BREEDING ARENA COLLEGE
Nurturing What's within
2021

BREEDING
A R E N A
College

THE BREEDER'S GUIDE

ICT

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Year Ten (SS1)

Term Cultivate 2024

Scheme of work

ICT		
Information & Communication Technology		Sept – Nov
WEEK	TOPIC	SUB-TOPICS
1	Introduction to Data Processing	What is computer processing Elements of computer processing…
2	History of computing	Mechanical counting devices Electro-mechanical devices
3	Generation of computers	First, Second, Third generation, Fourth and Fifth generation
4	Classification of computer by size	Four categories of a computer Uses of super computer
5	Classification of computers according to type	Digital, analogue, hybrid, and micro computers
6	Components of a computer system	The hardware The software(Operating system, Application software) The peripherals
7	Continuous assessment/Mid Term Break	
8	Input/Output Devices	Input devices Output devices Types of printers

WEEK	TOPIC	SUB-TOPICS
9	System Unit and Storage Devices	Internal and external storage devices
		Sub-categories of storage devices
		Uses of storage devices
10	Data and Information	Data
		Information
		Types of data
		Qualities of good information
11	Revision	
12	Examination	
13		
WEEK	TOPIC	SUB-TOPICS

1. INTRODUCTION TO DATA PROCESSING

Objective: By the end of this class, a student should be able to explain what is data and how it's used as a processing tool.

Duration: 40mins

Week: 1

Teaching Method/Strategy: Method

Entry Behavior (How you plan to start your Class): Question and Answers

Data

The term data means any basic fact which may be input into some processing system.

A processing system is one where computations, comparisons and general manipulation of data are done. The processing may be people or machines e.g. the computer.

Information, on the other hand, is the end – result of a processing system. The information is needed by management for decision-making.

What is data processing?

Data processing is the task of using a collection of basic facts to produce information, usually, it has no value in itself until it is subjected to analysis, validations and comparisons with other data to produce a result (information), for example, a collection of weights of individuals do not turn out useful information for decision making.

However, information is produced when the set of data is processed such as searching for an individual with a maximum or minimum weight or the weight of all concerned in the study, informat

ent can decide based on each piece of information to assign special duties to the fellow with the maximum or minimum weight. Other use could be made on such information depending upon the situation prevailing in the organisation and their special needs.

Therefore, data processing is an operation on computer data that involves the entering, sorting, updating and retrieving of information using a computer.
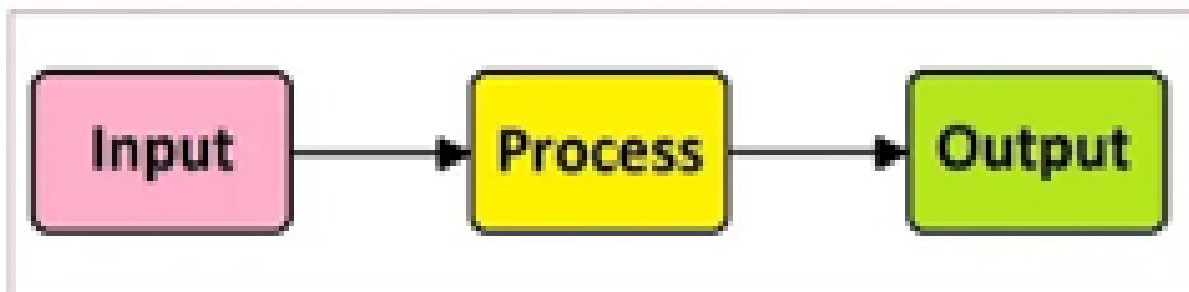
Properties of data

. Collected/Captured

. Prepared

. Presented

. Precise

. Complete

. Accurate

. Purposeful

. Assigned

Data processing cycle

The data processing cycle describes the stages of data processing. It involves the following stages:

1. Data gathering

2. Data collation

3. Input stage

4. Processing stage

5. Storage stage

6. Output stage

The element of data processing:

Data processing activities include:

Input: involves three steps; collection, verification/validation and coding.

Processing: involves classification, sorting, calculating, converting and storing.

Output: Involves retrieving, converting and communicating.

Input activity:

COLLECTION: involves gathering data from various sources and assembling it at one location.

VERIFICATION/VALIDATION: After data have been gathered, its accuracy and completeness must be checked. This is an important step that helps to eliminate the possibility of Garbage-In – Garbage-out (GIGO)

CODE: Data must be converted into a machine-readable form so that it can be entered into the processing system. Entering data via a computer terminal and keyboard is one example of coding.

Processing activity:

. CLASSIFICATION: Classification involves categorizing data according to certain characteristics to make it meaningful to the user. For example, sales data can be grouped according to the salesperson, product type, customer or any other classification useful to management.

. SORT: This involves arranging the grouped data element into a predetermined sequence to facilitate processing. For example, an employee number can be last. Sorting can be done on numbers, letters, special characters or a combination of them. After it has been classified, data may be stored.

. CALCULATION: The arithmetical or logical manipulation of data is referred to as calculation. Examples include the computation of students' grade-point averages, customers' bank balances and employees' wages.

. SUMMARISE: Reducing a large amount of data to a concise, usable form is called summarizing. The logical reduction of data is necessary to provide useful information.

. STORE: This involves the storing of data not immediately needed; data could be stored on a disk, tape or CD-ROM.

Output activity:

This involves retrieving data, printing data and data communication.

Importance of data processing

The art of management is increasing as our society becomes more competitive and more technologically advanced. The volume of data being generated is correspondingly increasing and becoming unmanageable. On the other hand, the need to make information available, timely and

accurate is becoming more vital in the competitive world in which we have found ourselves. It is when a large volume of data is required to be processed speedily and accurately that Data Processing becomes indispensable.

General self-evaluation

. What is data processing?

. Describe a typical data processing cycle.

. Describe what is involved in each stage of data processing.

. Why is the computer a better tool for data processing?

. Discuss why data processing is important in a business organization.

