COMPUTER FUNDAMENTALS

CONTENTS

- Overview
- Introduction to Computers
  - Characteristics of Computers
  - History/Evolution
  - Generation Of Computers

Introduction To Computers

- Definition:
  - Its an electronic Device that is used for information Processing.
  - Computer.. Latin word.. compute
  - Calculation Machine
- A computer system includes a computer, peripheral devices, and software

Introduction To Computers

- Accepts input, processes data, stores data, and produces output
- ***Input*** refers to whatever is sent to a Computer system
- ***Data*** refers to the symbols that represent facts, objects, and ideas
- ***Processing*** is the way that a computer manipulates data
- A computer processes data in a device called the ***central processing unit*** (CPU)

Introduction To Computers

- ***Memory*** is an area of a computer that holds data that is waiting to be processed, stored, or output
- ***Storage*** is the area where data can be left on a permanent basis
- Computer ***output*** is the result produced by the computer
- An output device displays, prints or transmits the results of processing

Introduction To Computers

Computer

- Performs computations and makes logical decisions
- Millions / billions times faster than human beings

Computer programs

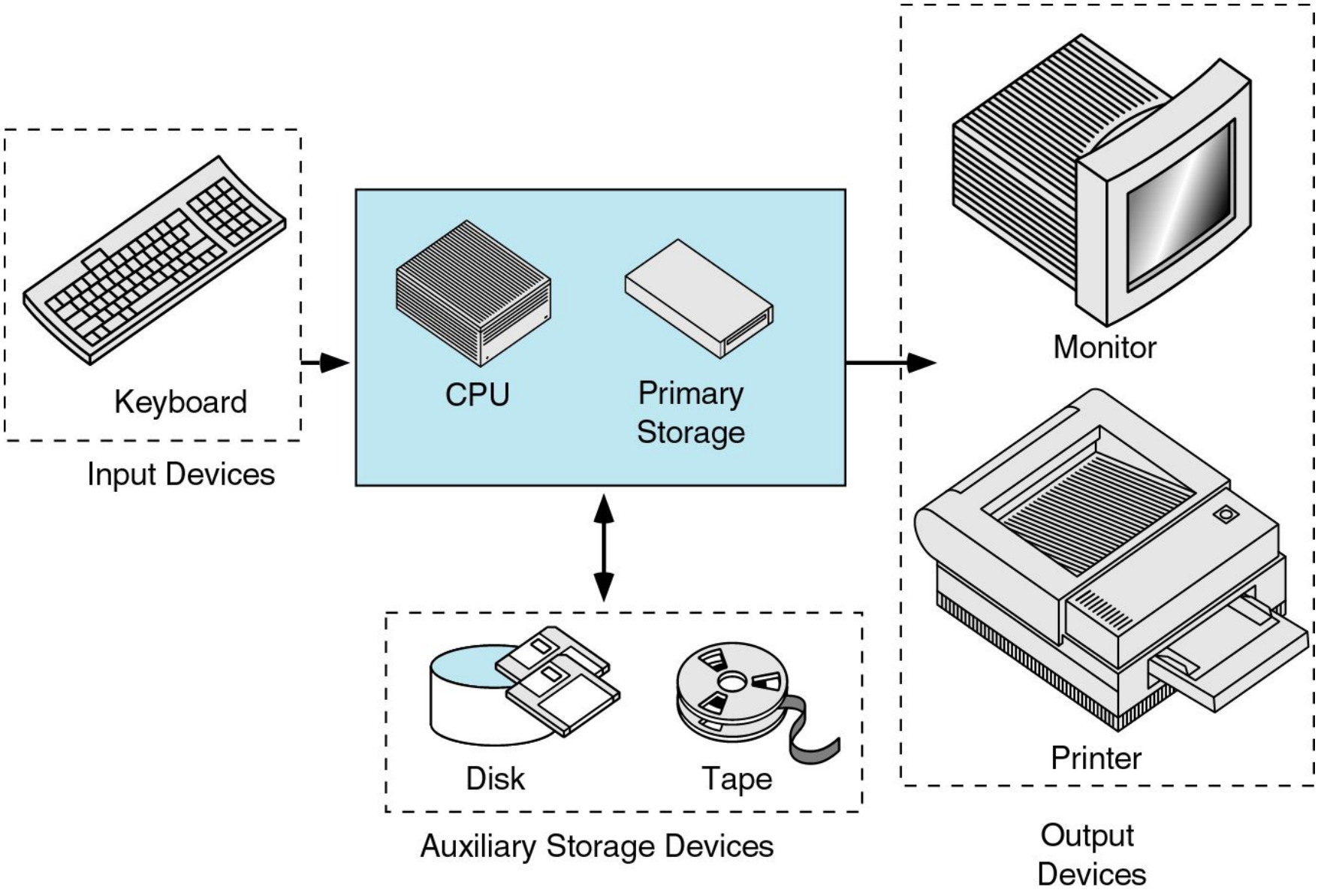
- Sets of instructions for which computer processes data

