Computer Basics

Definition:

- Computer is an electronic machine that stores, retrieves and process data.
- Computer.. Latin word.. Compute
- Calculation Machine
- A computer system includes a computer, peripheral devices, and software.
- It can't think , it can only carry out instructions given to it.
- A set of instructions that directs its actions is called program.

Computer Basics

The instructions generally direct the computer to perform three basic functions. These are:

1. Accepts input.
2. Processes data
3. Produces output

- ***Input*** refers to whatever is sent to a Computer system
- ***Processing*** is the way that a computer manipulates data

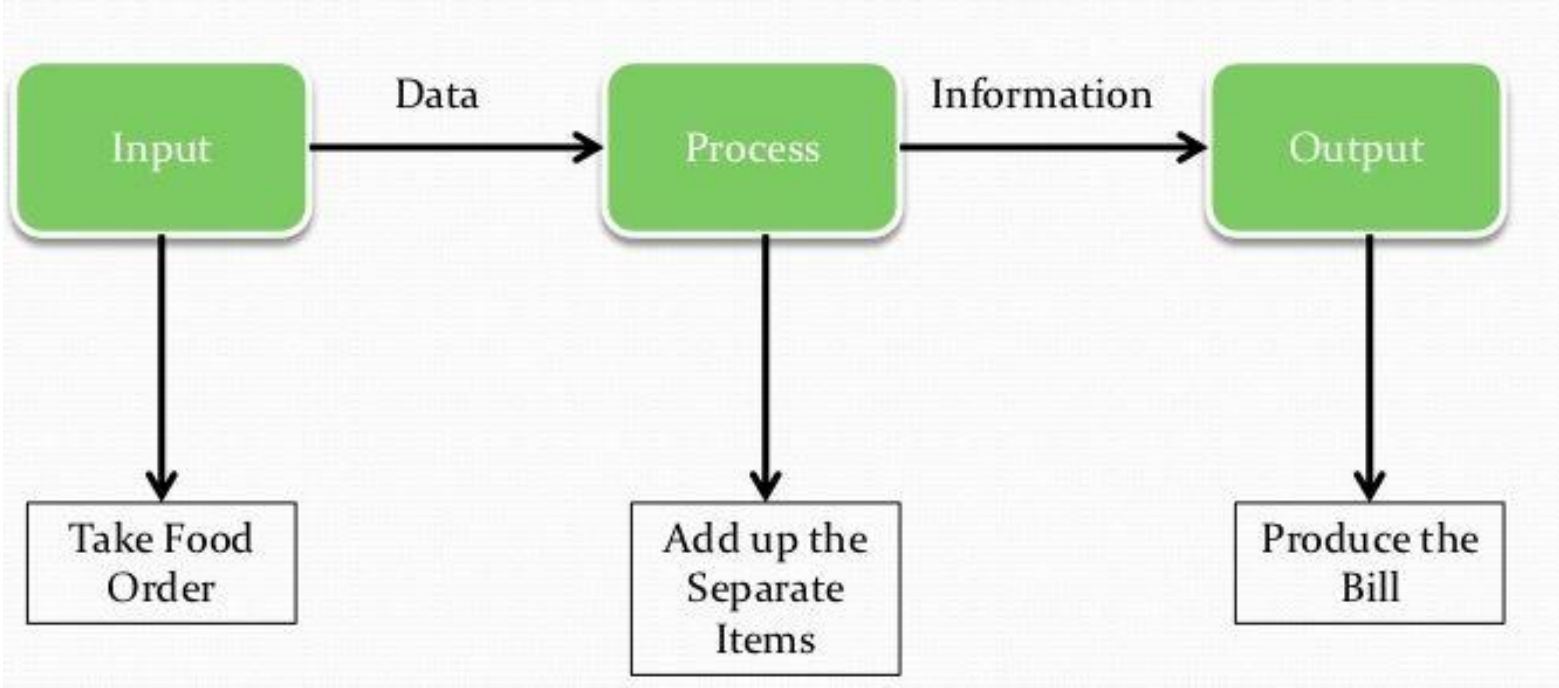
❑ The control and storing of data, numerical comparisons and arithmetic operations are performed on the input data to produce the results.