2. HISTORY OF COMPUTING

Objective: By the end of this class, a student should be able to state the history of computing
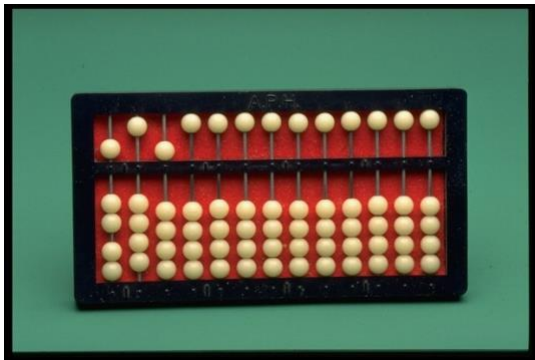
Duration: 40mins

Week: 2

Teaching Method/Strategy: Method

Entry Behavior (How you plan to start your Class): Question and Answers

MECHANICAL COUNTING AND CALCULATING DEVICES

1. Abacus

The first computer was called the Ancient counting machine. The fIrst computer was called the Abacus counting machine. Abacus can be used for addition, subtraction, division and multiplication.

2. Slide Rule

Slide Rule is a ruler that functions as a mechanical analogue computer used for computing multiplication or division, roots, logarithms, and the result of trigonometric functions. It is also called a slipstick.

ELECTRO-MECHANICAL COUNTING DEVICES

1. John Napier bone

In 1617 John Napier, a Scottish mathematician, invented Napier's bones. These were rods on which numbers were marked.

These numbers enable the user to easily work out the answers to a restricted set of multiplication tables. The numbers to be multiplied are positioned on the top row and the left column.

2. Blaise Pascal Machine

In 1642 Blaise Pascal invented the first calculating machine when he was 19 years old. This machine was developed to assist his father's work as a government auditor of accounts.
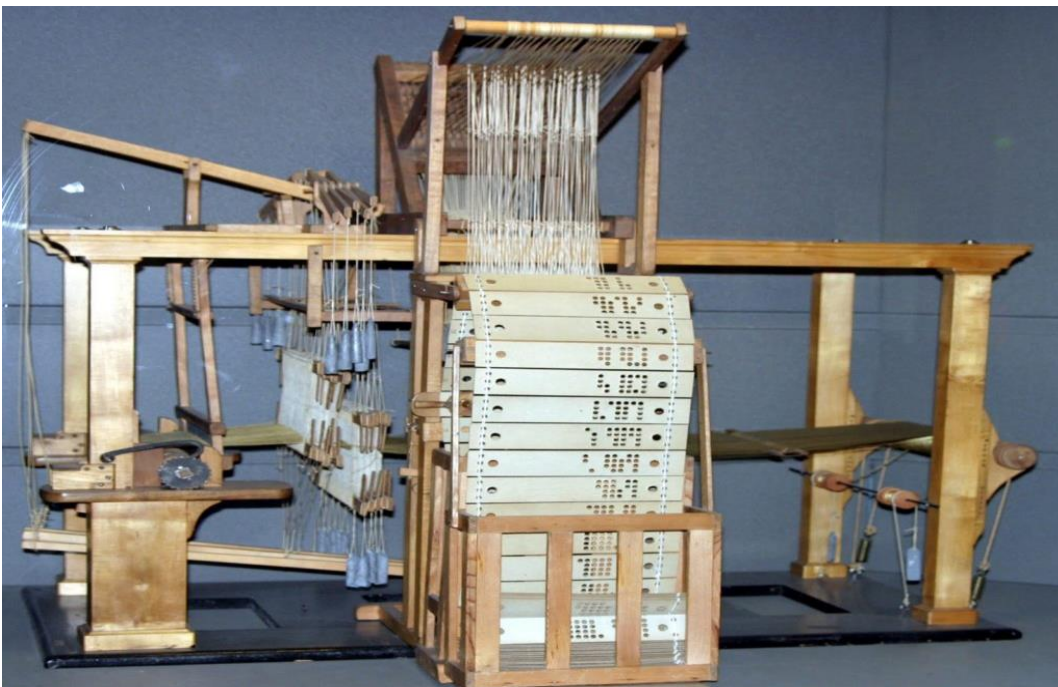
3. Gottfried Leibniz Machine

A famous German mathematician, Gottfried Von Leibniz made the most significant contribution to the mechanical calculator in 1671 when he invented the Leibniz calculating machine. The machine can perform 4 arithmetic operations.

4. Joseph Jacquard Loom

The Jacquard loom is a mechanical loom, invented by Joseph Marie Jacquard in 1800. The loom simplifies the process of manufacturing textiles with complex patterns such as brocade, damask, and matelasse.
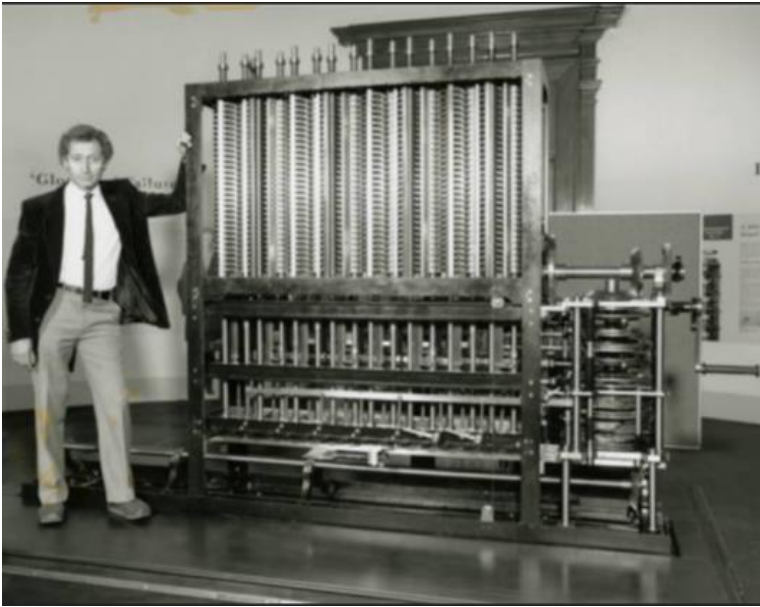
5. Charles Babbage Analytical Machine

Charles Babbage was a mathematics professor at Trinity College in Cambridge, England. After several unsuccessful attempts at building a mechanical calculating machine, Babbage developed the analytical engine in 1834.

