

COMPUTER PRESENTATION

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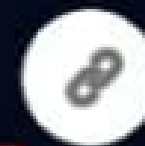
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# What is computer and Data processing?



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## What is a computer?

A computer is an electronic device that manipulates information, or data. It has the ability to store, retrieve, and process data.

## What is Data processing?

Data processing is, generally, "the collection and manipulation of items of data to produce meaningful information."

Data processing occurs when data is collected and translated into usable information.



# Computer generation

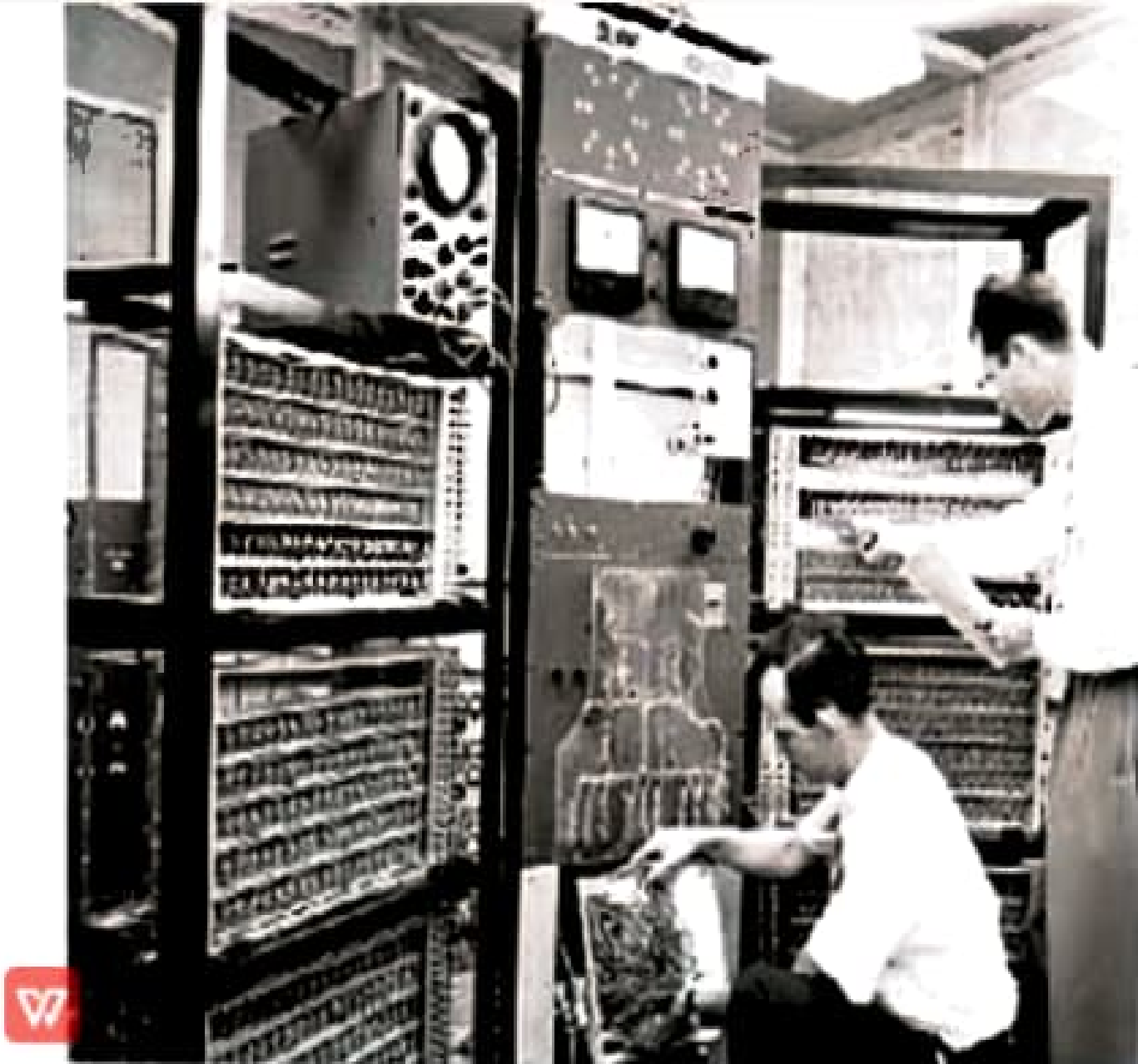


&  
Registers

# 1st Generation Computer

The period of first generation was from 1946-1959

- Vacuum tube technology
- Unreliable
- Supported machine language only
- Very costly
- Generated a lot of heat
- Slow input and output devices
- Huge size
- Need of AC
- Non-portable
- Consumed a lot of electricity

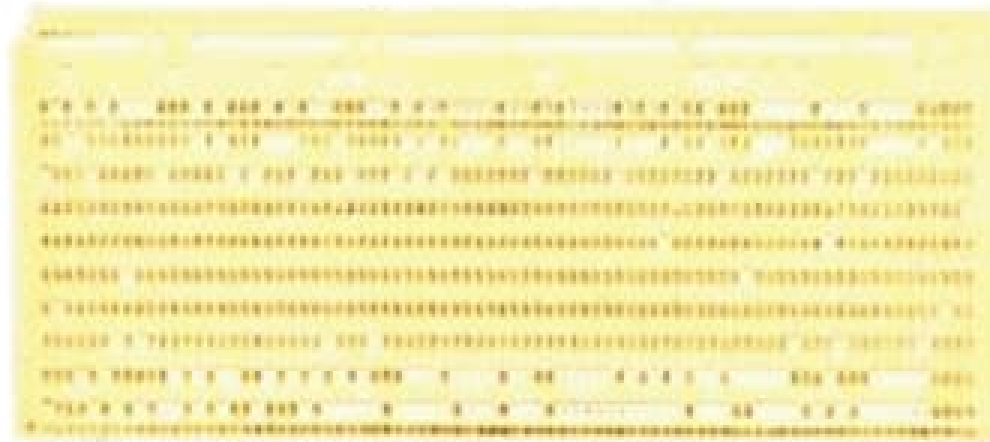


## 2nd generation computers. (1957-1963)

- Use transistor technology
- Computation time: microseconds
- Smaller size than 1st generation computer
- Support machine language
- Use primary and secondary
- Input as punch cards
- Output as printout



Example of a punch card



**Punch cards** (or "**punched cards**"), also known as **Hollerith cards** or **IBM cards**, are paper **cards** where holes may be **punched** by hand or machine to represent **computer** data and instructions. They **were** a widely-used means of inputting data into early **computers**.



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## 3rd Generation computers (1964-1971)

The main features of the third-generation computers were that they,

- used Integrated Circuits,
- reliable in comparison to previous two generations,
- smaller in size,
- generated less heat,
- faster in terms of speed,
- lesser maintenance,
- still costly,
- consumed lesser electricity.



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## 4th Generation Computers (1972-1980)

- Very cheap
- Portable and reliable
- Use of PCs
- Very small size
- Pipeline processing
- No AC required
- Concept of internet was introduced
- Great developments in the fields of networks
- Computers became easily available



# 5th Generation Computers (1980-present)

- ULSI technology
- Development of true artificial intelligence
- Development of Natural language processing
- Advancement in Parallel Processing
- Advancement in Superconductor technology
- More user-friendly interfaces with multimedia features
- Availability of very powerful and compact computers at cheaper rates





# Registers in Computer

Registers are a type of computer memory used to quickly accept, store, and transfer data and instructions that are being used immediately by the CPU



## MEMORY DATA REGISTER



The memory data register is used to store the data that will be stored or will be fetched from the computer memory i.e. Random-access Memory (RAM). The main use of the memory data register is to act as a buffer as it can store anything that can be copied from the computer memory and can be used by the processor for further operations. The memory data register stores the data before the data is transferred to the decoder.

