1987, but was a failure.

WINDOWS SERIES

- In 1983 Microsoft announced a GUI with MS-DOS.
- Microsoft Windows 2 came in 1987, but was a failure.
- Around 1992, they developed Windows 3.1, after that they released Windows 3.11 with network drivers and support for protocols and peer to peer networking.

WINDOWS SERIES

- In 1983 Microsoft announced a GUI with MS-DOS.
- Microsoft Windows 2 came in 1987, but was a failure.
- Around 1992, they developed Windows 3.1, after that they released Windows 3.11 with network drivers and support for protocols and peer to peer networking.
- In August 1995, Microsoft unleashed the “Windows-95”

WINDOWS SERIES

- In 1983 Microsoft announced a GUI with MS-DOS.
- Microsoft Windows 2 came in 1987, but was a failure.
- Around 1992, they developed Windows 3.1, after that they released Windows 3.11 with network drivers and support for protocols and peer to peer networking.
- In August 1995, Microsoft unleashed the “Windows-95”
- IN June 1998, there was the release of “Windows 98” with hardware drivers and internet explorer.

WINDOWS SERIES

- In 1983 Microsoft announced a GUI with MS-DOS.
- Microsoft Windows 2 came in 1987, but was a failure.
- Around 1992, they developed Windows 3.1, after that they released Windows 3.11 with network drivers and support for protocols and peer to peer networking.
- In August 1995, Microsoft unleashed the “Windows-95”
- IN June 1998, there was the release of “Windows 98” with hardware drivers and internet explorer.
- Windows 2000 (Windows NT 5) came in the year 2000 for use as server and workstation.

WINDOWS SERIES

- In 1983 Microsoft announced a GUI with MS-DOS.
- Microsoft Windows 2 came in 1987, but was a failure.
- Around 1992, they developed Windows 3.1, after that they released Windows 3.11 with network drivers and support for protocols and peer to peer networking.
- In August 1995, Microsoft unleashed the “Windows-95”
- IN June 1998, there was the release of “Windows 98” with hardware drivers and internet explorer.
- Windows 2000 (Windows NT 5) came in the year 2000 for use as server and workstation.
- Later they released Windows XP, Windows 7, Windows 8.1 and Windows 10 which are popular one after one.

FEATURES OF WINDOWS

1. MULTITASKING.

- The greatest advantage of windows is the ability to have several programs and documents open at the same time.

Rijoy



FEATURES OF WINDOWS

1. MULTITASKING.

- The greatest advantage of windows is the ability to have several programs and documents open at the same time.
- Having this capability, one need not exit a program in order to access information from another program.

Rijoy



FEATURES OF WINDOWS

1. MULTITASKING.

- The greatest advantage of windows is the ability to have several programs and documents open at the same time.
- Having this capability, one need not exit a program in order to access information from another program.
- One can switch among programs.



FEATURES OF WINDOWS

1. MULTITASKING.

- The greatest advantage of windows is the ability to have several programs and documents open at the same time.
- Having this capability, one need not exit a program in order to access information from another program.
- One can switch among programs.

2. STANDARD MENU SYSTEM

- Microsoft imposes strict formatting guidelines for Windows programs. All Windows XP programs must use a standard menu system.

FEATURES OF WINDOWS

1. MULTITASKING.

- The greatest advantage of windows is the ability to have several programs and documents open at the same time.
- Having this capability, one need not exit a program in order to access information from another program.
- One can switch among programs.

2. STANDARD MENU SYSTEM

- Microsoft imposes strict formatting guidelines for Windows programs. All Windows XP programs must use a standard menu system.
- As a result, we will find the same menu system and similar choices in all Windows XP programs.

WINDOWS CONTD..

3. MENU COMMANDS

- Commands are directions given to computer. When we invoke a command we are telling the computer to perform a specific task.

Rijoy



WINDOWS CONTD..

3. MENU COMMANDS

- Commands are directions given to computer. When we invoke a command we are telling the computer to perform a specific task.
- In Windows XP, we give commands by choosing them from menus listed on our screen.

Rijoy



WINDOWS CONTD..

3. MENU COMMANDS

- Commands are directions given to computer. When we invoke a command we are telling the computer to perform a specific task.
- In Windows XP, we give commands by choosing them from menus listed on our screen.

4. CLIPBOARD

- The clipboard is temporary storage area.

WINDOWS CONTD..

3. MENU COMMANDS

- Commands are directions given to computer. When we invoke a command we are telling the computer to perform a specific task.
- In Windows XP, we give commands by choosing them from menus listed on our screen.

4. CLIPBOARD

- The clipboard is temporary storage area.
- The clipboard stores cut or copied information until we paste it or cut or copy new information.

WINDOWS CONTD..

3. MENU COMMANDS

- Commands are directions given to computer. When we invoke a command we are telling the computer to perform a specific task.
- In Windows XP, we give commands by choosing them from menus listed on our screen.

4. CLIPBOARD

- The clipboard is temporary storage area.
- The clipboard stores cut or copied information until we paste it or cut or copy new information.
- We use the clipboard whenever we move or copy information in one program to another program.

WINDOWS CONTD..

3. MENU COMMANDS

- Commands are directions given to computer. When we invoke a command we are telling the computer to perform a specific task.
- In Windows XP, we give commands by choosing them from menus listed on our screen.

4. CLIPBOARD

- The clipboard is temporary storage area.
- The clipboard stores cut or copied information until we paste it or cut or copy new information.
- We use the clipboard whenever we move or copy information in one program to another program.

WINDOWS CONTD..

3. MENU COMMANDS

- Commands are directions given to computer. When we invoke a command we are telling the computer to perform a specific task.
- In Windows XP, we give commands by choosing them from menus listed on our screen.

4. CLIPBOARD

- The clipboard is temporary storage area.
- The clipboard stores cut or copied information until we paste it or cut or copy new information.
- We use the clipboard whenever we move or copy information in one program to another program.

5. RECYCLE BIN

- Whenever we delete a folder or file from our computer, Windows places the item in the Recycle bin from where we can retrieve it in the case of accidental deletion.



ABOUT UNIX

- Unix is an operating system designed by Kenneth Thompson and Dennis Ritchie.



ABOUT UNIX

- Unix is an operating system designed by Kenneth Thompson and Dennis Ritchie.
- It was very popular because of its power flexibility and portability.
- UNIX can run on platforms ranging from mainframes, minicomputers, PCs and Macs.



ABOUT UNIX

- Unix is an operating system designed by Kenneth Thompson and Dennis Ritchie.
- It was very popular because of its power flexibility and portability.
- UNIX can run on platforms ranging from mainframes, minicomputers, PCs and Macs.



UNIX OS - AN OVERVIEW

- The UNIX system was designed to access the computer by a number of programmers at the same time and share its resources.



UNIX OS - AN OVERVIEW

- The UNIX system was designed to access the computer by a number of programmers at the same time and share its resources.
- The OS coordinates the use of the computers resources, allowing one person, for example to run a spell check program while another creates a document let another edit a document while another creates graphics and lets another user format a document- all at the same time, with each user oblivious to the activities of the others.



UNIX OS - AN OVERVIEW

- The UNIX system was designed to access the computer by a number of programmers at the same time and share its resources.
- The OS coordinates the use of the computers resources, allowing one person, for example to run a spell check program while another creates a document let another edit a document while another creates graphics and lets another user format a document- all at the same time, with each user oblivious to the activities of the others.
- The operating system controls all of the commands from all og the keyboards and all of the data being generated, and permits each user to believe he or she is the only person working on the computer.



UNIX OS - AN OVERVIEW

- It is very popular among the scientific, engineering and academic communities due to its multi-user, multi-tasking environment, flexibility, portability electronic mail and networking capabilities and the numerous programming, text processing, and scientific utilities, available.