❑ A computer processes data in a device called the ***central processing unit*** (CPU)

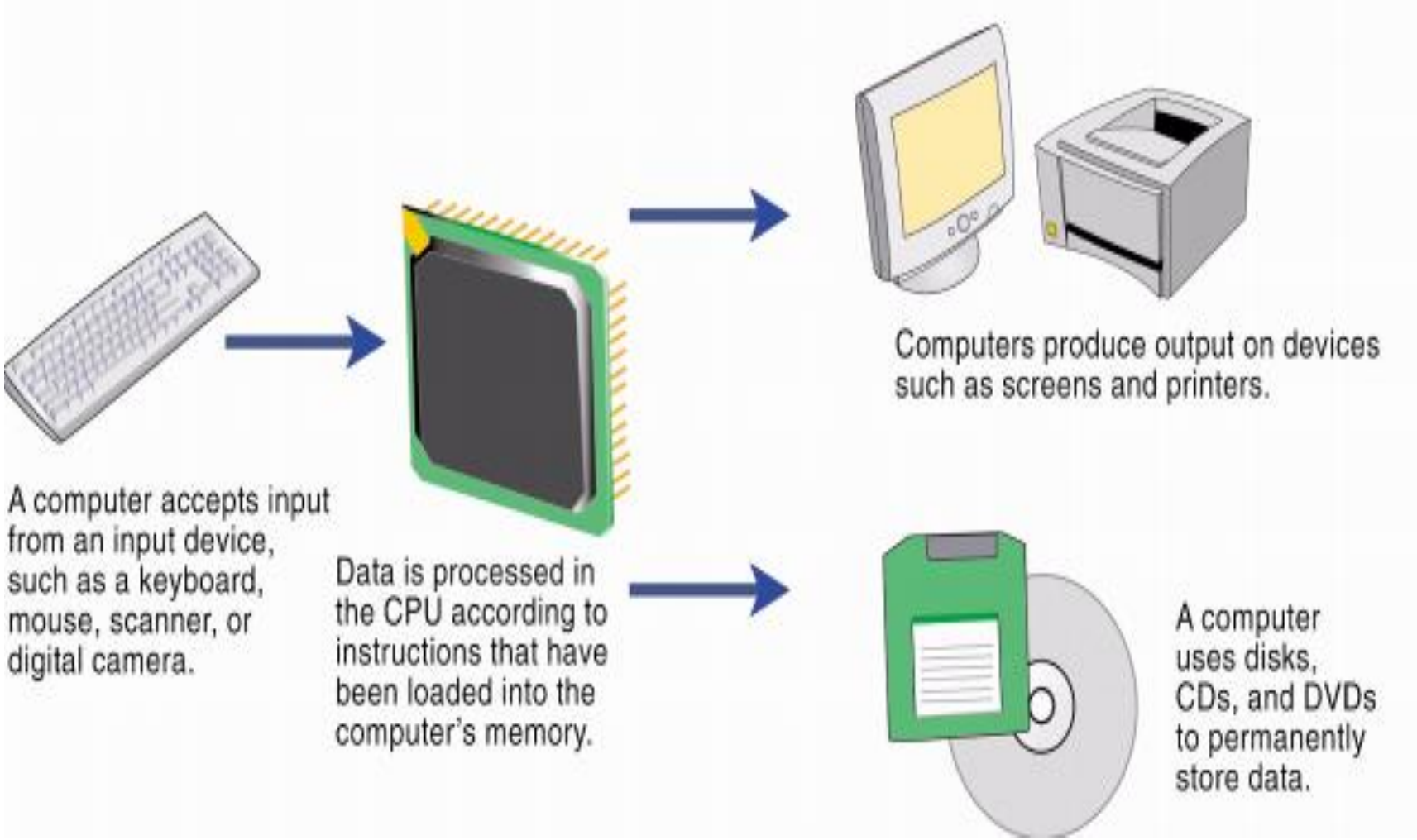
Computer Basics

- O***utput*** is the result produced by the computer

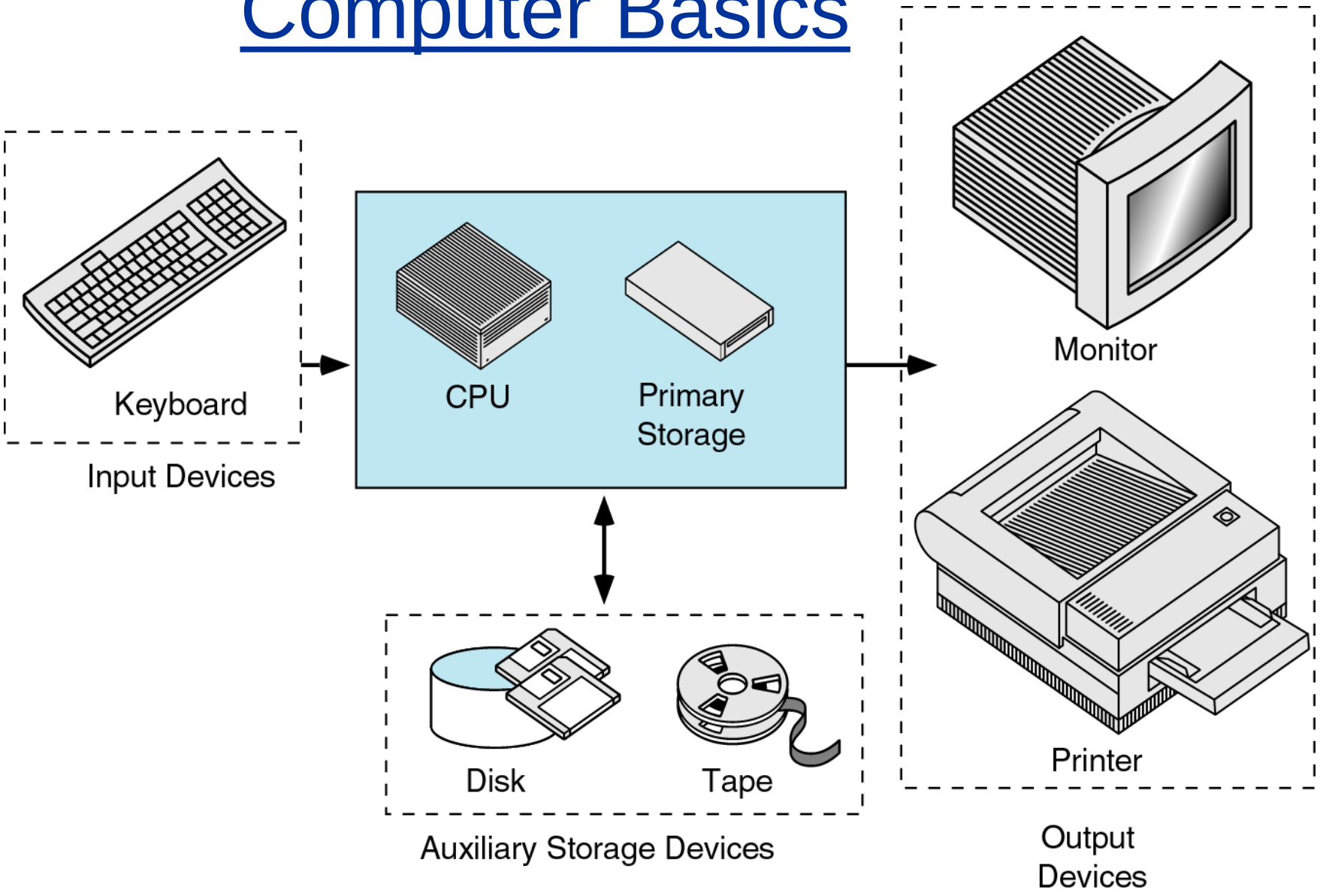
❑ An output device displays, prints or transmits the results of processing



Computer Basics



Computer Basics



Components of a Computer System

Computer is used to process data and a data processing system consists of more than just a machine.

A computer system contains :

- Hardware
- Software
- Humanware
- Operational procedures

Components of a Computer System

Hardware

- Physical devices of computer system
- The hardware are the parts of computer itself including the Central Processing Unit (CPU) and related microchips and micro-circuitry, keyboards, monitors, and drives (floppy, hard, CD, DVD, optical, tape, etc...).
- Other extra parts called peripheral components or devices include mouse, printers, modems, scanners, digital cameras and cards (sound, colour, video) etc...
- Together they are often referred to as a personal computers or PCs.