6. Philip Emeagwali

Philip Emeagwali is a Nigerian-born engineer and computer scientist/geologist. He is called the Bill Gates of Africa. He invented the world's fastest computer. He was one of two winners of the 1989 Gordon Bell Prize, a prize from the IEEE, for his use of a Connection Machine supercomputer to help analyse petroleum Fields.

3. CLASSIFICATION OF COMPUTERS BY GENERATION

Duration: 40mins

Week: 3

Teaching Method/Strategy: Method

Entry Behaviour (How you plan to start your Class):
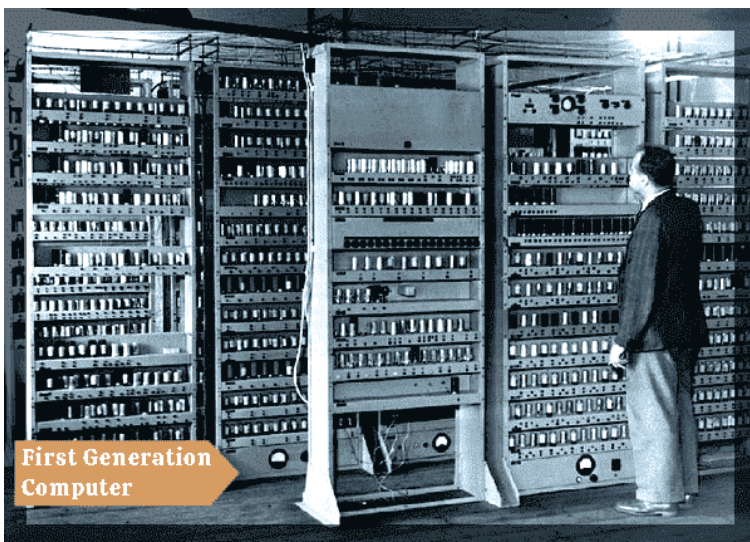
1. First Generation

First-generation computers are the first computers. They used vacuum tubes. The first generation needed much electricity before it could be used. They are slow and can only store little information.

The years of development – 1940 -1956

The technology speed of operation – Very slow Storage capacity – Magnetic Core as Primary Memory

Examples of First-Generation Computers

ENIAC (Electronic Numeric Integrated and Calculator) and UNIVAC (Universal Automatic Computer) are great examples of first-generation computers. The ENIAC was the first successful electronic computer, developed by J. Presper Eckert and J. W. Mauchly. On the other hand, UNIVAC was the first commercial computer invented by them. In 1951, UNIVAC was given to the US Census Bureau.

First Generation Computer

Note: The ENIAC was built using approximately 20,000 vacuum tubes, combined with about 10,000 capacitors and 70,000 resistors. A large room was needed to properly place it. The weight of this first-generation computer was measured at over 30 tons.

Some other examples of the first-generation computers are listed below:

• EDVAC

• EDSAC

• IBM-701

• IBM-650

° Manchester Mark 1, Mark 2, Mark 3, etc.

Characteristics of First-Generation Computers

• Use of Vacuum Tubes Technology

• Based on Machine Language only

• Use of Punch Cards as an Input Device

• Use of Magnetic Tapes as Memory Devices

• Use of Paper Tape as an Output Device (output was given in printouts only)

Advantages of First-Generation Computers

• The first-generation computers used vacuum tubes as basic components; the only electronic component available in that period.

• Vacuum tube technology made it possible for the advent of electronic computers.

• The use of machine language made first-generation computers relatively faster in the beginning.

Disadvantages of First-Generation Computers

• First-generation computers were large in size and therefore not portable.

• The storage capacity of computers was very low due to the use of magnetic tape.

• First-generation computers produced too much heat, which required a large cooling system.

• The functioning of input and output devices was slow.

2. Second Generation

Second-generation computers were used during 1957-1963. They are also known as transistor computers. The second generation of computers consists of two types of devices, transistors, and magnetic core. The transistors helped to develop a better computer than the first-generation computers consisting of vacuum tubes. Some second generation of computers are IBM 1920, IBM 7094, CDC 1604, CDC 3600, IBM 1401, etc.

Characteristics of the second generation of computers are:

Smaller in size: The Second generation of computers are much smaller in size than the first generation computers.

Change in circuits: The main change is the use of transistors in place of vacuum tubes(Vacuum tubes are used in the first generation of computers).

Power/ Energy Requirement: The second generation of computers requires less amount of energy (i.e. electricity) compared to the first generation of computers and produces less heat than the first-generation computer.

Language used: Assembly language is used instead of Machine Language(used in first-generation computers) for programming in computers.

Speed: Calculation of data could be done in microseconds.

Cost: The cost of Second-generation computers is reduced in comparison to first-generation computers.

Advantages of second-generation computers:

- They are smaller in size as compare to the first generation.
- It is more reliable
- Uses less power and generates less heat.
- The speed of the second generation is faster as compared to the first generation.
- Second-generation computers have improved accuracy and offer better portability.

Disadvantages of second-generation computers:

- As we know, they generate less heat but still require a cooling system.
- They require frequent maintenance.
- The commercial production of second-generation computers is difficult.
- They are used only for some specific purpose.
- They use punch cards for input.

3. Third Generation

Third-generation computers are advanced from first and second-generation computers. The third generation computer was started in 1965 and ended around 1971. Third-generation computers started using <u>integrated circuits</u> instead of transistors. The integrated circuit (IC) is a semiconductor material, that contains thousands of transistors miniaturized in it. With the help of IC, the computer becomes more reliable, and fast, requires less maintenance, is small in size, generates less heat, and is less expensive. The third-generation computer uses less electricity but still, they are a little expensive and also use an air conditioner for cooling.

The third generation computers reduce computational time. In the previous generation, the computational time was microsecond which was decreased to the nanosecond. In this generation, punch cards were replaced by mouse and keyboard. Also, multiprogramming operating systems, time-sharing, and remote processing were introduced in this generation. High-level programming language such as BASIC, PASCAL, ALGOL-68, COBOL, and FORTRAN–II was used in third-generation computers.

