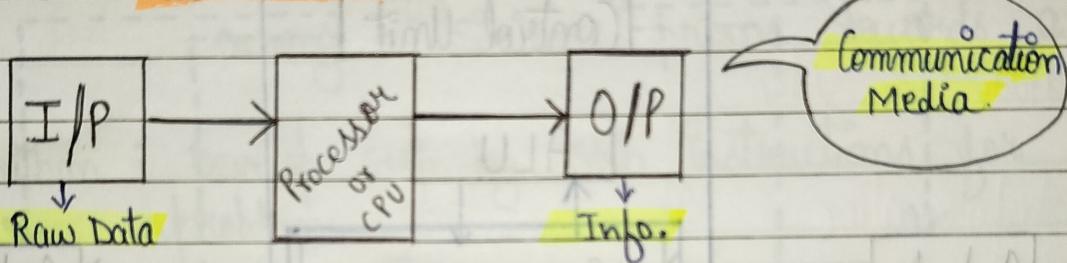


Computer Introduction.

- Full Form of COMPUTER: Commonly Operating Machine Purposely Used for Technology & Education Research.

The Computer word derived from Compute which means "to calculate".

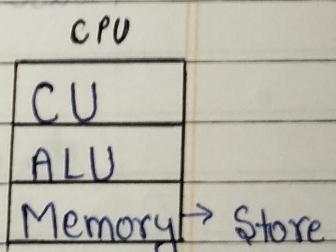


Computer understands only Binary language i.e. 0, 1.

CPU: Brain of the Computer

I/P: Keyboard, Mouse, Scanner, Joystick

O/P: Printer, Monitor, Speaker, Headphones



Arithmetic & Logical Unit

↓ AND, OR, NOT, Comparison (>, <, =).

Add, Sub, Multiply, division.

→ Primary (Temp.) → RAM / ROM.

Memory

→ Secondary (Permanent) → Hard Disk, SSD, PD.

Computer is an electronic device that takes raw data as input from user & process this data under the control of set of instruction & gives results (O/P).

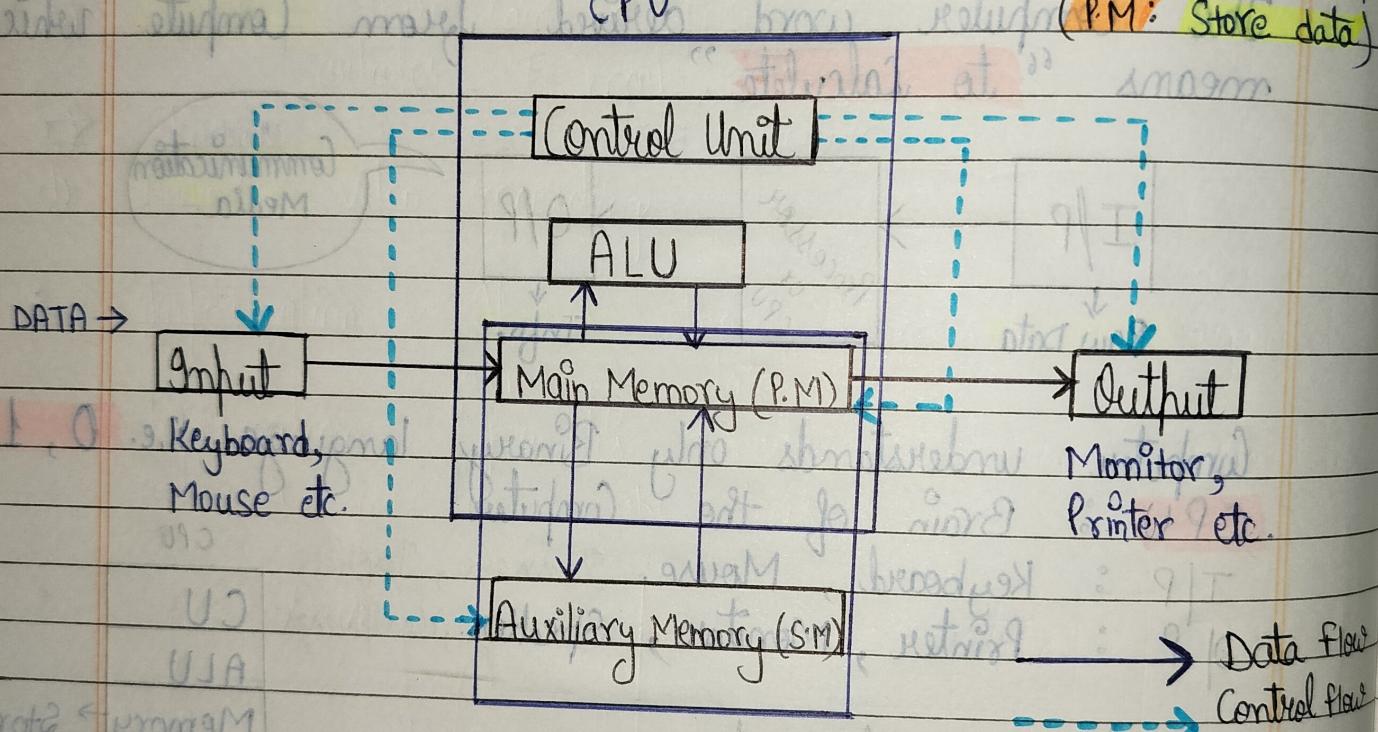
DATA → Numeric Data (Eg. Roll No.)
 Alphabetic Data (Eg. Name)
 Alphanumeric Data (Eg. PW)

Block Diagram :

(CU: Supervisor)

(ALU: Performing operation)

(P.M: Store data)



Execution Cycle → Fetch, Decode, Execute.