UNIX OS - AN OVERVIEW

- It is very popular among the scientific, engineering and academic communities due to its multi-user, multi-tasking environment, flexibility, portability electronic mail and networking capabilities and the numerous programming, text processing, and scientific utilities, available.
- It has gained widespread acceptance in Government business.



FEATURES OF UNIX

1. MULTITASKING

- Unlike many other OS UNIX allows the user to perform several tasks at a time.



FEATURES OF UNIX

1. MULTITASKING

- Unlike many other OS UNIX allows the user to perform several tasks at a time.
- This is a major feature for users that one don't have to wait for one program to end for starting another one.



2. MULTIUSERS

- UNIX permits multiple users to log in.



2. MULTIUSERS

- UNIX permits multiple users to log in.
- The computer can take the commands of a number of users to run the programs, access files, and print documents at the same time.



2. MULTIUSERS

- UNIX permits multiple users to log in.
- The computer can take the commands of a number of users to run the programs, access files, and print documents at the same time.
- This does not mean that if several users use print command, it does print all the documents at once, instead it prioritises the tasks.



2. MULTIUSERS

- UNIX permits multiple users to log in.
- The computer can take the commands of a number of users to run the programs, access files, and print documents at the same time.
- This does not mean that if several users use print command, it does print all the documents at once, instead it prioritises the tasks.
- It also lets several users to access the same document by compartmentalising the document so that the changes of one user don't override the changes of another user.



FEATURES OF UNIX

3. SYSTEM PORTABILITY

- A major contribution of the UNIX system was its portability, permitting it to move to from one brand of computer to another brand of computer with a minimum code changes.



FEATURES OF UNIX

3. SYSTEM PORTABILITY

- A major contribution of the UNIX system was its portability, permitting it to move to from one brand of computer to another brand of computer with a minimum code changes.
- It also meant that the OS could be upgraded without having all the customers data in-putted again.



FEATURES OF UNIX

3. SYSTEM PORTABILITY

- A major contribution of the UNIX system was its portability, permitting it to move to from one brand of computer to another brand of computer with a minimum code changes.
- It also meant that the OS could be upgraded without having all the customers data in-putted again.
- New versions of UNIX were backward compatible with older versions, making it easier for companies to upgrade in an orderly manner.



FEATURES OF UNIX

4. UNIX TOOLS

UNIX comes with hundreds of programs that can be divided into two classes:



FEATURES OF UNIX

4. UNIX TOOLS

UNIX comes with hundreds of programs that can be divided into two classes:

- Integral Utilities :- They are absolutely necessary for the operation of the computer, such as command interpreter.



FEATURES OF UNIX

4. UNIX TOOLS

UNIX comes with hundreds of programs that can be divided into two classes:

- Integral Utilities :- They are absolutely necessary for the operation of the computer, such as command interpreter.
- Tools :- Tool that is not necessary for the operation of the UNIX but provide the user with additional capabilities, such as typesetting capabilities and e-mail.



5. APPLICATION LIBRARIES

- Today there are hundreds of UNIX applications that can be purchased from third party vendors, in addition to the applications that come with UNIX.



5. APPLICATION LIBRARIES

- Today there are hundreds of UNIX applications that can be purchased from third party vendors, in addition to the applications that come with UNIX.
- These applications are developed by different programmers and developers world wide, through years.



THE KERNEL

- The Kernel of UNIX is the core of the Operating System.



THE KERNEL

- The Kernel of UNIX is the core of the Operating System.
- Some of its main functions are managing files, handling communications, allocating time and memory to programs via system calls.



THE KERNEL

- The Kernel of UNIX is the core of the Operating System.
- Some of its main functions are managing files, handling communications, allocating time and memory to programs via system calls.
- The kernel controls the hardware and turns part of the system on and off at the programmers;s command.



THE KERNEL

- The Kernel of UNIX is the core of the Operating System.
- Some of its main functions are managing files, handling communications, allocating time and memory to programs via system calls.
- The kernel controls the hardware and turns part of the system on and off at the programmers;s command.
- If you ask the the computer to list all the files in a directory, the kernel tells the computer to read all the files in that directory from the disk and display them on your screen.



THE SHELL

- Users most often use UNIX through the shell. The shell is a command line interpreter.



THE SHELL

- Users most often use UNIX through the shell. The shell is a command line interpreter.
- It functions as an interface between the user and the kernel.



THE SHELL

- Users most often use UNIX through the shell. The shell is a command line interpreter.
- It functions as an interface between the user and the kernel.
- When a user logs in the login program verifies the user name and password, and then starts the shell.



THE SHELL

- Users most often use UNIX through the shell. The shell is a command line interpreter.
- It functions as an interface between the user and the kernel.
- When a user logs in the login program verifies the user name and password, and then starts the shell.
- Commands entered by the user are passed by the shell to the operating system which carries them out.



THE SHELL

- Users most often use UNIX through the shell. The shell is a command line interpreter.
- It functions as an interface between the user and the kernel.
- When a user logs in the login program verifies the user name and password, and then starts the shell.
- Commands entered by the user are passed by the shell to the operating system which carries them out.
- The results are then passed back by the shell and displayed on the user's display.



UNIX - CONTD...

BASIC UNIX ELEMENTS

There are six basic elements of UNIX. They are:



UNIX - CONTD...

BASIC UNIX ELEMENTS

There are six basic elements of UNIX. They are:

- 1 **Commands** :-Commands are the instructions given by you to tell it what to do.



UNIX - CONTD...

BASIC UNIX ELEMENTS

There are six basic elements of UNIX. They are:

- 1 Commands :-Commands are the instructions given by you to tell it what to do.
- 2 Files:



UNIX - CONTD...

BASIC UNIX ELEMENTS

There are six basic elements of UNIX. They are:

- 1 Commands :-Commands are the instructions given by you to tell it what to do.
- 2 Files:
 - Files are collections of data that have been given file names.



UNIX - CONTD...

BASIC UNIX ELEMENTS

There are six basic elements of UNIX. They are:

- 1 Commands :-Commands are the instructions given by you to tell it what to do.
- 2 Files:
 - Files are collections of data that have been given file names.
 - A file is analogous to a container in which you can store documents, raw data, or programs.



UNIX - CONTD...

BASIC UNIX ELEMENTS

There are six basic elements of UNIX. They are:

- 1 Commands :-Commands are the instructions given by you to tell it what to do.
- 2 Files:
 - Files are collections of data that have been given file names.
 - A file is analogous to a container in which you can store documents, raw data, or programs.
 - A single file might contain the text of a research project, statistical data or an equation processing formula.



UNIX - CONTD...

BASIC UNIX ELEMENTS

There are six basic elements of UNIX. They are:

- 1 Commands :-Commands are the instructions given by you to tell it what to do.
- 2 Files:
 - Files are collections of data that have been given file names.
 - A file is analogous to a container in which you can store documents, raw data, or programs.
 - A single file might contain the text of a research project, statistical data or an equation processing formula.
 - Files are stored in directories.



3 Directories :

- A directory is similar to a file cabinet drawer that contains many files.

Rijoy K.J.



3 Directories :

- A directory is similar to a file cabinet drawer that contains many files.
- A directory can also contain many directories.

Rijoy K J



3 Directories :

- A directory is similar to a file cabinet drawer that contains many files.
- A directory can also contain many directories.
- Every directory has a name just like files.

Rijoy K. J.



BASIC UNIX ELEMENTS - CONTD...

- Your Environment is a collection of items that describe or modify how your computing session will be carried out.



BASIC UNIX ELEMENTS - CONTD...

- Your Environment is a collection of items that describe or modify how your computing session will be carried out.
It contains things such as where the commands are located, which printer to send your out put to or even what are the applications that you use, etc.



BASIC UNIX ELEMENTS - CONTD...

- Your Environment is a collection of items that describe or modify how your computing session will be carried out.
It contains things such as where the commands are located, which printer to send your out put to or even what are the applications that you use, etc.
- Process :- A command or application running on the computer is called a process.



