BCA 101: Fundamentals of Computers & Information Technology

Semester 1 – Exam Prep Notes

Compilation of:
Class Notes, YouTube Lectures,
Textbook Summaries & Exam Papers.

Notes By ~ Kamal Kishor

Unit 1: What is a Computer?

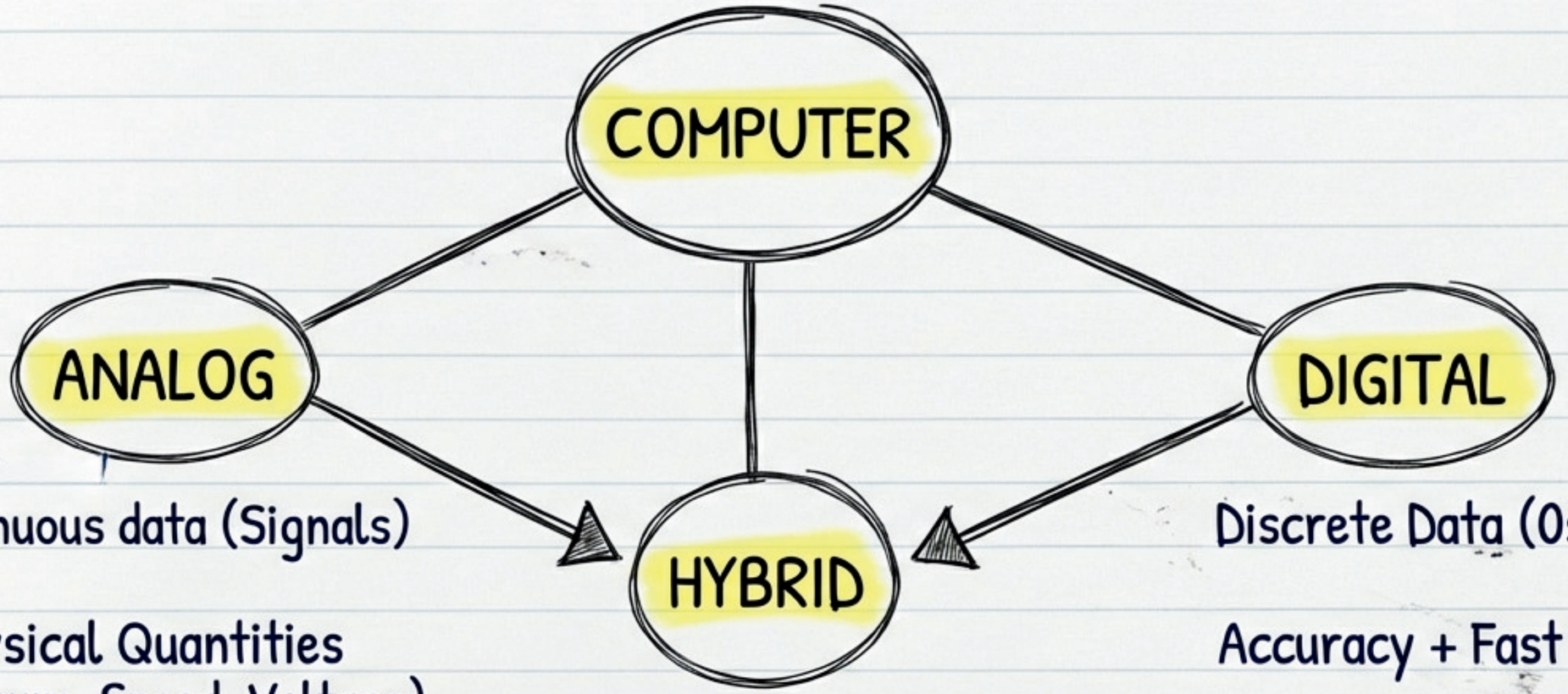
Definition: An electronic device derived from 'TO COMPUTE' (Calculate).

The 'Data Processor' Concept: Stores, processes & retrieves data.

Characteristics of Computer

- Automatic (Works without intervention)
- Accuracy (High degree, errors are human)
- Speed (Microseconds, billions of calculations/sec)
- Diligence (No tiredness or lack of concentration)
- Versatility (Exam results -> Electricity bills)
- Power of Remembering (High storage)
- No I.Q. (Zero intelligence)
- No Feelings (Machine logic)

Classification of Computers



Continuous data (Signals)

Physical Quantities
(Pressure, Speed, Voltage)

Examples: Speedometer,
Thermometer, Voltmeter.