Hardware

- Physical devices of computer system

Software

- Programs that run on computers


Keyboard
Input Devices
CPU
Primary Storage
Monitor
Printer
Output Devices
Disk
Tape
Auxiliary Storage Devices

Introduction To Computers

- Capabilities of Computers
  - Huge Data Storage
  - Input and Output
  - Processing

Introduction To Computers

- Characteristics of Computers
  - High Processing Speed
  - Accuracy
  - Reliability
  - Versatility
  - Diligence

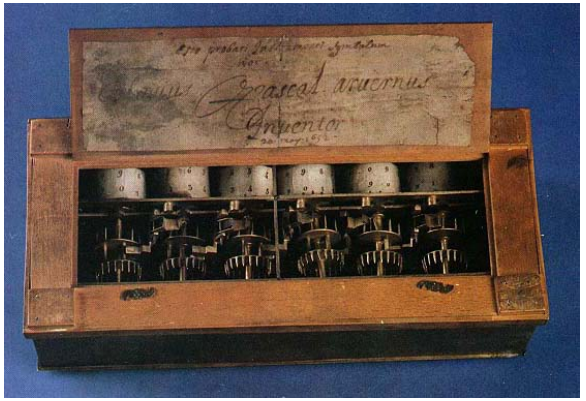
Introduction To Computers

History Of Computers

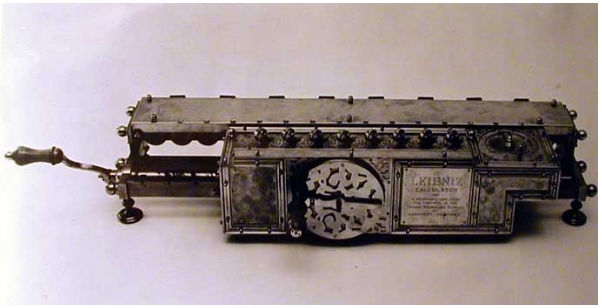
- Before the 1500s, in Europe, calculations were made with an abacus