## General purpose registers

: This is used to store data intermediate results during program execution. It can be accessed via assembly programming.

These are numbered as R0, R1, R2....Rn-1, and used to store temporary data during any ongoing operation. Its content can be accessed by assembly programming. Modern CPU architectures tends to use more GPR so that register-to-register addressing can be used more, which is comparatively faster than other addressing modes



## Program Counter

The other name for the program counter register is instruction address register (IAR) or IC (instruction counter). The program counter is used to indicate the current position of program sequence in a computer system. When any instructions are fetched from the memory the value of the program counter is incremented by one and point to next instruction that need to be executed by the processor of the central processing unit (CPU)





### Instruction Register (IR):

The IR holds the instruction which is just about to be executed. The instruction from PC is fetched and stored in IR. As soon as the instruction is placed in IR, the CPU starts executing the instruction and the PC points to the next instruction to be executed.





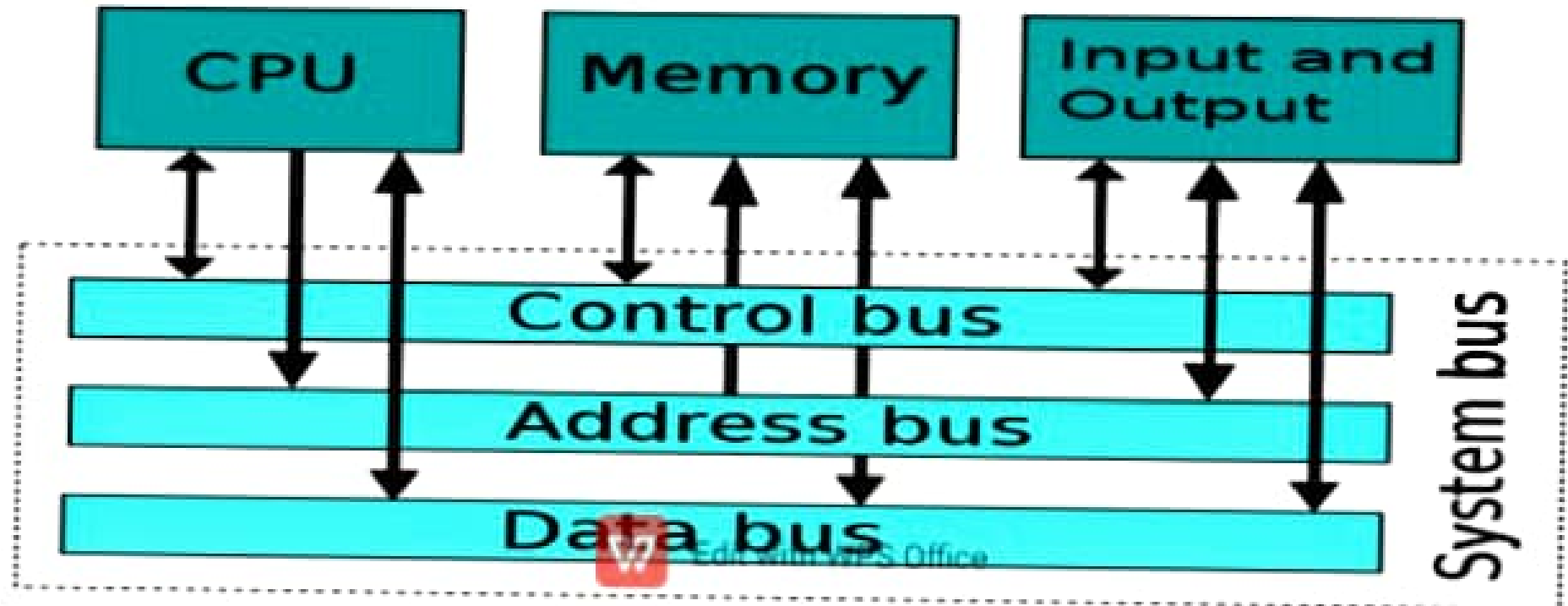
# Bus Architecture



Bus is a group of wires that connects different components of the computer. It is used for transmitting data, control signal and memory address from one component to another. A bus can be 8 bit, 16 bit, 32 bit and 64 bit. A 32 bit bus can transmit 32 bit information at a time. A bus can be internal or external.