BASIC UNIX ELEMENTS - CONTD...

- Your Environment is a collection of items that describe or modify how your computing session will be carried out.
It contains things such as where the commands are located, which printer to send your out put to or even what are the applications that you use, etc.
- Process :- A command or application running on the computer is called a process.
- The sequence of instructions given to a computer from the time you initiate a particular task until it ends is called a job.



BASIC UNIX ELEMENTS - CONTD...

- Your Environment is a collection of items that describe or modify how your computing session will be carried out.
It contains things such as where the commands are located, which printer to send your out put to or even what are the applications that you use, etc.
- Process :- A command or application running on the computer is called a process.
- The sequence of instructions given to a computer from the time you initiate a particular task until it ends is called a job.
A job may have one or more processes in it.



LINUX OS

HISTORY

- Linux was written by Linus Torvalds and has been improved by countless number of people worldwide.



LINUX OS

HISTORY

- Linux was written by Linus Torvalds and has been improved by countless number of people worldwide.
- Linux is concerned with the GNU software project led by Richard Stallman.



LINUX OS

HISTORY

- Linux was written by Linus Torvalds and has been improved by countless number of people worldwide.
- Linux is concerned with the GNU software project led by Richard Stallman.
- Linux kernel was initially written by a young Finnish University student, but later thousands of programmers participated in the project creating a completely functional operating system.



LINUX OS

HISTORY

- Linux was written by Linus Torvalds and has been improved by countless number of people worldwide.
- Linux is concerned with the GNU software project led by Richard Stallman.
- Linux kernel was initially written by a young Finnish University student, but later thousands of programmers participated in the project creating a completely functional operating system.
- The “Linux” applied to whole Linux distributions, which typically consists of large number of software.



LINUX OS

HISTORY - CONTD....

- The 'GNU' project (pronounced as 'guh-NOO') was launched by Richard Stallman with the goal of creating a complete free operating system.
- The Linux trademark is owned by Linus Torwald, and is defined as " Computer operating system software to facilitate computer use and operation".



LINUX OS

HISTORY - CONTD....

- The 'GNU' project (pronounced as 'guh-NOO') was launched by Richard Stallman with the goal of creating a complete free operating system.
- The Linux trademark is owned by Linus Torwald, and is defined as " Computer operating system software to facilitate computer use and operation".
- There are many Linux distributions assembled by individuals, corporations, and other organisations and each may include any number of additional system software and application programs as well as a program to install the whole system on a new computer.



HISTORY OF LINUX - CONTD...

- The core of Linux each distribution include the Linux kernel but also various software packages from GNU project including a shell and utilities such as libraries, compilers and editors.
- Linux users, who traditionally had to install and configure their own system, have been stereotypically more technologically oriented than those of MS Windows and Mac OS.



- With the adoption of Linux by several PC manufacturers, computers with pre-installed Linux distributions are common.

Rijoy K J



- With the adoption of Linux by several PC manufacturers, computers with pre installed Linux distributions are common.
- Linux is also an embedded system.

Rijoy K J



- With the adoption of Linux by several PC manufacturers, computers with pre installed Linux distributions are common.
- Linux is also an embedded system.
- Linux makes it possible to use it in devices such as the Simputer, a low cost computer aimed especially at low-income populations in developing nations.



FEATURES OF LINUX

- Multitasking.

FEATURES OF LINUX

- Multitasking.
- Multi-users.

FEATURES OF LINUX

- Multitasking.
- Multi-users.
- Multi platforms :- It runs on many different CPUs.

FEATURES OF LINUX

- Multitasking.
- Multi-users.
- Multi platforms :- It runs on many different CPUs.
- Under Linux to identify yourself to the system you must log in, which entails entering your login ID and password. No one else can log in to the system because you only know the password.

FEATURES OF LINUX

- Multitasking.
- Multi-users.
- Multi platforms :- It runs on many different CPUs.
- Under Linux to identify yourself to the system you must log in, which entails entering your login ID and password. No one else can log in to the system because you only know the password.
- Before you can use a newly installed Linux system, you have to set up user accounts along with root account(Administrator).

FEATURES OF LINUX

- Multitasking.
- Multi-users.
- Multi platforms :- It runs on many different CPUs.
- Under Linux to identify yourself to the system you must log in, which entails entering your login ID and password. No one else can log in to the system because you only know the password.
- Before you can use a newly installed Linux system, you have to set up user accounts along with root account(Administrator).
- It is not a good idea to use the root account for normal use. Instead you should reserve this account only for running privileged commands and for maintaining the system.

FEATURES OF LINUX

- Multitasking.
- Multi-users.
- Multi platforms :- It runs on many different CPUs.
- Under Linux to identify yourself to the system you must log in, which entails entering your login ID and password. No one else can log in to the system because you only know the password.
- Before you can use a newly installed Linux system, you have to set up user accounts along with root account(Administrator).
- It is not a good idea to use the root account for normal use. Instead you should reserve this account only for running privileged commands and for maintaining the system.

APPLICATION SOFTWARES

- Application software refers to program designed to accomplish a particular task.



APPLICATION SOFTWARES

- Application software refers to program designed to accomplish a particular task.
- A program which is prepared by a programmer to solve certain problem or to perform certain specified task is known as application program.



APPLICATION SOFTWARES

- Application software refers to program designed to accomplish a particular task.
- A program which is prepared by a programmer to solve certain problem or to perform certain specified task is known as application program.
- A single application program can be used for doing the same job at any number of times without any interruption.



APPLICATION SOFTWARES

- Application software refers to program designed to accomplish a particular task.
- A program which is prepared by a programmer to solve certain problem or to perform certain specified task is known as application program.
- A single application program can be used for doing the same job at any number of times without any interruption.
- An application program designed to do a particular job cannot be used for using any other job.



MAJOR APPLICATION SOFTWARES

1. MS OFFICE.

- Microsoft is the definitely the company that holds the largest share of productivity software market.

MAJOR APPLICATION SOFTWARES

1. MS OFFICE.

- Microsoft is the definitely the company that holds the largest share of productivity software market.
- Most consumers like to use the same software as the companies they work for, primarily for the ease of moving files between the two.

MAJOR APPLICATION SOFTWARES

1. MS OFFICE.

- Microsoft is the definitely the company that holds the largest share of productivity software market.
- Most consumers like to use the same software as the companies they work for, primarily for the ease of moving files between the two.
- Productivity software included with most new computers.

MAJOR APPLICATION SOFTWARES

1. MS OFFICE.

- Microsoft is the definitely the company that holds the largest share of productivity software market.
- Most consumers like to use the same software as the companies they work for, primarily for the ease of moving files between the two.
- Productivity software included with most new computers.
- This of course increases the portability of documents between computers.

MAJOR APPLICATION SOFTWARES

1. MS OFFICE.

- Microsoft is the definitely the company that holds the largest share of productivity software market.
- Most consumers like to use the same software as the companies they work for, primarily for the ease of moving files between the two.
- Productivity software included with most new computers.
- This of course increases the portability of documents between computers.
- The confusing part of MS Office suite is it comes into many different versions.

MAJOR APPLICATION SOFTWARES

1. MS OFFICE.

- Microsoft is the definitely the company that holds the largest share of productivity software market.
- Most consumers like to use the same software as the companies they work for, primarily for the ease of moving files between the two.
- Productivity software included with most new computers.
- This of course increases the portability of documents between computers.
- The confusing part of MS Office suite is it comes into many different versions.
- The contents and the look included in the versions vary, as well as the licence for what the software can be used for.

MAJOR APPLICATION SOFTWARES

1. MS OFFICE.

- Microsoft is the definitely the company that holds the largest share of productivity software market.
- Most consumers like to use the same software as the companies they work for, primarily for the ease of moving files between the two.
- Productivity software included with most new computers.
- This of course increases the portability of documents between computers.
- The confusing part of MS Office suite is it comes into many different versions.
- The contents and the look included in the versions vary, as well as the licence for what the software can be used for.
- The office includes Word(Word processing), Excel(Spreadsheet), and Power point(Presentation).

