Computer Awareness
Module - 1

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What is a computer ?

A computer is a machine that can store, retrieve, and process data. It can also perform logical and arithmetic operations. Computers are used for many tasks, such as sending emails, browsing the internet, and playing games.

How do computers work?

- Computers are programmed to perform specific tasks.
- They use a binary system, which uses 0 and 1 to store data, calculate algorithms, and display information.

Computers receive data as input and produce information as output.

Advantages of Using Computers

Speed	data, instructions, and information flow along electronic circuits in a computer at incredibly fast speeds.
Reliability	dependable and reliable because they rarely break or fail.
Consistency	produce the same results — consistently, generate error-free results
Storage	store enormous amounts of data and make this data available for processing anytime it is needed.
Communications	computers can communicate with other computers, often wirelessly, and allow users to communicate with one another.

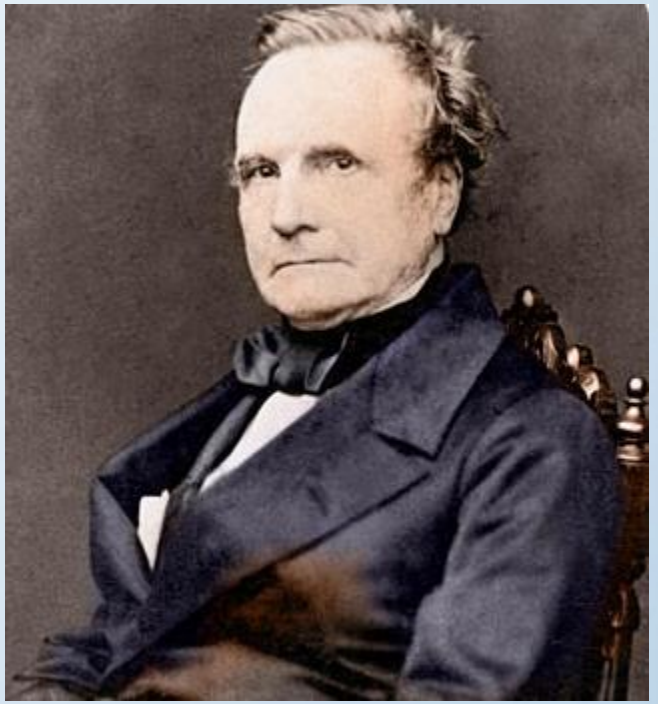
Calculator

AND, OR, NOT

Conditional Checking

Father of computer :

Charles Babbage is known as the father of the computer because he was the first to invent the Analytical Engine, which led to the invention of the modern-day computer. The Analytical Engine consisted of an Arithmetic Logic Unit or ALU, an integrated memory, and a basic flow control involving branching and loops.



1. Differential Engine – 1824
2. Analytical Engine – 1840

Alan Turing considered the father of modern computer science, Alan Turing was famous for his work developing the first modern computers, decoding the encryption of German Enigma machines during the second world war, and detailing a procedure known as the Turing Test.

HISTORY OF COMPUTERS

ABACUS

Earliest Calculation Device

Abacus with 10 beads strung into the wires attached to a frame, which was used to perform simple calculations.

1642: PASCAL

Blaise Pascal

The first basic calculator which would do only limited jobs.

1690

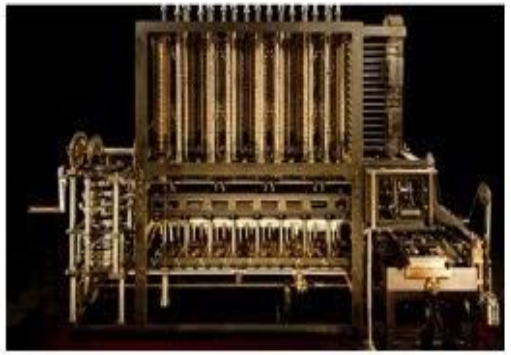
Leibnitz

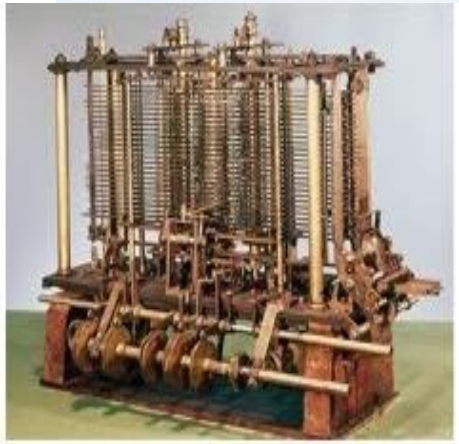
Calculating machine that could perform addition, subtraction, multiplication, division and calculate square roots. However, the instructions were hardcoded into the machine and could not be changed