  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

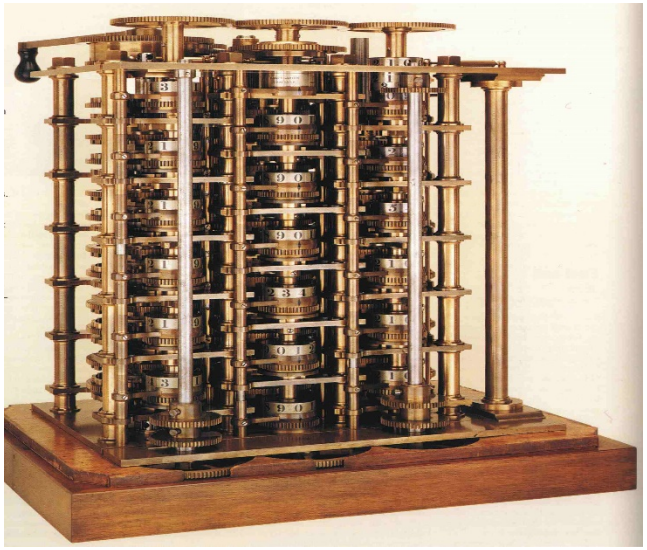


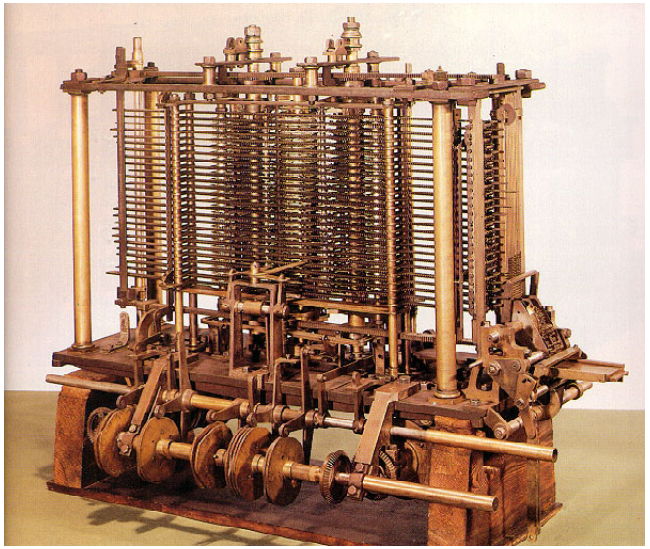
None of these machines had memory, and they required human intervention at each step

- 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





Introduction To Computers

Generations of Computers

Introduction To Computers

- Generation of Computers
  - First Generation (1946-59)
  - Second Generation(1957-64)
  - Third Generation(1965-70)
  - Fourth Generation(1970-90)
  - Fifth Generation(1990 till date)