2. OPEN OFFICE

- Open Office is the productivity software suite that is totally free and completely compatible with other office programs.



2. OPEN OFFICE

- Open Office is the productivity software suite that is totally free and completely compatible with other office programs.
- Without paying money one can download productivity software that includes a database, spreadsheet and word processor, all with comparable features with MS Office suite of programs.



2. OPEN OFFICE

- Open Office is the productivity software suite that is totally free and completely compatible with other office programs.
- Without paying money one can download productivity software that includes a database, spreadsheet and word processor, all with comparable features with MS Office suite of programs.
- Open Office files are compatible with office files and the program also eliminates the need for buying more privacy productive software as the writer program allows you to save documents using '.pdf' file extension.



- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- 3 Database Software :- Microsoft Access, MySQL etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- 3 Database Software :- Microsoft Access, MySQL etc.
- 4 Presentation Software :- Power point, Impress, etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- 3 Database Software :- Microsoft Access, MySQL etc.
- 4 Presentation Software :- Power point, Impress, etc.
- 5 Desktop Publishing :- Adobe Page maker, Open Office Draw, etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- 3 Database Software :- Microsoft Access, MySQL etc.
- 4 Presentation Software :- Power point, Impress, etc.
- 5 Desktop Publishing :- Adobe Page maker, Open Office Draw, etc.
- 6 Personal Finance Software :- Microsoft Money, Intuit Quicken, etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- 3 Database Software :- Microsoft Access, MySQL etc.
- 4 Presentation Software :- Power point, Impress, etc.
- 5 Desktop Publishing :- Adobe Page maker, Open Office Draw, etc.
- 6 Personal Finance Software :- Microsoft Money, Intuit Quicken, etc.
- 7 Speech Recognition Software :- Brainia, Speechnotes, Speech assistant, etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- 3 Database Software :- Microsoft Access, MySQL etc.
- 4 Presentation Software :- Power point, Impress, etc.
- 5 Desktop Publishing :- Adobe Page maker, Open Office Draw, etc.
- 6 Personal Finance Software :- Microsoft Money, Intuit Quicken, etc.
- 7 Speech Recognition Software :- Braina, Speechnotes, Speech assistant, etc.
- 8 Digital Image Editing Software :- Adobe Photoshop, Gimp, etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- 3 Database Software :- Microsoft Access, MySQL etc.
- 4 Presentation Software :- Power point, Impress, etc.
- 5 Desktop Publishing :- Adobe Page maker, Open Office Draw, etc.
- 6 Personal Finance Software :- Microsoft Money, Intuit Quicken, etc.
- 7 Speech Recognition Software :- Brainia, Speechnotes, Speech assistant, etc.
- 8 Digital Image Editing Software :- Adobe Photoshop, Gimp, etc.
- 9 Digital Audio software :- Audacity, Power Sound Editor, Wave Pad, etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- 3 Database Software :- Microsoft Access, MySQL etc.
- 4 Presentation Software :- Power point, Impress, etc.
- 5 Desktop Publishing :- Adobe Page maker, Open Office Draw, etc.
- 6 Personal Finance Software :- Microsoft Money, Intuit Quicken, etc.
- 7 Speech Recognition Software :- Braina, Speechnotes, Speech assistant, etc.
- 8 Digital Image Editing Software :- Adobe Photoshop, Gimp, etc.
- 9 Digital Audio software :- Audacity, Power Sound Editor, Wave Pad, etc.
- 10 Digital Video Editing Software :- Microsoft Moviemaker, Edius, Virtual Dub, Wondershare Filmora, etc.

- 1 Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- 2 Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- 3 Database Software :- Microsoft Access, MySQL etc.
- 4 Presentation Software :- Power point, Impress, etc.
- 5 Desktop Publishing :- Adobe Page maker, Open Office Draw, etc.
- 6 Personal Finance Software :- Microsoft Money, Intuit Quicken, etc.
- 7 Speech Recognition Software :- Brainia, Speechnotes, Speech assistant, etc.
- 8 Digital Image Editing Software :- Adobe Photoshop, Gimp, etc.
- 9 Digital Audio software :- Audacity, Power Sound Editor, Wave Pad, etc.
- 10 Digital Video Editing Software :- Microsoft Moviemaker, Edius, Virtual Dub, Wondershare Filmora, etc.
- 11 Drawing Software :- Gimp, Inkscape, Corel draw, Autocad, etc.

- ① Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- ② Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- ③ Database Software :- Microsoft Access, MySQL etc.
- ④ Presentation Software :- Power point, Impress, etc.
- ⑤ Desktop Publishing :- Adobe Page maker, Open Office Draw, etc.
- ⑥ Personal Finance Software :- Microsoft Money, Intuit Quicken, etc.
- ⑦ Speech Recognition Software :- Brainia, Speechnotes, Speech assistant, etc.
- ⑧ Digital Image Editing Software :- Adobe Photoshop, Gimp, etc.
- ⑨ Digital Audio software :- Audacity, Power Sound Editor, Wave Pad, etc.
- ⑩ Digital Video Editing Software :- Microsoft Moviemaker, Edius, Virtual Dub, Wondershare Filmora, etc.
- ⑪ Drawing Software :- Gimp, Inkscape, Corel draw, Autocad, etc.
- ⑫ Business Software :- Timecamp, Windward, etc.

- ① Word Processing Software :- Microsoft Word, Open Office Writer, etc.
- ② Spreadsheet software :- Microsoft Excel, Open Office Calc, etc.
- ③ Database Software :- Microsoft Access, MySQL etc.
- ④ Presentation Software :- Power point, Impress, etc.
- ⑤ Desktop Publishing :- Adobe Page maker, Open Office Draw, etc.
- ⑥ Personal Finance Software :- Microsoft Money, Intuit Quicken, etc.
- ⑦ Speech Recognition Software :- Brainia, Speechnotes, Speech assistant, etc.
- ⑧ Digital Image Editing Software :- Adobe Photoshop, Gimp, etc.
- ⑨ Digital Audio software :- Audacity, Power Sound Editor, Wave Pad, etc.
- ⑩ Digital Video Editing Software :- Microsoft Moviemaker, Edius, Virtual Dub, Wondershare Filmora, etc.
- ⑪ Drawing Software :- Gimp, Inkscape, Corel draw, Autocad, etc.
- ⑫ Business Software :- Timecamp, Windward, etc.

DATABASE

Database is a collection of information and their articles that are organised so that it can easily be accessed, managed and updated.

Rijoy K



DATABASE

Database is a collection of information and their articles that are organised so that it can easily be accessed, managed and updated.

WHY HAVE SCIENTIFIC DATA BASES?

- Improvement of data quality
 - Multiple users provide multiple opportunities for detecting and correcting problems in data.



DATABASE

Database is a collection of information and their articles that are organised so that it can easily be accessed, managed and updated.

WHY HAVE SCIENTIFIC DATA BASES?

- Improvement of data quality
 - Multiple users provide multiple opportunities for detecting and correcting problems in data.
- Cost
 - Data costs less to save than to collect again.
 - With environmental data, often data cannot be collected again at any cost.



NEW SCIENCE

- Long Term :- Long term studies depend on databases to retain project history
- Synthesis :- Use of data for a purpose other than for which it was collected.
- Integrated multidisciplinary projects :- depend on databases to facilitate sharing of data.

Rijoy



NEW SCIENCE

- Long Term :- Long term studies depend on databases to retain project history
- Synthesis :- Use of data for a purpose other than for which it was collected.
- Integrated multidisciplinary projects :- depend on databases to facilitate sharing of data.