Components of a Computer System

Software

- Basically a software is a program.
- Simply software, is a collection of data or computer instructions that tell the computer how to work.
- A program is a sequence of instructions, which directs a computer to perform certain functions.
- **Examples Software-** Internet browser, Firefox, Google chrome, Operating systems- android, iOS, Linux, macOS, windows. Photo graphics program- Adobe photo shop.
- **S/W generally categorized as :**

I. System Software

II. Application Software

Components of a Computer System

1. **Systems software**

- System software consists of programs that help the use of a computer.
- includes the programs that are dedicated to managing the computer itself, such as the operating **system**, file management utilities, and disk operating **system** (or DOS).

- **System software** coordinates the activities and **functions** of hardware and **software**, and it controls the operations of computer hardware.
- Example : Open Source s/w and Paid s/w.

Components of a Computer System

2. Application Software

- Application software includes programs to perform user applications.
- A **software** which is developed to help the user to perform specific tasks is called **application software**.
- An **application** is any program, or group of programs, that is designed for the end user.
- Example : Word processing ,Spreadsheet Software, Desktop Publishing Software, Database Software, Communication Software, Presentation Software, Internet Browsers, Email Programs.

Components of a Computer System

Humanware

- Humanware refers to the persons who design , program and operate a computer.
- Specifically, it is about the individual that makes hardware and software components productive.
- The three principle positions for a large computer installation are : **System Analyst, Programmer and Computer Operator.**

- A **systems analyst** is a person who uses analysis and design techniques to solve business problems using information technology.
- Computer **systems analysts** help companies or other organizations use computer technology effectively and efficiently.

Components of a Computer System

- **A Computer programmers** write and test the code that allows computer applications and programs to function.
- A Programmer requires a comprehensive knowledge of programming languages and standard coding procedures.

- A **computer operator** is a role in IT which oversees the running of computer systems, ensuring that the machines, and computers are running properly.
- Monitor and respond to operating and error messages.

Importance and Limitations of Computer

Computer has making human life faster because of its incredible speed, Accuracy and storage, with which human can save anything and search it out easily when needed. We can say computer a versatile machine because it is very flexible in performing their jobs. but Computers have several important **advantages and disadvantages**.

Advantages of computer

Volume of data :

- The computer is suited to handling large volume of data.

Accuracy

- Accuracy is a term used to describe anything that is near its true value or recognized standard.
- For example, a **computer** may perform an accurate math calculation that is correct with the information given, but is not the exact value.

Importance and Limitations of Computer

Repetitiveness :

- Repetition means repeating a sequence of instructions a certain number of times, or until some specific result is achieved.
- In programming terms this means loops of all kinds, such as repeat, for, while, until etc.

Multitasking

- Multitasking is one of the major advantage of computer.
- Person can perform multiple task, multiple operation, calculate numerical problems within few seconds.
- Computer can perform trillion of instructions per second.

Speed

- Now computer is not just a calculating device. Now a day's computer has very important role in human life.
- One of the main advantages of computer is its incredible speed, which helps human to complete their task in few seconds.

Importance and Limitations of Computer

Cost/ Stores huge amount of data

- It is a low cost solution.
- Person can save huge data within a low budget.
- Centralized database of storing information is the major advantage that can reduce cost.

Data Security

- Protecting digital data is known as data security.
- Computer provide security from destructive forces and from unwanted action from unauthorized users like cyber attack or access attack.

Importance and Limitations of Computer

Disadvantage of Computer

As we know advantage comes with disadvantage.

Virus and hacking attacks

- Virus is a worm and hacking is simply an unauthorized access over computer for some illicit purpose.
- Virus is being transferred from email attachment, viewing an infected website advertisement, through removable device like USB etc.

Online Cyber Crimes

- Online cyber-crime means computer and network may have used in order to commit crime.
- Cyber talking and Identity theft are the points which comes under online cyber-crimes.

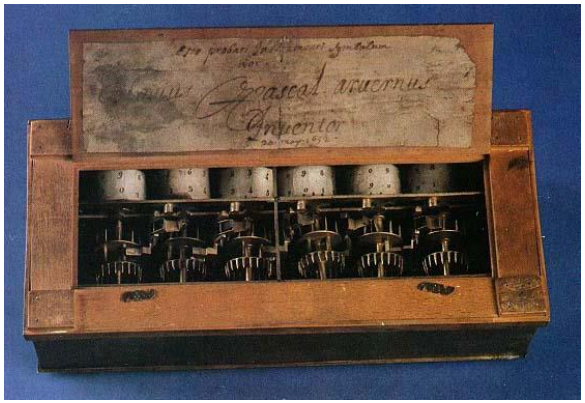
Reduction in employment opportunity

- Mainly past generation was not used of the computer or they have the knowledge of computer they faced a big problem when computer came in field.