1822: Difference Engine

Charles Babbage

His invention could perform calculations without human intervention



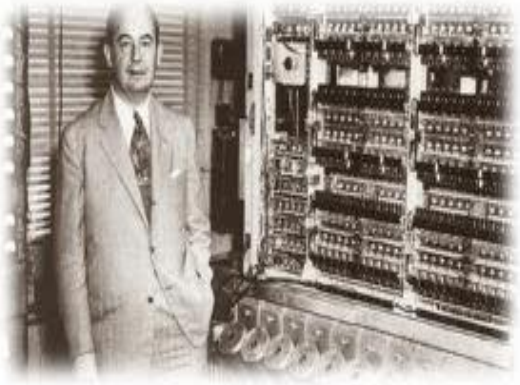


1840

1823: Analytical Engine

Charles Babbage

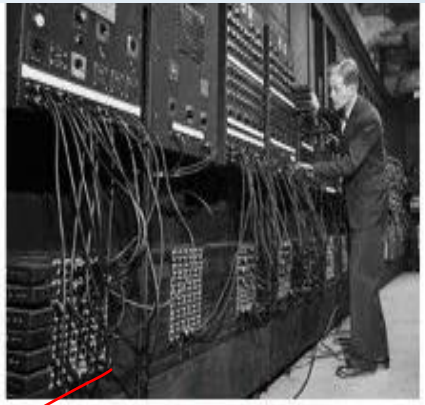
Technology of the analytic engine provided base to the technology of modern computers. The analytic engine had an arithmetic unit to perform calculations and mechanism to store results and instructions. Babbage is known as the father of the modern day computers.



1940

Jon Von Neumann

To encode instructions in the language. He was the force behind the development of the first stored-program computer.



1946 ENIAC

J. Presper Eckert and John W. Mauchly

Invented giant ENIAC machine at the University of Pennsylvania. ENIAC (Electrical Numerical Integrator and Calculator) was the first machine to use large number of vacuum tubes. The machinery required a big space and lot of energy to keep it cool. Further, it had punched-card input and output. The instructions had to be fed into the machine by way of switches because there was no internal memory within the machine.

Same speed

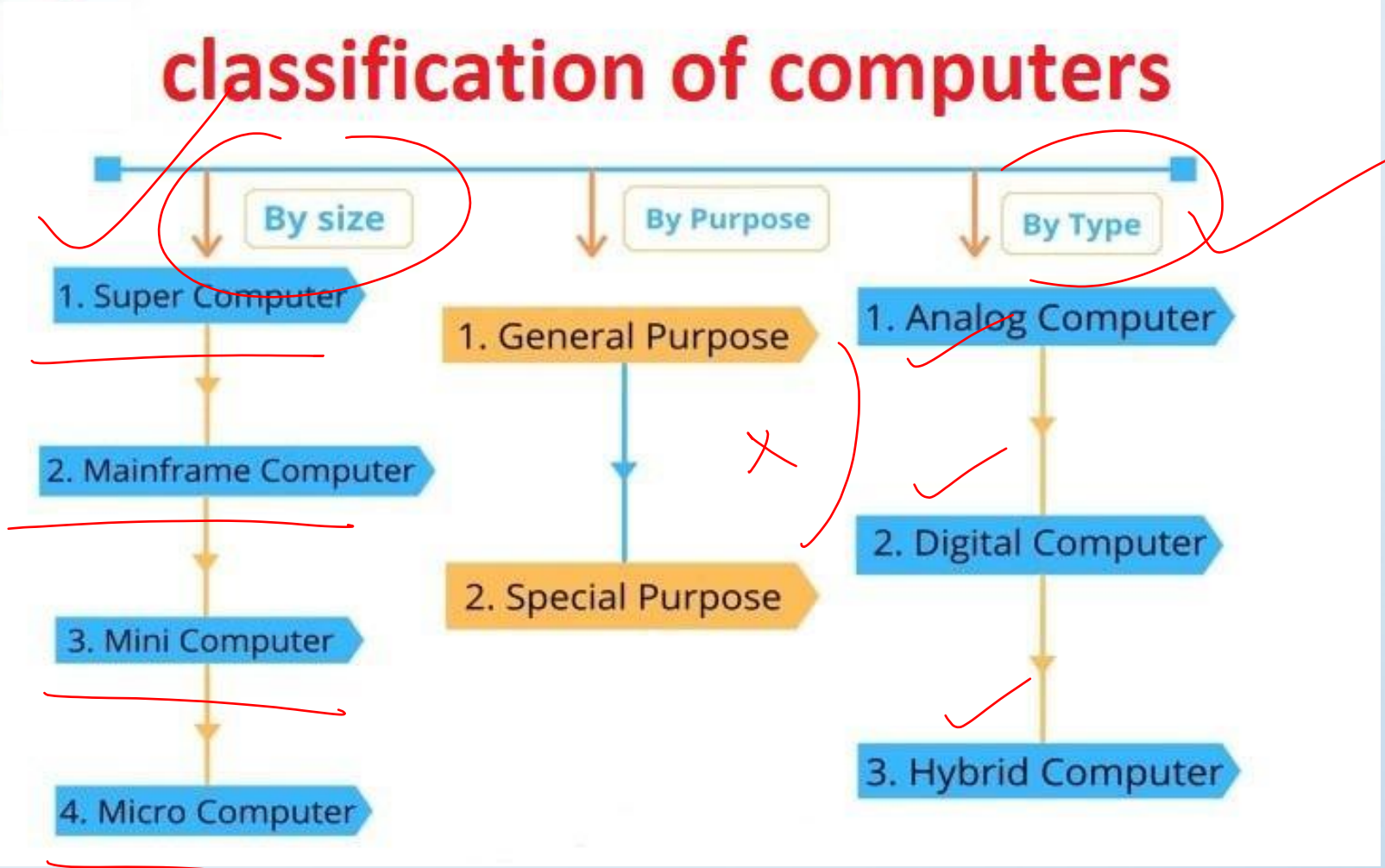
- **Diligence:** A computer's diligence allows it to perform tasks continuously without slowing down or getting tired. This means that a computer can perform millions of calculations or tasks with the same accuracy and consistency.