ENVIRONMENTAL POLICY AND MANAGEMENT

- Environmental policy decisions require data that are regional or national, but most ecological data is collected at smaller scales
- Numerous federal initiatives.
 - NII - National information infrastructure
 - FGDC - Federal geographic data committee.
 - Environmental 'Report Card'.

CHALLENGES FOR SCIENTIFIC DATABASES

LONG TERM PERSPECTIVE

- Without databases, most data do not outlive project that collected them.



CHALLENGES FOR SCIENTIFIC DATABASES

LONG TERM PERSPECTIVE

- Without databases, most data do not outlive project that collected them.
- Goal :- Data that is accessible and interpretable 20 years in the future.
 - Technological need persistent media that does not become technologically obsolete.
 - Contextual need to capture context of data collection.
 - Semantic -terms need to be well-defined.



DEAL WITH DIVERSITY

- Science means asking new questions - new kinds of queries.



DEAL WITH DIVERSITY

- Science means asking new questions - new kinds of queries.
- Scientific data is heterogeneous and diverse.



DEAL WITH DIVERSITY

- Science means asking new questions - new kinds of queries.
- Scientific data is heterogeneous and diverse.
- Scientific users have different backgrounds and goals.



DEAL WITH DIVERSITY

- Science means asking new questions - new kinds of queries.
- Scientific data is heterogeneous and diverse.
- Scientific users have different backgrounds and goals.
- The user community for a given database will be dynamic.



DATABASE CHARACTERISTICS

A scientific database should be sufficiently wide and deep with their own characteristics.



DATABASE CHARACTERISTICS

A scientific database should be sufficiently wide and deep with their own characteristics.

- Deep Databases.
 - Relatively few kinds of data.
 - Large number of Observations.
 - Sophisticated query and analysis tools.



DATABASE CHARACTERISTICS

A scientific database should be sufficiently wide and deep with their own characteristics.

- Deep Databases.
 - Relatively few kinds of data.
 - Large number of Observations.
 - Sophisticated query and analysis tools.
- Wide Databases
 - Many different types of data.
 - Smaller number of observations of each type.
 - Few analysis tools



LARGE DATABASES

- GENBANK :- Genetic sequence data.

Rijoy



LARGE DATABASES

- GENBANK :- Genetic sequence data.
- PDB :- Protein structure database. It contains more than 6000 atomic coordinate entries.

Rijoy



LARGE DATABASES

- GENBANK :- Genetic sequence data.
- PDB :- Protein structure database. It contains more than 6000 atomic coordinate entries.

Rijoy



LARGE DATABASES

- GENBANK :- Genetic sequence data.
- PDB :- Protein structure database. It contains more than 6000 atomic coordinate entries.

CHARACTERISTICS

- They need large funding as much as \$ 1million/year.



LARGE DATABASES

- GENBANK :- Genetic sequence data.
- PDB :- Protein structure database. It contains more than 6000 atomic coordinate entries.

CHARACTERISTICS

- They need large funding as much as \$ 1million/year.
- Excellent examples of need for database solutions that scale.



LARGE DATABASES

- GENBANK :- Genetic sequence data.
- PDB :- Protein structure database. It contains more than 6000 atomic coordinate entries.

CHARACTERISTICS

- They need large funding as much as \$ 1million/year.
- Excellent examples of need for database solutions that scale.
- Substantial focus on specialised tools and storage.



LARGE DATABASES

- GENBANK :- Genetic sequence data.
- PDB :- Protein structure database. It contains more than 6000 atomic coordinate entries.

CHARACTERISTICS

- They need large funding as much as \$ 1million/year.
- Excellent examples of need for database solutions that scale.
- Substantial focus on specialised tools and storage.



SPECIALISED DATABASES

- MUSE :-specialised software for managing herbarium specimens.

Rijoy



SPECIALISED DATABASES

- MUSE :-specialised software for managing herbarium specimens.
- BIOTA :- Management of specimen-based biodiversity data.

Rijoy



SPECIALISED DATABASES

- MUSE :-specialised software for managing herbarium specimens.
- BIOTA :- Management of specimen-based biodiversity data.
- GIS :- Geographical Information System.

Rijoy



SPECIALISED DATABASES

- MUSE :-specialised software for managing herbarium specimens.
- BIOTA :- Management of specimen-based biodiversity data.
- GIS :- Geographical Information System.

CHARACTERISTICS

- Software commercially available.



SPECIALISED DATABASES

- MUSE :-specialised software for managing herbarium specimens.
- BIOTA :- Management of specimen-based biodiversity data.
- GIS :- Geographical Information System.

CHARACTERISTICS

- Software commercially available.
- Used by a variety of institutions and investigators.



LTER SITES

LONG TERM ECOLOGICAL RESEARCH

- Approximately 15% of site funding.
- Focus on long term data
- Diverse approaches to data management at different sites dictated by



LTER SITES

LONG TERM ECOLOGICAL RESEARCH

- Approximately 15% of site funding.
- Focus on long term data
- Diverse approaches to data management at different sites dictated by
 - Locations of researchers
 - Types of data collected
- Testbed for “Practical data management”



WWW SITES

WWW PAGES OF INDIVIDUAL RESEARCHERS OR RESEARCH PROJECTS

- Can provide access to data.



WWW SITES

WWW PAGES OF INDIVIDUAL RESEARCHERS OR RESEARCH PROJECTS

- Can provide access to data.
- Typically do not utilise standards for metadata(documentation).



WWW SITES

WWW PAGES OF INDIVIDUAL RESEARCHERS OR RESEARCH PROJECTS

- Can provide access to data.
- Typically do not utilise standards for metadata(documentation).
- Typically provide no query tools.



HOW TO EVOLVE A DATABASE

- Development of a database is an evolutionary process.



HOW TO EVOLVE A DATABASE

- Development of a database is an evolutionary process.
- Implement system based on current priorities- but think ahead.



HOW TO EVOLVE A DATABASE

- Development of a database is an evolutionary process.
- Implement system based on current priorities- but think ahead.
- Seek scalable solutions.
 - Avoid bottlenecks
 - Adding the 1000th piece of data should be as easy as adding the first(or easier).



DEVELOPING A DATABASE

MAJOR CONSIDERATIONS

- Why is this database **needed**?



DEVELOPING A DATABASE

MAJOR CONSIDERATIONS

- Why is this database **needed**?
- Who will be the **users** of the database.



DEVELOPING A DATABASE

MAJOR CONSIDERATIONS

- Why is this database **needed**?
- Who will be the **users** of the database.
- What types of **questions** should be able to answer.



DEVELOPING A DATABASE

MAJOR CONSIDERATIONS

- Why is this database **needed**?
- Who will be the **users** of the database.
- What types of **questions** should be able to answer.
- What **incentives** will be available for data providers.



LIBRARY MODEL

- Individual Library with 20 books - it can be just put randomly on shelves.



LIBRARY MODEL

- Individual Library with 20 books - it can be just put randomly on shelves.
- Individual library with 500 books - we need to sort books on shelves based on topic or alphabetically.



LIBRARY MODEL

- Individual Library with 20 books - it can be just put randomly on shelves.
- Individual library with 500 books - we need to sort books on shelves based on topic or alphabetically.
- Library :-
 - Complex cataloguing system.
 - Controlled keyword and subject vocabularies.



LIBRARY MODEL

- Individual Library with 20 books - it can be just put randomly on shelves.
- Individual library with 500 books - we need to sort books on shelves based on topic or alphabetically.
- Library :-
 - Complex cataloguing system.
 - Controlled keyword and subject vocabularies.

For these problems the best solution is to choose a database.



DBMS

THINGS TO BE CONSIDERED

- What tasks do you want the DBMS to accomplish.



DBMS

THINGS TO BE CONSIDERED

- What tasks do you want the DBMS to accomplish.
 - Query
 - Sorting
 - Analysis



DBMS

THINGS TO BE CONSIDERED

- What tasks do you want the DBMS to accomplish.
 - Query
 - Sorting
 - Analysis
- Is there a type of DBMS whose structure best mirrors that of the underlying data.