4. Fourth Generation

Fourth-generation computers are the four computers made. They contained microprocessors that's large – scale integrated circuits that allow more electricity than third generation.

Fourth-generation computers are cheaper, smaller and faster than the third generation computers. They store more information than the rest, second and third generation. The year of development – 1971 -1980

5. Fifth Generation

Fifth generation are work in progress. They are to contain artificial intelligence.

The year of development – 1980 – till date

The technology speed of operation – Logical Interference per Second

Storage capacity – ROM and RAM

4. CLASSIFICATION OF COMPUTERS ACCORDING TO SIZE

Objective: By the end of this class, a student should be able to define opportunity

Duration: 45mins

Week: 4

Teaching Method/Strategy: Method

Entry Behaviour (How you plan to start your Class):

The different types of computers can be grouped into six major categories according to size. Each category excels at specific functions.

Supercomputers

Mainframes

Mini-computers

Personal computers

Supercomputers

A Supercomputer is the very fastest and powerful, and expensive type of computer for processing data. Supercomputers' size and storage capacity are also huge (can occupy huge premises) and designed to process vast amounts of data in a short time with high productivity.

Uses of Supercomputers

In research and study of energy and nuclear weapons and designing aircraft, airplanes, and flight simulators.

Climate research and Weather Forecasting and Prediction of Natural Disasters.

Spaceship and Satellite Launching.

Used in scientific research laboratories.

Used in Chemical and Biological research and for highly calculation complex tasks.

Examples: IBM Roadburner, IBM Blue Gene, and CRAY-XMP-14.

2. Mainframe Computer

Mainframe computers are multi-programming high-performance computers, and multi-user, which means they can handle the workload of more than 100 users at a time on the computer.

The storage capacity of the mainframe is enormous, with a high-speed data process as well. As well as handling hundreds of input and output devices at a time.

Uses of Mainframe computers

-Performing ATM cash withdrawals and deposits. During the process, communication between the mainframe and remote computer will help accomplish the financial transactions at hand.

-Business transactions that use credit cards or prepaid cards.

-Online electronic transactions.

Cloud storage.

-Handling of patient records in major hospitals.

-Making reservations and travel schedules for airline companies.

-Manipulation and tallying of data for census and electoral purposes.

Examples: IBM Es000 series, ICL39 Series, and CDC 6600

3. Minicomputers

A minicomputer is a digital and multi-user computer system with the connection of more than one CPU. Thus, many people can work on these computers simultaneously instead of a single person. Also, it can be processed with other accessories like a printer, plotter, etc.

Minicomputers are the medium type of computers that have more functional power and are expensive than microcomputers. On the other hand, the size, storage, and speed of minicomputers are large but less than the mainframe and supercomputers.

The uses of Minicomputers

-The minicomputers are used as real-time applications in Industries, bookings, and Research Centres.

-Banks also use minicomputers for preparing payroll for employees' salaries, records, tracking of financial accounts, etc. As well as in the field of Higher Education and Engineering.

Examples: PDP 11 and IBM (8000 Series).

4. Micro Computer

Today we use many computers at home. It is also the most common microcomputer. With the invention of the microprocessors in the year 1970, it became possible to use computers for people personally at a low cost and reasonable price known as a Digital Personal Computer.

The design of microcomputers is minimal in size and storage capacity. These computers consist of many parts like Input and Output devices, Software, operating systems, networks, and Servers all of these need to connect to form a complete Personal Digital Computer.

Uses of Micro Computer –

-PC is being widely used in many fields like home, office, data collection, business, education, entertainment, publishing, etc.

-It keeps the details and prepares letters for correspondence in small businesses, creating bills, accounting, word processing, and operation of the filing systems in a large company.

Some of the major PC manufacturers are IBM, Lenovo, Apple, HCL, HP, etc.

Examples: Desktops, tablets, smartphones, and Laptops.

5. CLASSIFICATION OF COMPUTERS BY TYPES

Objective: By the end of this class, a student should be able to state the uses and applications of computer

Duration: 45mins

Week: 5

Teaching Method/Strategy: Method

Entry Behaviour (How you plan to start your Class):

INTRODUCTION

When computers are classified according to type, three different groups or classes of computers are recognized. They are digital, analogue and hybrid computers.

DIGITAL COMPUTER

This is the most common type of computer today. It is used in processing discrete data that have to do with counting. A digit is a number therefore, digital computers measure physical quantities by counting. Most applications of computers have to do with data processing. As such, the digital computer is so much in use. Many modern devices are now using digital systems. Examples of such devices are calculators, digital wristwatches, digital fuel dispensers etc.

ANALOGUE COMPUTERS

The analogue computer processes continuous data such as speed, temperature, heartbeat etc. They are mostly used in scientific measurement which may require the processing of continuous data. These are the types of specialized computers you are likely to see in hospitals connected to patients.

HYBRID COMPUTER

This type of computer combines the features of digital and analogue computers together. It can count as well as measure.

MICRO COMPUTERS

This is the smallest and most popular class of computers.

Microcomputers are also called personal computers (PC) or desktop computers. They are the most widely used and the fastest growing type of computer. They are accessible, relatively cheap and interactive. It is an example of a general-purpose computers.

CLASSES OR SIZE OF MICRO-COMPUTERS

Microcomputers came in different sizes ranging from desktop, laptop, palmtop, notebook computers etc.

DESKTOP

This category of microcomputer can be set on the top of a desk "Desktop". It supports other peripherals and has a very high storage capacity and speed.

LAPTOP COMPUTER

This type of computer can be placed on the lap and also in a belief case. They can be either AC-powered, battery-powered or both. They combine the power of the PC with mobility.

NOTEBOOK COMPUTERS

These are very high PCs but have all the capacities of a PC.

Palm top: They are small enough to be held in the palm of your hand: They are equally as powerful as the Desktop.

WORK STATIONS

These are more powerful than the PCs. They are used by engineers and scientists who process a lot of data. It is a kind of special-purpose computer.

SERVER

A computer that has been optimized to provide services to other computers over a network. Servers usually have powerful processors, lots of memory and large hard drives and cost more than typical mini computers. They are used by large organizations such as banks, universities, central banks, national population commissions etc. The mainframe is now known as an enterprise server.

