INTRODUCTION TO COMPUTER BASIC SKILLS

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Categorizing Computers We classify computers by:

- Classification by generation/age of technology.
- Size and processing power
- Usage or use
- purpose
- Functionality

Classification according to size and processing power.

- We have four main groups namely:
  - Supercomputers
  - Mainframe computers
  - Minicomputers
  - Microcomputers

Supercomputers

- Fastest, largest, most expensive and powerful computers available
- Performs many complex calculations in a fraction of a second
- Used in scientific research which requires enormous calculations eg aerodynamic design and simulation, defense and weapon analysis etc

Mainframe computers

- Less powerful and less expensive than supercomputers.
- Large, expensive, powerful, many users
- Reliability, data security, central control important
- Mostly found in government agencies, banks, airports etc

Minicomputers

- Resembles the mainframe but is slightly smaller. Hence referred to as small-scale mainframe.
- Used mainly in scientific laboratories, research institutions.

Microcomputer

- Smallest, cheapest and relatively least powerful. Its called microcomputer because its CPU is called a microprocessor.
- It is also referred to as Personal computer (PC)
- Designed to be used by one person.
- Maily used in learning institutions, small business enterprise, communication centres etc.

Microcomputer Contd

- Types of Microcomputers present today:
  - Desktop;- Designed for the top of the office desk.
  - Laptop'- Portable like a briefcase. Placed on the lap. Their capacity and speed is the same as that of a desktop. They are a bit expensive than desktops.
  - Palmtop;- e.g. personal digital assistant (PDA) small enough to fit in the pocket and held in the palm. Main task is to maintain a diary and keep contact lists but can be used for word processing or spread sheets. Have less storage capacity and slower than a desktop.

2.Classification according to purpose

- General purpose computers'- designed to be able to perform variety of tasks when loaded with appropriate programs.
- Special purpose computers'- designed to serve specific purpose or accomplish particular tasks e.g Robots used in manufacturing industries, mobile phones etc. Are very fast and efficient

3. Classification according to functionality/type of data accepted

- Classified according to the type of data they can process. Data can be either discrete (digital) or continuous (analog).
- We have two types:-
  - Digital computers
  - Analog computers
  - Hybrid computers (process both analog and digital data.

- Digital
- They process data that is represented in the form of discrete numbers or digits such as 0 and 1. Their arithmetic operations and logical comparisons are based on digits and on other characters that have been numerically coded.

Analogue Computers

- They are computers that deal with variable/continuous data/quantities such as temperature, pressure, humidity etc. The output from them is often in form of graphs or smooth curves from which the information can be read. They perform arithmetic operations and logical comparisons by measuring changes in physical magnitudes such as electronic voltage, pressure changes

Hybrid

- Hybrid These are the computers that have the combined features of digital and analogue computers. Both the digital and the analogue features are built within the same processor.

4. classification by use

- A) personal computer (PC) - a microcomputer designed for independent use by an individual at work or in the home. Some PC's are portable.
- b) A Home Computer - A low cost microcomputer of limited capabilities designed for domestic use with programs such as playing games on controlling family finances.

classification by use

- c) Embedded Computers - These computers are within some other devices/systems but are not accessed directly e.g. Small computers found in digital watches, video recorder, washing machines etc

5.Classification by generation/age of technology.

- History of computers
- ***Dates back to somewhere around 3000 B.C.***
  Abacus was developed in the Orient.
  Use:- Arithmetic calculations.
- ***Blaise Pascal***
  --First mechanical adding machine in 1642

First generation computers

- First Generation computers (1940-1958)- large in size and used VACUUM TUBES/THERMIONIC VALVE e.g. ENIAC
- The input devices were paper tapes or punched cards. Electronic typewriters, programmed to type by a paper tape or punched card reader were used for printing reports. They had between 1K and 4K of RAM.

1st generation

- The computers received its instructions in machine language or electrical on/off signals. There were no programming languages. The application software available was tabulating, now called spreadsheets. Since computers could only perform one task a time, the computer work was done in batches thus the operating system was called batch processing systems in 1950's

Second generation computers

- 2nd Generation computers (1958-1964)- used transistors and were a bit small, cooler and reliable. E.g IBM1401, honeywell 200
- Processing speed has improved by a factor of five. They utilized keyboards and video display monitors. The first light pen was used as an input device for drawing on the face of the monitor. High-speed printer came into use.

2nd generation

- RAM grew from 4K to 32K, making it possible for the computer to hold more data and instructions. Use of magnetic tapes and disks was introduced to replace permanent storage on computer cards
- This generation marked the common use of high-level languages. FORTRAN (1957) was used for scientific purposes and COBOL (1961) for business purposes.

2nd generation

- There were also improvements in system software. Almost every computer had its unique operating system, programming language and application software.

Third generation computers

- 3rd generation (1964-1970)- used intergrated circuits-IC. E.g IBM360
- used integrated circuits- (a number of electrical components on a single slice of silicon) termed as hybrid integrated technology where separate transistors and diodes were inserted into circuits.

3rd generation

- Integrated Circuits technology combines several physical electronic components within a small crystal called silicon chip
- The Ics are much smaller compared to the physical electronic components hence resulting to physical smaller computers than 2nd generations

3rd generation

- There were several improvements such as:-
- Increased processing speeds
- Increased accuracy.
- Integration of hardware and software.
- The ability to perform several operations simultaneously
- Data communication advances.

3rd generation

- Many high level programming languages were developed among them BASIC and Pascal. IBM created os/360 operating system. Software growth enhanced due to unbundling, or selling the software separate from the hardware

Fourth generation of computers

- 4th generation (1970 upwards)- this used large scale intergrated(LSI) and Very large scale intergrated (VLSI) circuits. This were used in development of microprocessors e.g IBM370
- Large-scale integration, a technique for packing more and more circuitry in a single chip was developed.
- "4th generation brought major advances in 2nd generation mainframes, in 3rd generation minicomputers

4th generation

- 4th generation added a brand new category of machine; the microcomputer or personal computer. There was dramatic increase in processor speed. The keyboard and the video monitor have become standard 1/0 devices. The mouse began playing a major role

Fifth generation computers

- 5th generation computers. This falls in todays computers that have very high processing power and speed.
- Super chip development is truly at the Center of the fifth generation. (A chip is a thin piece of silicon on which electronic components are etched). Much advancement is still going on e.g. use of object-oriented languages, artificial intelligence.

5th generation

- The use of parallel processing and superconductors is helping to make artificial intelligence a reality. The goal of fifth-generation computing is to develop devices that respond to natural language input and are capable of learning and self-organization

Review questions-1

- What is a computer?
- List functions of a computer
- State different parts that make up a computer.
- Differentiate between supercomputers and main frame
- Give reasons why smaller computers like laptops tend to be more expensive than desktop.
- Define the term ports