DBMS TYPES

FILE SYSTEM BASED

- Simple
- Inefficient
- Few capabilities

Rijoy



DBMS TYPES

FILE SYSTEM BASED

- Simple
- Inefficient
- Few capabilities

HIERARCHICAL

- Phylogenetic structures. Geographical images.



DBMS TYPES

FILE SYSTEM BASED

- Simple
- Inefficient
- Few capabilities

HIERARCHICAL

- Phylogenetic structures. Geographical images.

NETWORK

- Very flexible
- Not widely used.

DBMS TYPES - CONTD..

RELATIONAL

- Widely used and mature
- Table oriented
- Restricted range of structures

Rijoy



DBMS TYPES - CONTD..

RELATIONAL

- Widely used and mature
- Table oriented
- Restricted range of structures

OBJECTED ORIENTED

- Developing a few commercial implementations
- Diverse structures
- Extensible.



ADVANTAGES AND DISADVANTAGES OF USING A DBMS

ADVANTAGES

- Additional capabilities.
 - Sorting
 - Query
 - Integrity checking.



ADVANTAGES AND DISADVANTAGES OF USING A DBMS

ADVANTAGES

- Additional capabilities.
 - Sorting
 - Query
 - Integrity checking.
- Easy access to data.

DISADVANTAGES

- Few graphical or statistical capabilities.
- Proprietary formats may limit archival quality of data.
- Require expertise and resources to administer.

METADATA

Metadata is nothing but **Data about Data**.

- Even if you decide not to use a DBMS for data, you want to use one for Metadata.
- Most data is located based on searching metadata rather than the data itself.
- Metadata is changed more often than data.



COMPUTER SYSTEMS USED

UNIX SYSTEMS

- Mature full functional system. Reasons:
 - Strong on multitasking.
 - More reliable and robust.
- Steep learning curve.
- Software inexpensive.
- Lots of free software.
- Wide array of WWW tools.

RJOY K.J.



COMPUTER SYSTEMS USED

UNIX SYSTEMS

- Mature full functional system. Reasons:
 - Strong on multitasking.
 - More reliable and robust.
- Steep learning curve.
- Software inexpensive.
- Lots of free software.
- Wide array of WWW tools.

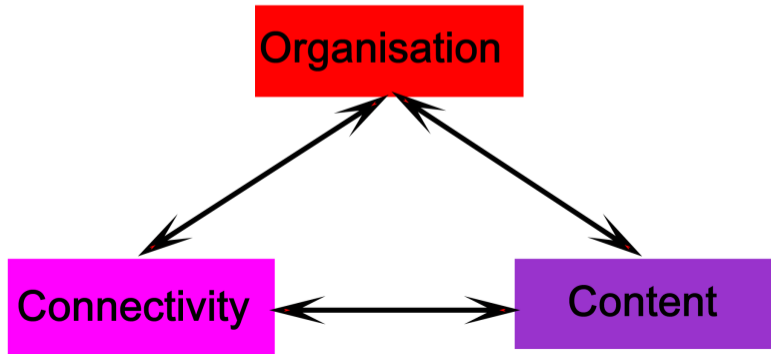
PCs AND MAC

- Rapid improvements in operating system design to facilitate network access.
- Software and Hardware expensive.
- Tools are more user friendly.
- Number of tools rapidly growing.



CONCLUSION

- Scientific databases are increasingly settling the boundaries for science itself.
- Databases evolve, but they don't spontaneously generate.
- Since it is an asset for the humanity, each individual is responsible for their contribution.



EDUCATIONAL DATA BASES

- Educational databases will help us to find high-quality and up-to-date journals that have been published by respective publishers and publications we can search using keywords or concepts travelling to your research topic and combine the keywords using the Boolean operators AND, OR and NOT.



EDUCATIONAL DATA BASES

- Educational databases will help us to find high-quality and up-to-date journals that have been published by respective publishers and publications we can search using keywords or concepts travelling to your research topic and combine the keywords using the Boolean operators AND, OR and NOT.
- They provide access to high quality peer-reviewed journal articles, conference proceedings, book chapters, dissertations and other sources.

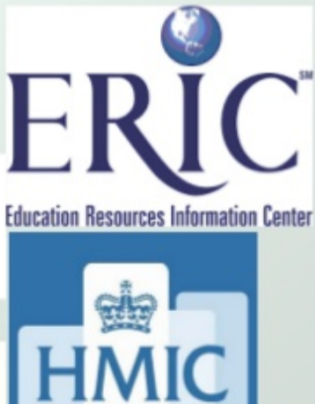


Educational databases includes over 1,000 full text journals and 18000 dissertations supporting the research on the theory and practice of education and they cover not only the literature on primary, secondary and higher education but also special education, homeschooling, adult education and hundreds of related topics.



IMPORTANT EDUCATIONAL DATABASES

Key Databases of Education



WEB OF SCIENCE



1. EDUCATIONAL SOURCE

- Education source covers all levels of education from early childhood to higher education as well as all education specialities such as multilingual education health education and testing.



1. EDUCATIONAL SOURCE

- Education source covers all levels of education from early childhood to higher education as well as all education specialities such as multilingual education health education and testing.
- The database is a compilation of previous education databases specifically education in the prospective education abstracts full text and research complete.



- It supplies more than 1700 journals, 200 extra full-text journals and 550 plus books.



- It supplies more than 1700 journals, 200 extra full-text journals and 550 plus books.
- Also included are conference papers, article citations and links to some ERIC documents.



- It supplies more than 1700 journals, 200 extra full-text journals and 550 plus books.
- Also included are conference papers, article citations and links to some ERIC documents.
- Subjects covered include adult and continuing education, distance learning, government funding multicultural/ethnic education social issues, student counselling, vocational education and many more.



- It supplies more than 1700 journals, 200 extra full-text journals and 550 plus books.
- Also included are conference papers, article citations and links to some ERIC documents.
- Subjects covered include adult and continuing education, distance learning, government funding multicultural/ethnic education social issues, student counselling, vocational education and many more.
- It is the world's largest and most complete collection of full text education journals with many peer reviewed titles.



ERIC

- The Educational Resources Information Centre(ERIC) is an online digital library of education research and information.
- It is sponsored by the institute of education sciences of the United States Department of education.



ERIC

- The Educational Resources Information Centre(ERIC) is an online digital library of education research and information.
- It is sponsored by the institute of education sciences of the United States Department of education.
- The mission of is to provide comprehensive easy-to-use searchable internet-based bibliography and full-text database of education research and information for educated researches and the general public.



ERIC

- The Educational Resources Information Centre(ERIC) is an online digital library of education research and information.
- It is sponsored by the institute of education sciences of the United States Department of education.
- The mission of is to provide comprehensive easy-to-use searchable internet-based bibliography and full-text database of education research and information for educated researches and the general public.
- Education research and information are essential for improving teaching, planning and educational decision making.



- ERIC provides access to 1.5 million bibliographic records (citations, abstracts and other pertinent data of journal articles and other education related materials with the hundreds of new records added every week.



- ERIC provides access to 1.5 million bibliographic records (citations, abstracts and other pertinent data of journal articles and other education related materials with the hundreds of new records added every week.
- A key component of ERIC is its collection of grey literature in education is largely available in full text in Adobe PDF format.



- ERIC provides access to 1.5 million bibliographic records (citations, abstracts and other pertinent data of journal articles and other education related materials with the hundreds of new records added every week.
- A key component of ERIC is its collection of grey literature in education is largely available in full text in Adobe PDF format.
- ERIC collection begun in 1966 contains records for a variety of publication types including journal articles books, research synthesis, conference papers, technical reports, dissertations, policy papers and other education related materials.