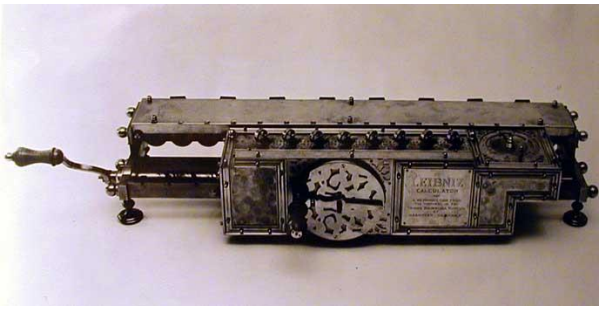
History Of Computers

- Before the **1500s**, in Europe, calculations were made with an **abacus**
  - Invented around 500BC, available in many cultures (China, Mesopotamia, Japan, Greece, Rome, etc.)

- In **1642**, Blaise Pascal (French mathematician, physicist, philosopher) invented a mechanical calculator called the **Pascaline**

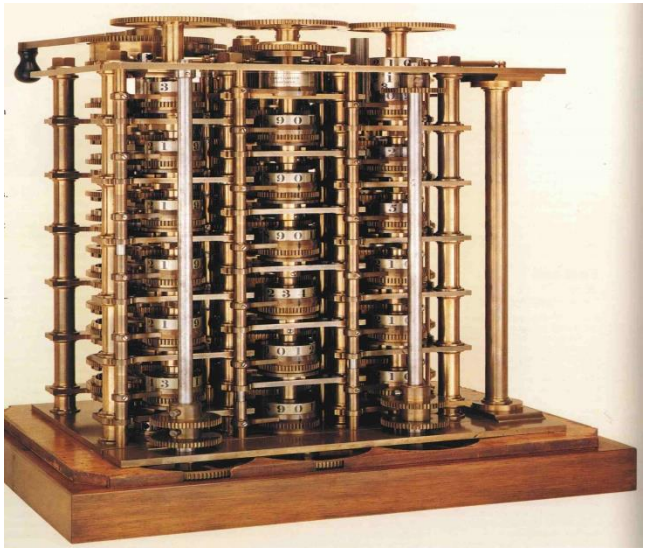


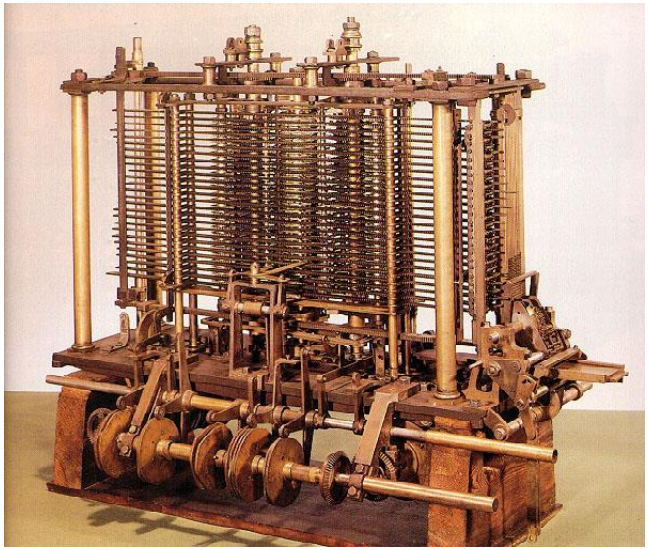
- In **1671,** Gottfried von Leibniz (German mathematician, philosopher) extended the Pascaline to do multiplications, divisions, square roots: the Stepped Reckoner



- **None of these machines had memory**, and they required human intervention at each step

- In 1822 Charles Babbage (English mathematician, philosopher), sometimes called the **"father of computing"** built the Difference Engine
- Machine designed to automate the computation (tabulation) of **polynomial functions** (which are known to be good approximations of many useful functions)
  - Based on the "method of finite difference"
  - Implements some storage
- In 1833 Babbage designed the Analytical Engine, but he died before he could build it
  - It was built after his death, powered by steam