- **Versatility :** A computer's versatility allows it to perform more than one task at the same time. This means that a computer can perform different types of work completely.

multitasking

Disadvantages of using a computer:

classification of computers



Analog computer

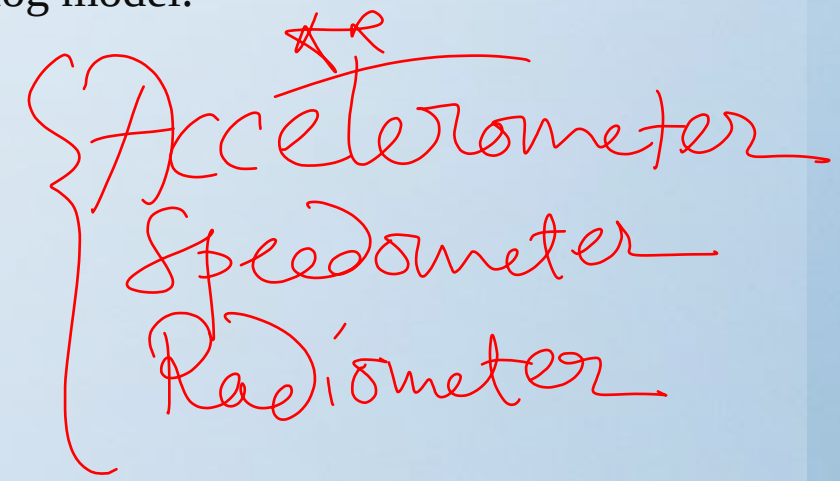
An analog computer is a device that uses physical quantities to solve problems. It uses continuous quantities like electrical potential, mechanical motion, or pressure to model a problem.

How it works

- The analog computer is set up to match the initial conditions of the problem.
- The computer is allowed to change freely.
- The answer to the problem is found by measuring the variables in the analog model.

Advantages

- Analog computers can quickly solve large-scale simulations.
- They can provide almost instantaneous results.
- They can be faster than digital computers for specific operations.



Digital computer

A digital computer is a machine that processes data and instructions using binary code (0s and 1s). Digital computers are used to perform calculations, store data, and control machines.

How it works

- **Input :** Information is entered into the computer through a keyboard, mouse, or other device
- **Storage :** The computer stores instructions and data in memory
- **Processing :** The computer uses a calculation unit to manipulate data and perform calculations
- **Control :** The control unit calls up data and programs from storage and passes the results to the output unit
- **Output :** The computer presents the results through a display, printer, or other device

Hybrid computer

A hybrid computer is a computer that combines features of both analog and digital computers. It can process both continuous and discrete data.

What it's used for

- Hybrid computers combine the accuracy of analog computers with the speed of digital computers.
- They allow for complex computations with the precision of digital systems.
- They also allow for the management of real-world, continuous variables like analog computers.
- Hybrid computers are used in scientific laboratories, defense systems, airlines, ships, factories, medical machines, and cell phones.
- They are used to measure a patient's heartbeat.