3. EDUCATIONAL RESEARCH COMPLETE

- Education Research Complete offers the world's largest and most complete collection of full text education journals.

3. EDUCATIONAL RESEARCH COMPLETE

- Education Research Complete offers the world's largest and most complete collection of full text education journals.
- It is a bibliographic and full-text database covering scholarly research and information relating to all areas of education.

3. EDUCATIONAL RESEARCH COMPLETE

- Education Research Complete offers the world's largest and most complete collection of full text education journals.
- It is a bibliographic and full-text database covering scholarly research and information relating to all areas of education.
- The database provides indexing and abstracts for more than 2150 journals as well as full text or nearly 1,200 journals.

3. EDUCATIONAL RESEARCH COMPLETE

- Education Research Complete offers the world's largest and most complete collection of full text education journals.
- It is a bibliographic and full-text database covering scholarly research and information relating to all areas of education.
- The database provides indexing and abstracts for more than 2150 journals as well as full text or nearly 1,200 journals.
- This database also includes full text for more than 500 books and monographs and full text for numerous education related conference papers.

3. EDUCATIONAL RESEARCH COMPLETE

- Education Research Complete offers the world's largest and most complete collection of full text education journals.
- It is a bibliographic and full-text database covering scholarly research and information relating to all areas of education.
- The database provides indexing and abstracts for more than 2150 journals as well as full text or nearly 1,200 journals.
- This database also includes full text for more than 500 books and monographs and full text for numerous education related conference papers.
- Topics includes administration policy funding and social issues in addition to the journal content, some full textbooks, conference papers and other documents are available.

BRITISH EDUCATION INDEX

- British Education Index is designed to aid identification of appropriate literature by people investigating aspects of education and training.



BRITISH EDUCATION INDEX

- British Education Index is designed to aid identification of appropriate literature by people investigating aspects of education and training.
- It provides details of over 300 education and training related journals published in the UK from 1976 onwards covering all areas of education from education policy and administration to technology and special educational needs.



BRITISH EDUCATION INDEX

- British Education Index is designed to aid identification of appropriate literature by people investigating aspects of education and training.
- It provides details of over 300 education and training related journals published in the UK from 1976 onwards covering all areas of education from education policy and administration to technology and special educational needs.
- Publications include journal articles, some chapters from monographs, reports and internet resources.



BRITISH EDUCATION INDEX

- British Education Index is designed to aid identification of appropriate literature by people investigating aspects of education and training.
- It provides details of over 300 education and training related journals published in the UK from 1976 onwards covering all areas of education from education policy and administration to technology and special educational needs.
- Publications include journal articles, some chapters from monographs, reports and internet resources.
- British education thesis are included also but only from 1950 to 1990.



5. TEACHER REFERENCE CENTRE

- Teacher Reference Centre indexes abstract citations and full-text articles from 280 periodicals.



5. TEACHER REFERENCE CENTRE

- Teacher Reference Centre indexes abstract citations and full-text articles from 280 periodicals.
- In addition most of the journals indexed in the database are peer reviewed.



5. TEACHER REFERENCE CENTRE

- Teacher Reference Centre indexes abstract citations and full-text articles from 280 periodicals.
- In addition most of the journals indexed in the database are peer reviewed.
- Teacher reference centre provides many subjects for teachers needs including assessment, best practices, continuing education, current pedagogical research, curriculum development, elementary education, higher education, instructional media, language, arts, literacy standards, school administration, science and mathematics and teacher education.



5. TEACHER REFERENCE CENTRE

- Teacher Reference Centre indexes abstract citations and full-text articles from 280 periodicals.
- In addition most of the journals indexed in the database are peer reviewed.
- Teacher reference centre provides many subjects for teachers needs including assessment, best practices, continuing education, current pedagogical research, curriculum development, elementary education, higher education, instructional media, language, arts, literacy standards, school administration, science and mathematics and teacher education.



6. MEDLINE

- Medline (Medical Literature Analysis and Retrieval System Online or MEDLARS online) is a bibliographic database of life sciences and biomedical information.



6. MEDLINE

- Medline (Medical Literature Analysis and Retrieval System Online or MEDLARS online) is a bibliographic database of life sciences and biomedical information.
- It includes bibliographic information for articles from academic journals covering medicines, nursing, pharmacy, dentistry, veterinary medicine and health care.



6. MEDLINE

- Medline (Medical Literature Analysis and Retrieval System Online or MEDLARS online) is a bibliographic database of life sciences and biomedical information.
- It includes bibliographic information for articles from academic journals covering medicines, nursing, pharmacy, dentistry, veterinary medicine and health care.
- Medline also covers much of the literature in biology and biochemistry as well as fields such as molecular evolution.



- The database contains more than 26 million records from 5639 selected publications covering biomedicine and health from 1950 to the present.



- The database contains more than 26 million records from 5639 selected publications covering biomedicine and health from 1950 to the present.
- Originally the database covered articles starting from 1965 but this has been enhanced and records as far back as 1950/51 are now available within the main Index.



- The database contains more than 26 million records from 5639 selected publications covering biomedicine and health from 1950 to the present.
- Originally the database covered articles starting from 1965 but this has been enhanced and records as far back as 1950/51 are now available within the main Index.
- Medline functions as an important resource for biomedical resources and journal clubs from all over the world.



- The database contains more than 26 million records from 5639 selected publications covering biomedicine and health from 1950 to the present.
- Originally the database covered articles starting from 1965 but this has been enhanced and records as far back as 1950/51 are now available within the main Index.
- Medline functions as an important resource for biomedical resources and journal clubs from all over the world.
- Most systematic review articles published personally build on extensive researches of medline to identify articles that might be useful in the preview.



- The database contains more than 26 million records from 5639 selected publications covering biomedicine and health from 1950 to the present.
- Originally the database covered articles starting from 1965 but this has been enhanced and records as far back as 1950/51 are now available within the main Index.
- Medline functions as an important resource for biomedical resources and journal clubs from all over the world.
- Most systematic review articles published personally build on extensive researches of medline to identify articles that might be useful in the preview.
- Medline influences researchers in the choice of journals in which to publish.



WEB OF SCIENCE

- Web of Science, previously known as the Web of Knowledge is an online subscription based scientific citation indexing service maintained by Thomson Reuters that provides a comprehensive citation search.

Rijoy



WEB OF SCIENCE

- Web of Science, previously known as the Web of Knowledge is an online subscription based scientific citation indexing service maintained by Thomson Reuters that provides a comprehensive citation search.
- It gives access to multiple databases that reference cross-disciplinary research which allows for in-depth exploration of specialised subfields within an academic or scientific discipline.

Rijoy



WEB OF SCIENCE

- Web of Science, previously known as the Web of Knowledge is an online subscription based scientific citation indexing service maintained by Thomson Reuters that provides a comprehensive citation search.
- It gives access to multiple databases that reference cross-disciplinary research which allows for in-depth exploration of specialised subfields within an academic or scientific discipline.
- Search for journal articles using three databases, science citation index, social science citation index, and arts and humanities citation index.



WEB OF SCIENCE

- Web of Science, previously known as the Web of Knowledge is an online subscription based scientific citation indexing service maintained by Thomson Reuters that provides a comprehensive citation search.
- It gives access to multiple databases that reference cross-disciplinary research which allows for in-depth exploration of specialised subfields within an academic or scientific discipline.
- Search for journal articles using three databases, science citation index, social science citation index, and arts and humanities citation index.
- A current awareness service provides citation alerts for newly added journal articles.



WEB OF SCIENCE

- Web of Science, previously known as the Web of Knowledge is an online subscription based scientific citation indexing service maintained by Thomson Reuters that provides a comprehensive citation search.
- It gives access to multiple databases that reference cross-disciplinary research which allows for in-depth exploration of specialised subfields within an academic or scientific discipline.
- Search for journal articles using three databases, science citation index, social science citation index, and arts and humanities citation index.
- A current awareness service provides citation alerts for newly added journal articles.
- Each database is updated weekly.