CLASSIFICATION OF COMPUTER BY FUNCTIONALITY

Classification of computers according to purpose can be grouped into two, namely:

General purpose computers

Special purposes computers

SPECIAL PURPOSE COMPUTERS

These are computers designed solely to solve a restricted class of problems e.g computers for medical diagnosis, weapon guidance, traffic control, wealth study and forecast, control of airplanes and production control of refinery and guidance etc.

GENERAL PURPOSE COMPUTER

This class of computers is also called multi-purpose computers and is used for a variety of works. They have the ability to store various programs of instructions and perform a variety of operations such as graphics, database inventory and sales analysis.

Most computers are general-purpose computers and they can handle different kinds of work.

6. COMPONENTS OF A COMPUTER SYSTEM

A computer is an electronic device, operating under the control of instructions stored in its own memory, that can accept data, process the data to produce information, and store the information for future use.

The computer system is a system because it is made up of several components that work together to enable it to function properly. There are 2 main constituents of the computer system, these are:

·   The hardware

·   The Software

Hardware

These are the physical components of the computer system. They are the tangible parts that can be seen and touched. There are two major parts, namely:

 The system unit

 The peripherals

System unit: The system unit is the rectangular casing that houses (contains) several important components that control the operation of the computer system such as the motherboard, CPU (Microprocessor), RAM, Sound card, video card, CD drive, Floppy disk drive etc. It also provides an interface for the connection of the peripherals.

Peripherals: These are the devices connected to the system unit for the purpose of input, output and storage operations. Examples of peripheral devices are a keyboard, Mouse, Monitor, Printer, Scanner, DVD, CD, USB flash drive etc.

Software

Software is a term used to describe the collection (or set) of programs that can be run on a computer system. A program is a set of instructions that tells the computer what to do, when to do it and how to do it.

There are two types of software, these include:

- System software
- Application software

System software: This software controls the computer hardware and the internal operations of the computer system. Examples include Windows OS (Windows XP, Windows ME, Windows Vista, Windows 7, Windows 8, Windows 10), Linux OS (Redhat, Fedora, Ubuntu etc.), MAC OS etc.

Application software: These are software that enables the user to perform specific operations or tasks on the computer. Examples include:

Application Software (Packages)	Function(uses)
MS Word, WordPad, WordPerfect	Used for word processing
MS Excel, Lotus 1-2-3, Quattro Pro	Used for spreadsheet, calculation and analysis
Corel draw, Paint, Photoshop, PageMaker, Corel Graphics	Used for graphic works
Front page, Publisher, Dreamweaver, cold fusion	For web designing
MS Access, Oracle, Postgre sql, Fox pro, Dbase, Ingress, MySQL	For database management
MS outlook, Outlook express, MS exchange, Send mail	For email management
MS PowerPoint, Impress, Prezi, Harvard Graphics	Used for presentation of seminars and lectures
Maths, MATLAB, SPSS, Mintab	Create and edit mathematical formulae/statistical analysis

Internet explorer, Mozilla firefox, chrome, Opera mini, UC browser, Netscape Navigator, Safari, Mosaic,	Internet/Web browsing

Characteristics of a Computer

- o Speed: The computer performs its data processing operation at a very high speed. The speed of the computer is measured in Hertz (Hz). A computer with a speed rating of MegaHertz (MHz) can perform millions of cycles of operation per second.
- o Accuracy: The computer gives accurate results as long as the correct data is keyed into it.
- o Versatility: Computers can be used to perform various kinds of tasks e.g graphic design, word processing, web development etc.
- o Reliability/Durability: Computers do not get tired like humans; they can work continuously for days and weeks without any errors.
- o Memory and storage: Computers can store large amounts of data and information. The capacity of the memory/storage device is measured in bytes. A byte is a group of eight bits. A kilobyte (KB) is 1024 bytes. A megabyte (MB) is 1,000,024 bytes.
- o Programmable: The computer hardware is useless without the program that controls it. Thus, all tasks and activities performed by a computer are made possible by means of a program.

7.　MID-TERM BREAK

8. INPUT/OUTPUT DEVICES

Objective: By the end of this class, a student should be able to state and explain input and output of devices.

Duration: 45mins

Week: 6

Teaching Method/Strategy: Method

Entry Behaviour (How you plan to start your Class):

<u>Definition of an Input device</u>

The input device is any hardware component that allows a user to enter data and instructions into a computer.
Any peripheral used to provide data and control signals to a computer. Without any input devices, a computer would only be a display device and not allow users to interact with it. Before computer processing, data must be entered into the computer by an input device so that it can be translated into machine-readable form.
Some input devices include the following: Keyboard, Mouse, Joystick, Light pen, Track Ball, Scanner, Graphic Tablet, Microphone, Magnetic Ink Card Reader (MICR), Optical Character Reader (OCR), Bar Code Reader Optical Mark Reader (OMR), etc.

<u>Keyboard</u>

The keyboard is the most common and very popular input device which helps in inputting data to the computer. The keyboard looks very similar to the keyboards of electric typewriters, with some additional keys. Keyboards allow a computer user to input letters, numbers, and other symbols into a computer.

<u>Mouse</u>
The mouse is a device that controls the movement of the cursor or pointer on a display screen. The mouse is important for graphical user interfaces because users can simply point to options and objects and click a mouse button.

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<u>Touchpad</u>

A touchpad is a small, touch-sensitive pad used as a pointing device on some portable compute
moving a finger or other object along the pad, you can move the pointer on the display screen.

Touch screen

A touch screen is an electronic visual display that can detect the presence and location of a touch
the display area.

 Trackball

A trackball is a mouse lying on its back. To move the pointer, you rotate the ball with your thumb
fingers, or the palm of your hand. It does not require much space to use it.

Light Pen

A light pen is a computer input device in the form of a light-sensitive pen used in conjunction with a computer's CRT display. It allows the user to point to displayed objects or draw on the screen in a similar way to a touch screen but with greater positional accuracy.

Stylus

A stylus is a small pen-shaped instrument that is used to input commands to a computer screen, mobile device or graphics tablet.