Computational Thinking:

CT is define as the process of formulation & Solving problems by breaking them down into simple steps.

CT is the step that comes before programming.

C.T involves 4 Steps:

1. **Process of Decomposition**: Decomposition involves breaking a complex problem down into smaller more manageable parts.

2. **Pattern Recognition**: Identifying pattern or trends within a problem.

3. **Abstraction**: Identify specific similarities & differences among similar problems towards a solution.

4. **Algorithm**: Develop step by step instructions for solving the problem.

Q: find the sum of all nos. b/w 1 & 200.

Step 1. Process of Decomposition.

Step 2. Pattern Recognition.

How many times 201 pattern repeats,

$$200/2 = 100 \text{ pairs}$$

Step 3. Abstraction

total no. of pairs = 100

Sum of every pair = 201

then, the total sum = $201 \times 100 = 20,100$

Step 4. Algorithm.

$$\text{Step 1. } 200 + 1 = 201$$

$$\text{Step 2. } 200/2 = 100$$

$$\text{Step 3. } 201 \times 100 = 20,100$$

Q: find the sum of all nos. b/w 1 to 1000.

$$\text{Step 1. } 1000 + 1 = 1001$$

$$\text{Step 2. } 1000/2 = 500$$

$$\text{Step 3. } 1001 \times 500 = 500,500$$

- Data : Data refers to raw, unorganised/unprocessed facts & figures that are collected & stored. It can be in form of nos., text, img or any other type data.

Examples :-

- a) Raw Number - Roll No, temp, Pressure, Population Count
- b) Text - This can be the written content in book, articles, E-mails, etc.
- c) Images
- d) Audio & video recording

- Information : It is the processed and organised form of data.

Information provides meaning & can be used to answer ques or make decision.

Data

Data is unorganized & unrefined facts.

Data doesn't depend on information.

Data typically comes in the form of graphs, numbers, figures.

Raw data is alone is insufficient for decision making.

Information

Information Comprises processed, organized data presented in a meaningful context.

Information depends on data.

Information is typically presented through words, language, thoughts & ideas.

It is sufficient for decision making.

Data is an individual unit that contains raw materials which do not carry any specific meaning.

Information is the group of data that collectively carries a logical meaning.

10/09/24

• (American Standard Code for Information Interchange)

• Different Data Types

1) Text Data : Text data consist of word, paragraphs, sentences.

Text is normally stored as ASCII code.

A → 65
a → 97

→ it is a 7 bit code mostly
 $2^7 = 128$. Combination can be made

2) Numeric Data : Numeric data consist of number digits from 0 to 9. It may also contain decimal points, +ve sign, -ve sign

Representation of Number

Fixed point

- 23.22

Sign Bit	Integer	rational

Floating point

$$(23.22)_2 = 2 \cdot 322 \times 10$$

$$(103.021)_2 = 1.001 \times 2^9$$

Mantissa Exponent

Binary Representation

(+, -) Signed Rep.

Signs are taken as

Sign magnitude

Ex. 111

1's Complement

1000

2's Complement

1001

Unsigned Rep. (+)

no signs are taken

→ -ve no. always stored in complement.

3) Sound : Sound is a representation of audio.
Audio data include speech, music etc.

4) Picture / Image : This type of data include image, drawing, photo, graph etc.

- Represented by bit pattern.
- Composed of Pixels.
- Each pixel can be represented by a binary.

↳ Sound - audio data include speech, music, etc.

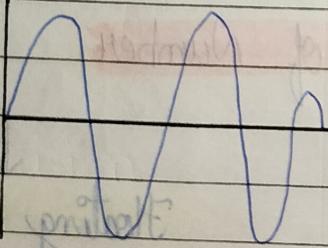
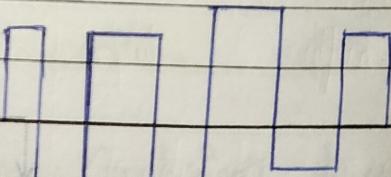
all are analog data → which can be measured

quantitative data

qualitative data

Numeric. P at 0 cmf Audio data, voice, pressure, temp

hardware
Analog
↓
Digital



time

• fixed pt. - when the digits are fixed after decimal
Ex: 12.35

• floating pt. - way to big or small number is stored

Ex: 1.23×10^{32} ← 12.32 × 10^{32}
 1st Bit Sign bit Mantissa [8 bit] Exponent [16 bit] exponent

2⁶ 2¹ 2⁰

→ Image / Picture -

Image divides into pixels each pixel assigned to a bit pattern.

Ex 1: 1 bit pattern

0	1	0	0
0	1	0	0
1	0	1	0
1	0	1	1
0	1	0	1

0 - white
1 - Black
B/w Img.

00	01	10	11
10	00	11	10
10	01	11	10
11	11	01	10
01	01	11	00

00 - white
01 - light gray
10 - dark gray
11 - black.

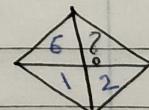
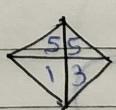
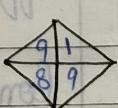
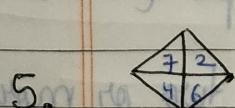
Colour Depth: The no. of bits being used per pixel.

+ Classic Puzzle Solving.

1. 17, 23, 16, 24, 15, 25, 14, ?
26.

2. $1+4=5$, $2+5=12$, $3+6=21$, $8+11=?$

3. $2, 4, 8, 14, 22, 32, ?$



6. A rabbit saw 6 elephants while going towards river. Every elephant saw 2 monkeys are going towards river. Every monkey hold 1 tortoise in their hand. How many animals are going towards the river? 5