**A system bus is a single computer bus that connects the major components of a computer system, combining the functions of a data bus to carry information, an address bus to determine where it should be sent, and a control bus to determine its operation. The technique was developed to reduce costs and improve modularity, and although popular in the 1970s and 1980s, more modern computers use a variety of separate buses adapted to more specific needs.**



# INSTRUCTION SET

This basically means that an ISA describes the design of a Computer in terms of the basic operations it must support.

1) Data transfer: Move, store, clear

2) Arithmetic: +, -, \*, ++, --

3) Logical: and or not

4) Conversion: translate, convert

5) I/O: Read, write



# INSTRUCTION SET

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2) Arithmetic:  $+$ ,  $-$ ,  $*$ ,  $++$ ,  $--$

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4) Conversion: translate, convert

5) I/O: Read, write

6) System control: Read or modify

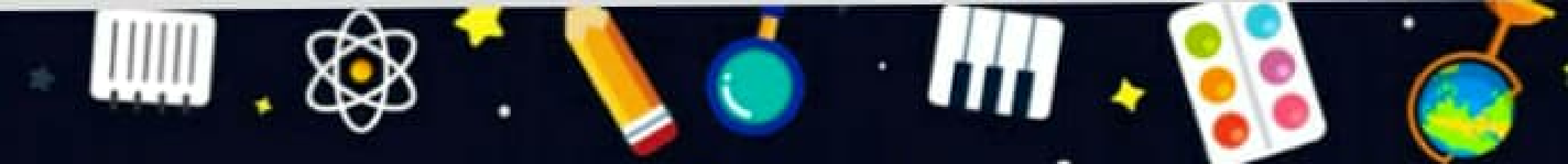
7) Transfer of control: update the program



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# Input and output devices





**Input Device Definition:** A piece of equipment/hardware which helps us enter data into a computer is called an input device. For example keyboard, mouse, etc.

**Output Device Definition:** A piece of equipment/hardware which gives out the result of the entered input, once it is processed (i.e. converts data from machine language to a human-understandable language), is called an output device. For example printer, monitor, etc.



## **Keyboard**

A simple device comprising keys and each key denotes either an alphabet, number or number commands which can be given to a computer for various actions to be performed

## **Mouse**

It is also known as a pointing device

Using mouse we can directly click on the various icons present on the system and open up various files and programs

## **Joy Stick**

It is a device which comprises a stick which is attached at an angle to the base so that it can be moved and controlled

Mostly used to control the movement in video games



## **Light Pen**

It is a wand-like looking device which can directly be moved over the device's screen



## **Microphone**

Using a microphone, sound can be stored in a device in its digital form  
It converts sound into an electrical signal

## **Scanner**

This device can scan images or text and convert it into a digital signal  
When we place any piece of a document on a scanner, it converts it into a digital signal and displays it on the computer screen

## **Barcode Reader**

It is a kind of an optical scanner  
It can read bar codes

A source of light is passed through a bar code, and its aspects and details are displayed on the screen





## **Output devices**

### **Monitor**

The device which displays all the icons, text, images, etc. over a screen is called the Monitor

### **Printer**

A device which makes a copy of the pictorial or textual content, usually over a paper is called a printer

### **Speakers**

A device through which we can listen to a sound as an outcome of what we command a computer to do is called a speaker

### **Projector**

An optical device which presents an image or moving images onto a project screen is called a projector

### **Headphones**



A decorative border at the top and bottom of the slide features various educational icons: a white comb, a white atomic symbol, a yellow star, a yellow pencil, a blue globe, a white piano keyboard, a white palette with colored dots, and a globe with a magnifying glass. The background is dark blue with small white stars.

# THANK-YOU

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