Introduction To Computers

Generation 0: Mechanical Calculators

Generation 1: Vacuum Tube Computers

Generation 2: Transistor Computers

Generation 3: Integrated Circuits

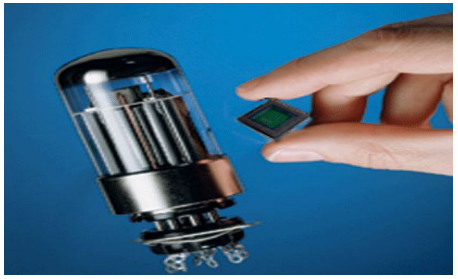
Generation 4: Microprocessors

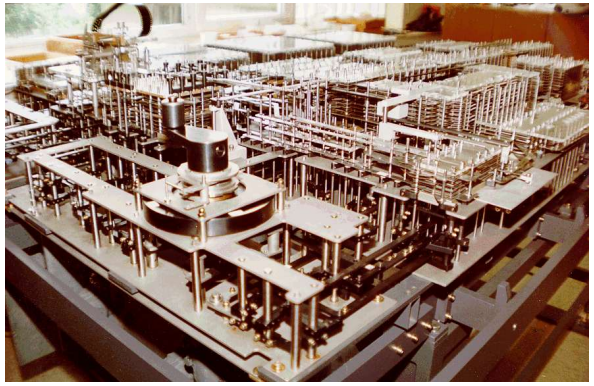
Introduction To Computers

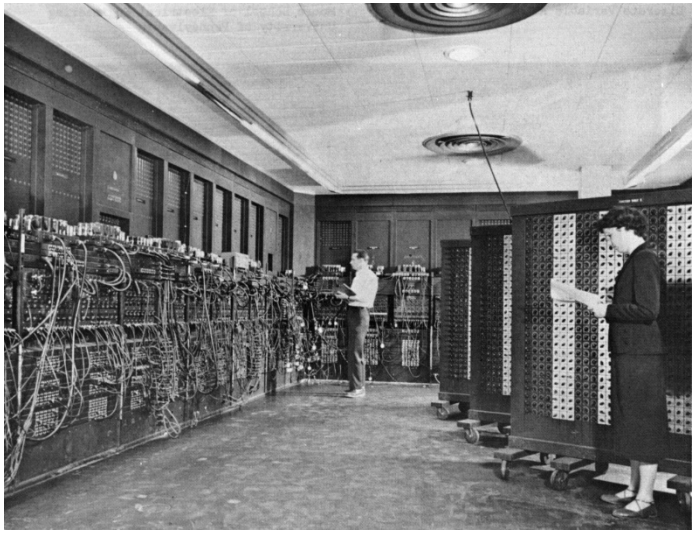
	First Generation	Second Gen.	Third Gen.	Fourth Gen.
Technology	Vacuum Tubes	Transistors	Integrated Circuits (multiple transistors)	Microchips (millions of transistors)
Size	Filled Whole Buildings	Filled half a room	Smaller	Tiny - Palm Pilot is as powerful as old building sized computer

Generation 1 : ENIAC

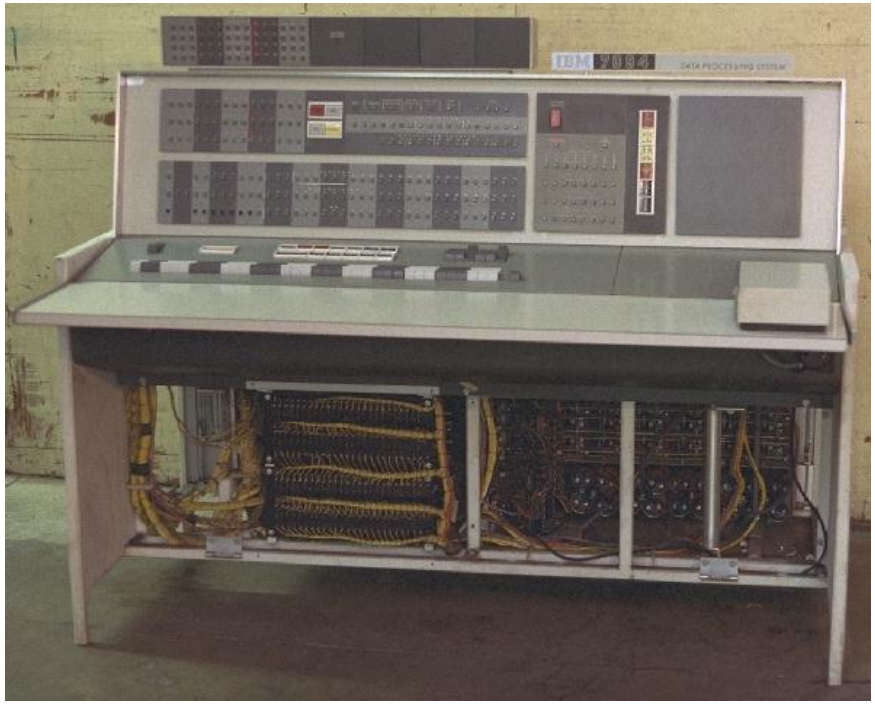
The ENIAC (Electronic Numerical Integrator and Computer) was unveiled in 1946: the first all-electronic, general-purpose digital computer







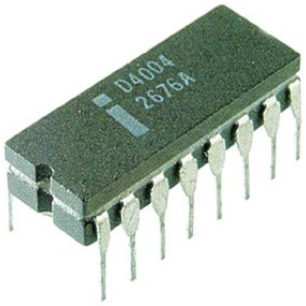
Generation 2: IBM7094



Generation 3: Integrated Circuits

Seymour Cray created the Cray Research Corporation
Cray-1: $8.8 million, 160 million instructions per seconds and 8 Mbytes of memory

Generation 4: VLSI



Microprocessors

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

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

Start
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: 6 Unread messages
10 Active tasks
New
iPAQ
T··Mobile·

VAIO