Joystick

A joystick allows an individual to move an object in a game such as navigating a plane in a flight simulator.

A gamepad, game controller, joypad, or video game controller is a peripheral device designed to be connected to a computer or console gaming system. It has multiple buttons and may have one or two mini joysticks.

Digital Camera

A camera that stores the pictures or video it takes in electronic format instead of to film.

Webcam

A webcam is a camera connected to a computer that allows anyone connected to the Internet to view either still pictures or motion video of a user or other object.

Optical Scanner

An optical scanner is a hardware input device that allows a user to take an image or text and convert it into a digital file, allowing the computer to read or display the scanned object.

Barcode Reader

A barcode reader or scanner is a hardware device capable of reading a barcode and printing out the details of the product or logging that product into a database.

Microphone
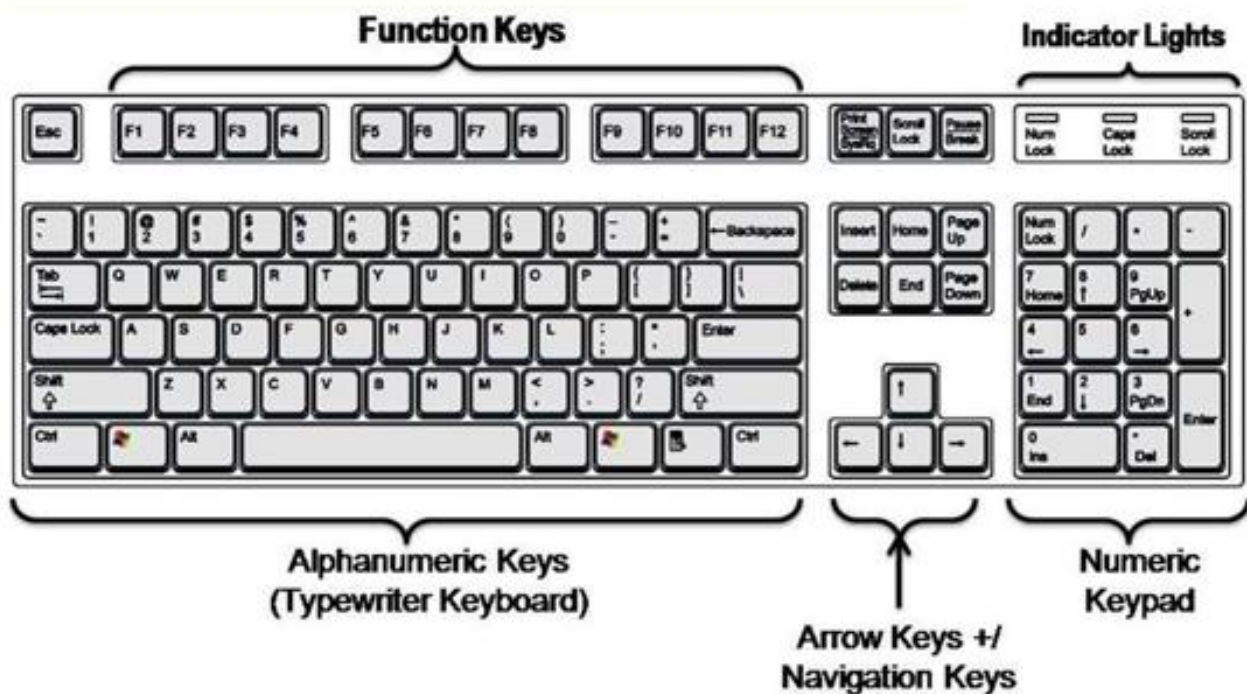
A microphone is a hardware peripheral that allows computer users to input audio into their computers.

Structure of the Keyboard
Keyboards are of two sizes 84 keys or 101/102 keys, but now keyboards with 104 keys or 108 keys are also available for Windows. A standard computer keyboard is called a QWERTY keyboard because of the layout of its typing area which is similar to that of a typewriter.
Keyboards will vary from manufacturer to manufacturer but generally have the following areas:

Function Keys: These keys are assigned a special task or function. Here is a sample of common function keys and associated tasks.
F1 Get Help or visit Microsoft Office Online
F5 Find and replace
F7 Choose the Spelling command (Review tab)
F8 Usually used with LCD projector/dual monitor devices.
F10 Show Key Tips
 F12 Choose the Save As command (Microsoft Office Button)
Function keys are also used in combination with the Shift, Alt, and Ctrl keys. (For a list of Function keys and combination commands, click the Help feature of your program. Enter shortcut keys. Click Keyboard shortcuts for Microsoft Office.)

Typewriter Keys: letters, numbers, and punctuation keys. Additional keys include the space bar, shift key (for capital letters and top symbol on keys), and Caps Lock key for a series of capital letters. Press the Enter key to begin a new paragraph in a word processor program (also the same as clicking the OK button in a dialog box) The Spacebar separates a series of letters and/or numbers into Standard English text.

Cursor Control Keys: also called arrow keys, which move your text cursor in the direction of the arrow.

Numeric Keypad: similar to a calculator for entering numbers and doing mathematical operations quickly and easily. (You may also have a calculator shortcut key on your keyboard.)

Combination Keys:

1. Shift Key: The Shift key is used to make capital letters or to access the punctuation and other symbols on the number keys and other keys. (Also used in combination with function and/or ctrl keys.)
2. The Alt key: It is used in combination with the command keys for special functions such as Ctrl+Alt+Dlt for task manager or ALT+F4 Exit Office Word 2007
3. Control key: It is used in combination with other command keys. CTRL+F10 will maximize the document window. .
4. Caps Lock: The Shift key is used for a single capital letter and the Caps Lock could be used for emphasis or to create a title. (If you press the Shift key while the Caps Lock is on, the letters will return to normal.)

Helpful Keys

1. Windows key: Shortcut for the start menu.
2. PrtScn/SysRq Print Screen: pressing print screen will capture the entire screen, while pressing the alt key in combination with print screen will capture the currently selected window.
3. Esc Escape: shortcut in dialog boxes for No, Quit, Exit, Cancel, or Abort, as well as a common shortcut key for the Stop button in many web browsers.
   Others are:
   i. Navigation keys: Arrow keys, Page Up/Page Down, Home, and End are convenient to move your cursor to the desired location.
   ii. Backspace: Erases text to the left of the cursor each time you click on the key.
   iii. Delete Erases text to the right of the cursor each time you click on the key. Or click and drag your cursor over a line(s) of text to select the text and click Delete. All the selected text will be deleted.