NATIONAL DIGITAL LIBRARY OF INDIA

- Educational materials available from Primary to Postgraduate levels.

Rijoy K.J.



NATIONAL DIGITAL LIBRARY OF INDIA

- Educational materials available from Primary to Postgraduate levels.
- Educational materials available for all subject areas like Technology, Social Science, Literature, Law, Medical, etc.

Rijoy K.J.



NATIONAL DIGITAL LIBRARY OF INDIA

- Educational materials available from Primary to Postgraduate levels.
- Educational materials available for all subject areas like Technology, Social Science, Literature, Law, Medical, etc.
- All types of resources, such as Books, Audio Books/Lectures, Video lectures, Lecture Presentations/Notes, Simulations, Question Papers, Solutions, etc. available.

Rijoy K?



NATIONAL DIGITAL LIBRARY OF INDIA

- Educational materials available from Primary to Postgraduate levels.
- Educational materials available for all subject areas like Technology, Social Science, Literature, Law, Medical, etc.
- All types of resources, such as Books, Audio Books/Lectures, Video lectures, Lecture Presentations/Notes, Simulations, Question Papers, Solutions, etc. available.
- Huge volume of Educational materials authored by large number of authors available.

Rijoy K?



NATIONAL DIGITAL LIBRARY OF INDIA

- Educational materials available from Primary to Postgraduate levels.
- Educational materials available for all subject areas like Technology, Social Science, Literature, Law, Medical, etc.
- All types of resources, such as Books, Audio Books/Lectures, Video lectures, Lecture Presentations/Notes, Simulations, Question Papers, Solutions, etc. available.
- Huge volume of Educational materials authored by large number of authors available.
- Content of all languages available. User interface available in widely used Indian languages.



NATIONAL DIGITAL LIBRARY OF INDIA

- Educational materials available from Primary to Postgraduate levels.
- Educational materials available for all subject areas like Technology, Social Science, Literature, Law, Medical, etc.
- All types of resources, such as Books, Audio Books/Lectures, Video lectures, Lecture Presentations/Notes, Simulations, Question Papers, Solutions, etc. available.
- Huge volume of Educational materials authored by large number of authors available.
- Content of all languages available. User interface available in widely used Indian languages.
- Library integrates contents from Institutional Digital Repositories of large number of Indian Educational and Research institutions.



INFLIBNET

- **Information and Library Network** is a national program initiated by UGC since 1991.



INFLIBNET

- **Information and Library Network** is a national program initiated by UGC since 1991.
- It is involved in modernizing university libraries in India using the state-of-art technologies for the optimum utilisation of information.



INFLIBNET

- **Information and Library Network** is a national program initiated by UGC since 1991.
- It is involved in modernizing university libraries in India using the state-of-art technologies for the optimum utilisation of information.
- The main objective is to promote and establish communication facilities to improve capability in information transfer and access, that provide support to scholarship, learning, research and academic pursuit through cooperation and involvement of agencies concerned.



INFLIBNET CONTINUED.

- It envisages:
 - Interlinking of libraries and information centres of various educational institutions, institutions of national importance, and R&D institutions.

Rijoy K.J.



INFLIBNET CONTINUED.

- It envisages:
 - Interlinking of libraries and information centres of various educational institutions, institutions of national importance, and R&D institutions.
 - Facilitate pooling, sharing, and exchange of information and resources.

Rijoy K. J.



INFLIBNET CONTINUED.

- It envisages:
 - Interlinking of libraries and information centres of various educational institutions, institutions of national importance, and R&D institutions.
 - Facilitate pooling, sharing, and exchange of information and resources.
 - Provide access to bibliographic informations with citations, abstracts, etc.



INFLIBNET CONTINUED.

- It envisages:
 - Interlinking of libraries and information centres of various educational institutions, institutions of national importance, and R&D institutions.
 - Facilitate pooling, sharing, and exchange of information and resources.
 - Provide access to bibliographic informations with citations, abstracts, etc.
 - Creation of databases of projects, institutions, specialists, for providing on-line information service.



INFLIBNET CONTINUED.

- It envisages:
 - Interlinking of libraries and information centres of various educational institutions, institutions of national importance, and R&D institutions.
 - Facilitate pooling, sharing, and exchange of information and resources.
 - Provide access to bibliographic informations with citations, abstracts, etc.
 - Creation of databases of projects, institutions, specialists, for providing on-line information service.
 - facilitation of academic communication amongst scientist, engineers, social scientists, academics, faculties, researchers and students through electronic mail, file transfer, computer/audio/video conferencing, etc.



OTHER EDUCATIONAL DATABASES

- Shodganga :- A reservoir for Indian Theses. It provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. The repository has the ability to capture, index, store, disseminate and preserve ETDs submitted by the researchers.

Rijoy V J



OTHER EDUCATIONAL DATABASES

- Shodganga :- A reservoir for Indian Theses. It provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. The repository has the ability to capture, index, store, disseminate and preserve ETDs submitted by the researchers.
- Shodshuddhi : - Provides Plagiarism Detection Software to Institutions.



OTHER EDUCATIONAL DATABASES

- Shodganga :- A reservoir for Indian Theses. It provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. The repository has the ability to capture, index, store, disseminate and preserve ETDs submitted by the researchers.
- Shodshuddhi : - Provides Plagiarism Detection Software to Institutions.
- IRINS :- Research Information Management System for Institutions.



OTHER EDUCATIONAL DATABASES

- Shodganga :- A reservoir for Indian Theses. It provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. The repository has the ability to capture, index, store, disseminate and preserve ETDs submitted by the researchers.
- Shodshuddhi : - Provides Plagiarism Detection Software to Institutions.
- IRINS :- Research Information Management System for Institutions.
- Vidya-Mithra :- Integrated e-Content portal.



OTHER EDUCATIONAL DATABASES

- Shodganga :- A reservoir for Indian Theses. It provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. The repository has the ability to capture, index, store, disseminate and preserve ETDs submitted by the researchers.
- Shodshuddhi : - Provides Plagiarism Detection Software to Institutions.
- IRINS :- Research Information Management System for Institutions.
- Vidya-Mithra :- Integrated e-Content portal.
- Vidwan :- Expert Database and National Researcher Network.



OTHER EDUCATIONAL DATABASES

- Shodganga :- A reservoir for Indian Theses. It provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. The repository has the ability to capture, index, store, disseminate and preserve ETDs submitted by the researchers.
- Shodshuddhi : - Provides Plagiarism Detection Software to Institutions.
- IRINS :- Research Information Management System for Institutions.
- Vidya-Mithra :- Integrated e-Content portal.
- Vidwan :- Expert Database and National Researcher Network.



CONCLUSION

- Education Databases cover the outputs of educational institutions, the policy levers that shaped education outputs, the human and financial resources invested in education, structural characteristics of education systems and economic and social outcomes of education, learning and training throughout the life.

Rijoy



CONCLUSION

- Education Databases cover the outputs of educational institutions, the policy levers that shaped education outputs, the human and financial resources invested in education, structural characteristics of education systems and economic and social outcomes of education, learning and training throughout the life.
- Apart from the education database like ERIC Education Source and British International Index in the disciplinary databases like Google Scholar, Scopus, Jstore and OVID also enriches the students with their invaluable contributions.



CONCLUSION

- Education Databases cover the outputs of educational institutions, the policy levers that shaped education outputs, the human and financial resources invested in education, structural characteristics of education systems and economic and social outcomes of education, learning and training throughout the life.
- Apart from the education database like ERIC Education Source and British International Index in the disciplinary databases like Google Scholar, Scopus, Jstore and OVID also enriches the students with their invaluable contributions.
- Students who depend upon these education databases can achieve success because it makes education and knowledge more easier, loveable and achievable.