Super computer

A supercomputer is a high-performance computer that can solve complex problems quickly. They are used in science and engineering to perform large-scale calculations.

What they are used for

- **Weather forecasting**: Supercomputers can predict the impact of extreme storms and floods.
- **Oil and gas exploration**: Supercomputers can collect large amounts of seismic data to help find oil reserves.
- **Drug discovery**: Supercomputers can test mathematical models to discover new chemical compounds for pharmaceuticals.
- **Cryptology**: Supercomputers can rapidly process large amounts of internet data to identify cybersecurity threats.
- **Climate change**: Supercomputers can test simulations to help predict climate changes.

Mainframe computer

A mainframe computer is a large, high-performance computer that can process large amounts of data at high speeds. Mainframes are used for critical applications that require high security, reliability, and speed.

What they do:

Process large amounts of data in real time, Run financial models, Automate tasks, Perform large-scale transaction processing, and Run applications like censuses and industry statistics.

IBM zEnterprise
Hp zWorkStation

History:

- The first mainframe computers were developed in the 1930s
- The ENIAC was a famous mainframe computer created during World War II
- The programming language COBOL is closely associated with mainframes

Mini computer / Desktop

A mini computer is a small-scale computer that is smaller and less powerful than a mainframe or supercomputer but more powerful than a personal computer. They are also known as midrange computers.

History

- Minicomputers were developed in the mid-1960s.
- They were sold at a much lower price than mainframe and mid-size computers from IBM and its direct competitors.
- Microcomputers emerged from minicomputers

Micro computer

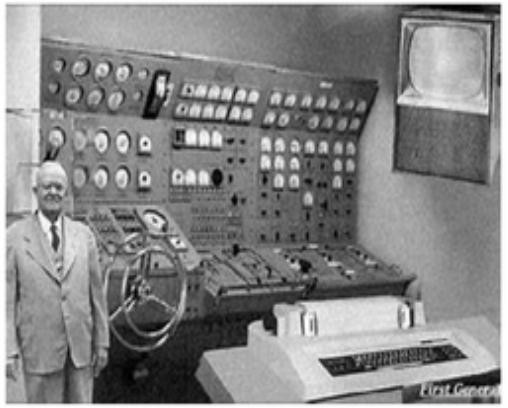
A microcomputer is a complete computer on a small scale, designed for use by one person at a time. An antiquated term, a microcomputer is now primarily called a personal computer (PC). Common microcomputers today include laptops and desktops. In modern usage, microcomputers are complete computer systems that are smaller than a normal PC, such as single-board computers (SBCs).

Laptop, Palmtop, Tablet

GENERATIONS OF COMPUTER

1st Generation Computer:

- Period- 1940-1956
- Circuitry- Vaccum tube
- Memory capacity- 20kB
- Processing Speed- 300 IPS inst.per sec.
- Programming Language- Assembly Language
- Example of Computers- UNIVAC,EDVAC



2nd Generation Computer:

- Period- 1956-1963
- Circuitry- Transistor
- Memory capacity- 128kB
- Processing Speed- 300 IPS
- Programming Language- High Level Language
- Example of Computers- IBM 1401,CDC 3600

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3rd Generation Computer:

- Period- 1964-1971
- Circuitry- Integrated chips(IC)
- Memory capacity- 1MB
- Processing Speed- 1 MIPS
- Programming Language- C ,C++
- Example of Computers- IBM 360 series,
- 1900 series

4th Generation Computer:

- Period- 1971-present
- Circuitry- Microprocessor(VLSI)
- Memory capacity- semiconductor, high
- Processing Speed- Faster than 3rd gen.
- Programming Language- C , C++ , Java
- Example of Computers- Pontium Series, Multimedia,Stimulation.

5th Generation Computer:

- Period- present & beyond
- Circuitry- Ultra Large Scale integration
- Memory capacity- ULSI & VLSI
- Processing Speed- Very Fast.
- Programming Language- All languages
- Example of Computers- Artificial Intelligence, Robotics.

Fifth generation computers are in designing mode with Artificial Intelligence technology.

The first computer made available for commercial use was: (SSC CGL)

(a) MANIAC
(b) ENIAC
(c) UNIVAC
(d) EDSAC

Which computer was the first to use the magnetic drum for memory ? (SSC CGL)

(a) IBM - 650
(b) IBM - 7090
(c) IBM - 701
(d) IBM - 360

Integrated Circuit (IC) chips used in computers are made with ____.
(BANK)
(a) Silicon
(b) Copper
(c) Aluminium
(d) Gold

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Thank You

See you next day