Generations of Computers

- Generation of Computers
  - First Generation (1942-59)
  - Second Generation(1960-65)
  - Third Generation(1965-71)
  - Fourth Generation(1972-present)
  - Fifth Generation(……)

Generation of Computers

Generation 1: Mechanical Calculators

Generation 2: Vacuum Tube Computers

Generation 3: Transistor Computers

Generation 4: Integrated Circuits

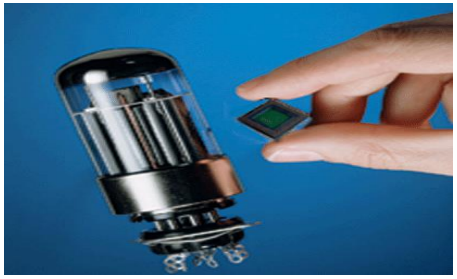
Generation 5: Microprocessors,VLSI

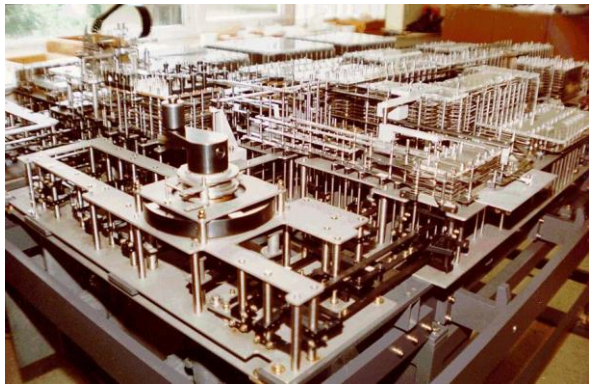
Generation of Computers

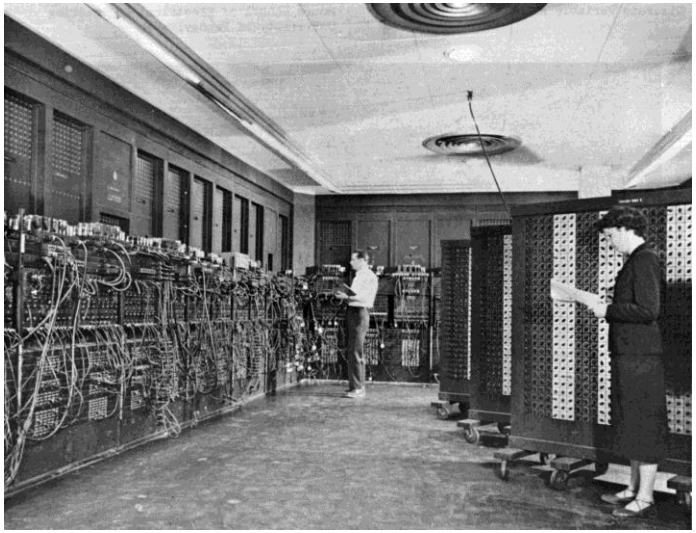
	First Generation	**Second Gen.**	**Third Gen.**	**Fourth Gen.**
Technology	Vacuum Tubes	Transistors	Integrated Circuits (multiple transistors)	Microchips (millions of transistors)
Size	Filled Whole Buildings	Filled half a room	Smaller	Tiny - Palm Pilot is as powerful as old building sized computer

Generation 1 : ENIAC

The ENIAC (Electronic Numerical Integrator and Computer) was unveiled in 1946: the first all-electronic, general-purpose digital computer





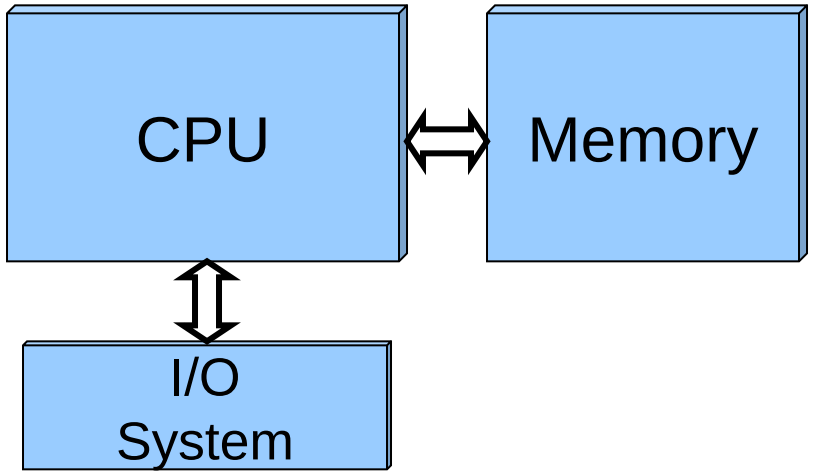


- Claude Shannon (the father of "information theory") had proposed that the use of binary arithmetic and boolean logic should be used with electronic circuits.