Types of Mouse

a)   Mechanical Mouse: Mechanical mouse contains a rubber or metal ball inside it. The movement of the cursor depends on the movement of the ball. This mouse is normally used on mouse pad. Mouse pad is a- small flat pad made of rubber or foam to provide easy movement for the mouse. It protects the mouse from dust and dirt.

b)   Optical Mouse

Optical mouse contains no ball inside it. It uses a device that emits light to detect the mouse movement. Optical sensor or laser is used in these types of mouse. It is more expensive than a mechanical mouse.

c)   Wireless Mouse

Wireless or cordless mouse is a type of mouse that does not require a wire to work. It transmits data using wireless technology like radio waves or infrared light waves. The receiver is connected to the computer through a serial or USB port.

Parts of a Computer Mouse

The parts of a computer mouse can vary by the type of computer mouse. Below is a general overview of the parts found on most computer mice.

1.   Buttons
2.   Ball, Laser, or LED
3.   Mouse wheel
4.   Circuit board
5.   Cable or wireless receiver

Functions of the mouse

The primary function of the mouse is to move the mouse cursor on the screen. Others include;

1.   To open or execute a program - Once you've moved the cursor to an icon, folder, or other clicking or double clicking that object opens the document or executes the program.
2.   To select - A mouse also allows you to select text or a file or highlight and select multiple files at once.
3.   To drag-and-drop - Once something is selected it can also be moved using the drag-and-drop method.
4.   To hover - Moving the mouse cursor over objects with additional hover information can help discover the function of each object on the screen. For example, hover the mouse over the hover link to see an example.
5.   To scroll - When working with a long document or viewing a long web page you may need to scroll up or down which can be done using the mouse wheel or clicking and dragging the scroll bar.

Differences between Mouse and Keyboard

Keyboard	Mouse
Used to enter instructions	Used to point and select
Keys are pressed	Buttons are clicked
Combination of keys can be pressed	Left or right button is clicked
Cannot drag and drop text	Drags and drops text
It has keys	It has buttons
Requires no mouse pad	Requires a mouse pad

Definition of Output devices

Output devices are devices that enable the computer to communicate the results of data processing carried out by it to the user. These devices enable the computer to display text, graphics (pictures and images) and produce sound. Examples of computer output devices include monitor, printer, speaker, plotter, braille embosser etc.

Features and uses of output devices

1. Monitor: The monitor, also called Visual Display Unit (VDU) is a TV-like structure attached to the System Unit through the VGA cable. It displays text and graphics (pictures and images). The content showing on the monitor is called a soft copy.

2. Printer: A printer is a device attached to the System Unit through the USB cable or other types of cable. It is used to produce the information (text, graphics, images, illustrations) showing on the monitor on paper, transparencies, and plastic. Such a printout is called a hardcopy.

3. Speaker: A speaker is a device used for producing sound captured by the microphone or music in mp3, wav, etc. formats. Speakers come in different forms such as headphones, earphones, canalphones, headset etc. and can also be used with portable devices such as mp3 player, mobile phones etc.

4. Plotter: A special type of printer used for printing drawings, charts, maps etc. using multi-coloured automated pens. It is usually used by architects, engineers and surveyors. They are rarely used now and are being replaced by wide-format conventional printers, which can produce high-quality graphics.

5. Projector: A device that helps direct the content on a display screen (monitor) onto a particular flat surface.

Structure and type of CRT monitor

The Cathode Ray Tube (CRT) used as a computer monitor was invented by Karl Ferdinand Braun. This monitor employs the CRT technology used most commonly in the manufacturing of television screens. In this, a stream of intense high-energy electrons is used to form images on a fluorescent screen. A cathode ray tube is basically a vacuum tube containing an electron gun at one end and a fluorescent screen at another end. From this electron gun, a process called thermionic emission generates a strong beam of electrons. These electrons travel through a narrow path within the tube at

high speed using various electromagnetic devices and finally strike the phosphor points present on the fluorescent screen, thus creating an image.

Today, CRT monitors are being replaced with flat Plasma screen, Liquid Crystal Display (LCD), etc.

Types of monitors

There are two types of monitors, namely:

1. Monochrome monitor: This monitor displays its characters in only one colour. The colour could be white, green or amber. Looking at the monochrome monitor, one can see two colour; one colour for the background and one for the foreground. The two colour combinations can therefore be black and white, green and black or amber and black.

2. Colour monitor: This monitor displays information in colour. It is similar to a colour television but it handles data more quickly and has a sharper output.

Types of printers

There are two types of printers, namely impact and non-impact printers.

I. Impact Printers: This type of printer behaves like a typewriter whereby a character is printed when a metal slug strikes a carbon ribbon. Impact printers have contact with the surface of the paper. Examples of impact printers include the following:

A. DOT MATRIX printer: This prints characters and graphic images by impacting a ribbon and transferring dots of ink onto the paper. It prints dot matrix characters by pressing the end of selected wires against ribbon and paper. The dots are used to form the characters and images on the paper.

B. LINE printer: This prints a line of characters at a time. The output speed is between 200 to 3000 lines per minute (LPM)

C. CHARACTER printer: This prints one character at a time moving across the paper. The output speed ranges from 200 to 400 characters per second (cps)

II. NON-IMPACT PRINTER

Non-impact printer creates images on paper in a manner similar to that of a photocopying machine. They do not have contact with the surface of the paper. Examples include:

A. INKJET printer: This prints by spraying small streams of quick-drying ink onto the paper and using it to form characters, shapes and images. The ink is stored in disposable ink cartridges, which can be black or coloured. They are found in homes and offices.

B. LASER printer: This uses an electrically charged drum to transfer toner or dry ink onto paper like the photocopier does. It traces an image by using a computer-controlled laser beam.