The first computer systems used vacuum tubes for circuitry and magnetic drums for memory, and were often enormous, taking up entire rooms.

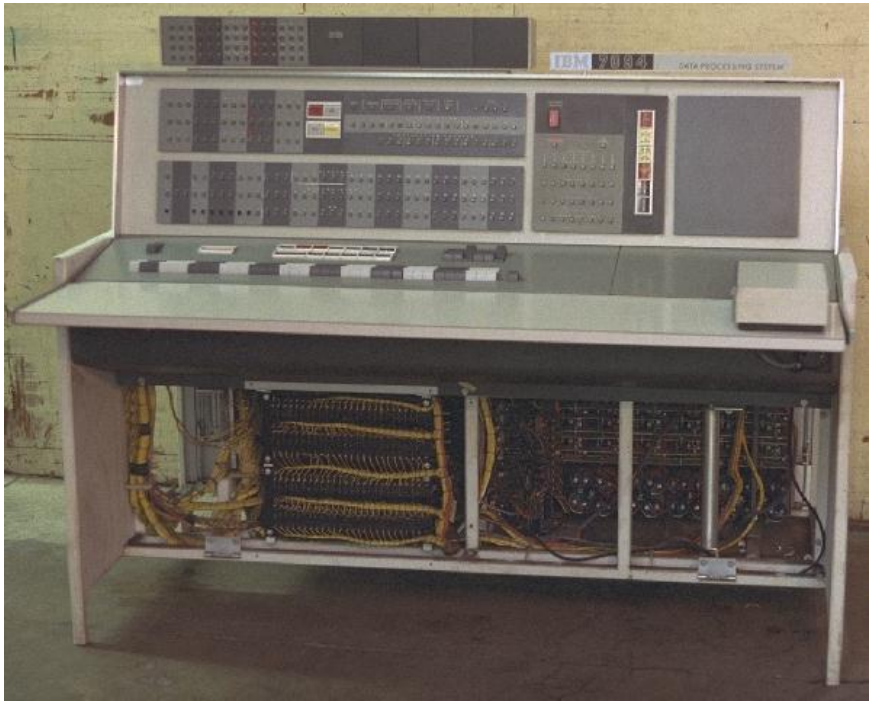
These computers were very expensive to operate and in addition to using a great deal of electricity, the first computers generated a lot of heat.

The Von-Neumann architecture:



Generation 2: IBM7094

- The world would see transistors replace vacuum tubes in the second generation of computers.



The transistor was far superior to the vacuum tube, allowing computers to become smaller, faster, cheaper, more energy-efficient and more reliable than their first-generation predecessors.

- COBOL and FORTRAN.

Generation 3: Integrated Circuits

- Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers.
- Instead of punched cards and printouts, users interacted with third generation computers through keyboards and monitors and interfaced with an operating system

Generation 4: VLSI

- The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip.
- Improvements to IC technology made it possible to integrate more and more transistors in a single chip

  SSI (Small Scale Integration): 10-100

  MSI (Medium Scale Integration): 100-1,000

  LSI (Large Scale Integration): 1,000-10,000

  VLSI (Very Large Scale Integration): >10,000

  - Example: The Intel 4004 chip.

Generation 5?

- The term “Generation 5” is used sometimes to refer to all more or less “sci fi” future developments
  - Voice recognition
  - Artificial intelligence
  - Quantum computing
  - Bio computing
  - Nano technology
  - Learning
  - Natural languages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8:37
Tuesday, February 17, 2004
T-Mobile
Call Log
Voice Mail
Setup Wireless E-mail
Owner: Jane Wall
(206) 555-1234
Tomorrow: Review Partnership Program
8:00AM-12:00PM
ActiveSync: 5 Unread messages
10 Active tasks
New
iPAQ
T-Mobile


VAIO