C. THERMAL printer: This prints by transferring dots of ink or dye from a ribbon onto paper and passing the ribbon and the paper across a line of heating elements. The characters are produced with a print head containing a matrix of small heating elements. This printer is very quiet in operation because the printer head does not strike the paper.

DIFFERENCES BETWEEN IMPACT AND NON-IMPACT PRINTER

S/N	IMPACT PRINTER	NON-IMPACT PRINTER
1	Makes noise while printing	Does not make noise while printing
2	Produces low quality images	Produces high quality images
3	Uses ribbon to print	Uses ink (dry and wet) to print
4	Does not have heating element	Has heating element that dries the ink on paper
5	Prints only one colour at a time	Can print more than one colour at a time
6	Has striking pins/heads that strike the characters or dots on paper	Does not have striking pin heads to strike characters on paper

9. SYSTEM UNIT AND STORAGE DEVICES

System Unit: The system unit is the part of the computer that houses electronic components of the computer used to process data.

Storage devices: They are computer hardware components that are used for storing data in electronic form. It can store text, images, video, audio, symbol, etc.

Classification of storage devices

    a. Internal storage device
    b. External storage device

- Internal storage devices are seen inside the computer. An example of internal storage device is hard disk.

- External storage devices are seen outside the computer. Examples include flashdrive, memory card, compact disks, external hard drive.

Other sub-categories of storage devices

- Magnetic storage devices

Today, magnetic storage is one of the most common types of storage used with computers. This technology is found mostly on extremely large HDDs or hybrid hard drives.

Floppy diskette

Hard drive

Magnetic strip

SuperDisk

Tape cassette

Zip diskette

- Optical storage devices

Another common type of storage is optical storage, which uses lasers and lights as its method of reading and writing data.

Blu-ray disc

CD-ROM disc

CD-R and CD-RW disc.

DVD-R, DVD+R, DVD-RW, and DVD+RW disc.

- Solid-state storage devices

Solid-state storage (flash memory) has replaced most magnetic and optical media as it becomes cheaper because it's the more efficient and reliable solution.

USB flash drive, jump drive, or thumb drive.

CF (CompactFlash)

M.2

Memory card

MMC

NVMe

SDHC Card

SmartMedia Card

Sony Memory Stick

SD card

SSD

xD-Picture Card

- Online and cloud

Storing data online and in cloud storage is becoming popular as people need to access their data from more than one device.

Cloud storage

Network media

Paper storage

Early computers had no method of using any of the technologies above for storing information and had to rely on paper. Today, these forms of storage are rarely used or found. In the picture is an example of a woman entering data to a punch card using a punch card machine.

OMR

Punch card

Uses of storage devices

1. Used in sharing files
2. They used to keep data temporarily or permanently
3. They are used to backup saved files
4. They are used in transporting files from one storage device to another

10. DATA AND INFORMATION

Objective:

Duration: 45mins

Week: 7

Teaching Method/Strategy: Method

Entry Behaviour (How you plan to start your Class):

Definition of Data

Data are raw facts. They are figures, words and symbols that have not been processed or put into meaningful form. Data can be referred to as raw material from which information is produced.

Types of Data

1.   Quantitative Data

2.   Qualitative Data

Quantitative Data

 Quantitative data are data that can be counted or measured, and given a numerical value

Examples of quantitative data:

Scores of tests and exams e.g. 74.5, 67, 98, etc.

The weight of a person.

The temperature in a room.

There are two general types of quantitative data:

a.   Discrete data: Data that can be counted and has finite values is known as discrete data. Examples: 1, 2, 50, 89

b.   Continuous data: Continuous data are data which can take any values, Continuous data has finite values. Examples: 1.33, 0.222, 45.11111

Qualitative Data

Qualitative data can't be expressed as a number, so it can't be measured. It mainly consists of words, pictures, and symbols, but not numbers. It is also known as Categorical Data as the information can be sorted by category, not by number.

Examples of qualitative data:

Colors e.g. the color of the sea

Popular holiday destinations such as Switzerland, New Zealand, South Africa, etc.

Ethnicity such as American Indian, Asian, etc.

In general, there are 2 types of qualitative data:

Nominal data

Ordinal data.

a.   Nominal Data: This data type is used just for labeling variables, without having any quantitative value. The term 'nominal' comes from the Latin word "nomen" which means 'name'

Examples of Nominal Data:

Gender (Women, Men)

Hair color (Blonde, Brown, Brunette, Red, etc.)

Marital status (Married, Single, Widowed)

b.   Ordinal Data: "Ordinal" means "order". This type of qualitative data places variables in rank or order.Examples of Ordinal Data: First, second, and third, etc, low, medium, and high.

Sources of data

Data could be gathered or collected from various sources. Some of the sources include the following:

i.   Federal Office of Statistics

ii.   National Population Commission

iii. Independent Electoral Commission

iv. Examination Bodies

v.   School Attendance Register

vi. Bank Statement

Definition of Information

Information is processed data.

Sources of information

Information could be gathered from different sources. Some of the sources of information include the following:

i.   Radio

ii.   Television

iii. Newspaper

iv. Computer

Qualities of good information

1.   Relevance: It must be suitable for the purpose it is required for.

2.   Accurate: It be free from errors

3.   Availability: It should be easy to obtain or access

4.   Timely: It should be available at the right time

5.   Comprehensive/Completeness: It should contain all necessary details

6.   Reliability: It should come from a reliable source.

Processing of Data into Information

The processing of data into information consists of a combination of activities and procedures. Some of the ways in which raw data can be converted into information are:

i.   Collecting: Data to be processed need to be gathered from various sources

ii. Classifying: This is the process of identifying certain characteristics in an items of data and putting them into categories or groups according to those characteristics

iii. Sorting: Sorting takes the form of arranging data into a predefined order of sequence.

iv. Editing: This takes the form of correcting mistakes from the body of data.

v. Calculating: This is by performing arithmetic manipulation such as adding, subtracting, dividing and multiplication

vi.Translating: This is the process of changing language data into another language data.

Difference between Data and Information

Data

Information

1. Raw facts

1. Processed data

2. Unorganised array of elements

2. Arranged element

3. Unanalyzed sets of element

3. Analysed element

4. It makes no meaning

4. It is meaningful