Discrete Data (0s and 1s)

Accuracy + Fast Results

Hybrid = Speed of + Accuracy
Analog of Digital

Examples: Hospital ICU Machines (Heartbeat),
Petrol Pumps, Weather Forecasting.

Types of Digital Computers

Micro Computers

- Small, Low Cost, Single User.
- Uses Microprocessor (CPU).
- Examples: Desktop, Laptop, Tablet, PDA.

Mini Computers

- Medium size, more powerful than Micro.
- Multi-user support.
- Examples: IBM AS 400, HP 3000, DEC PDP 11.

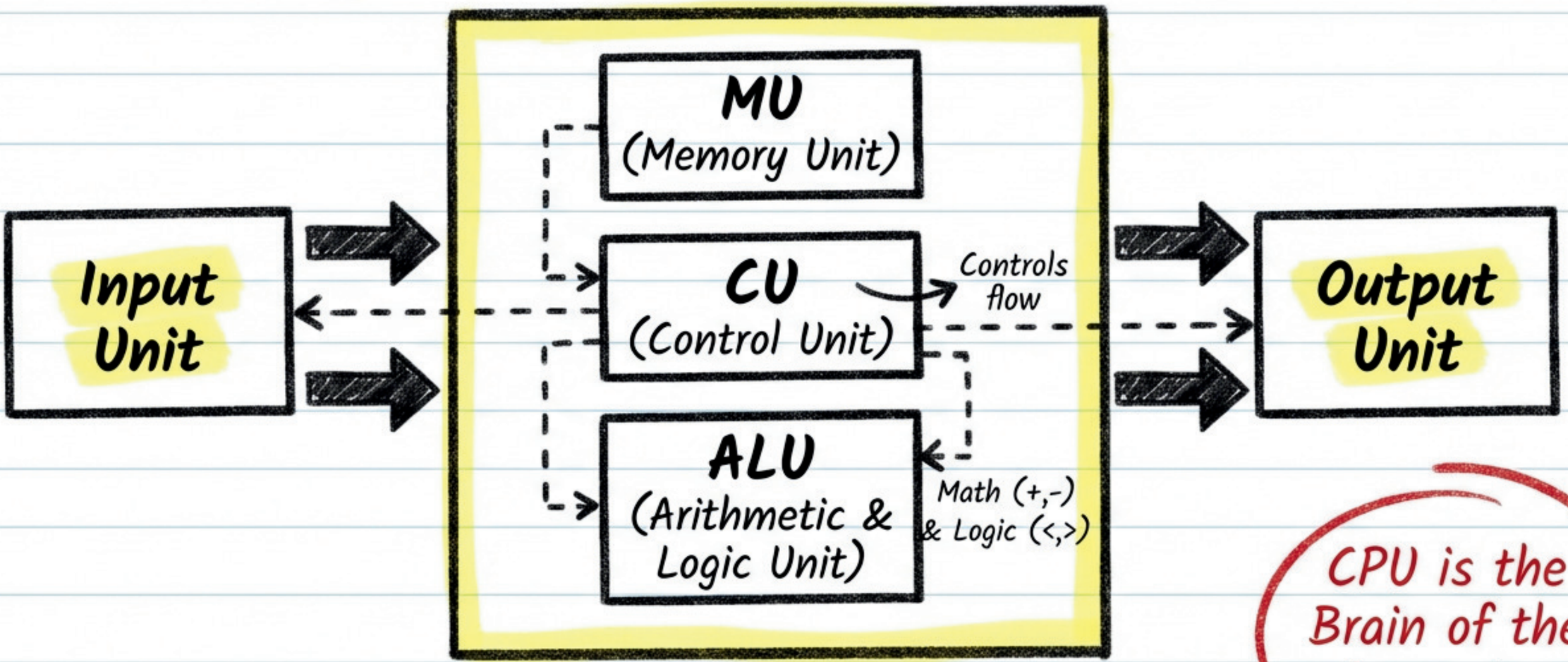
Mainframe Computers

- Large, for Critical Organizations (Banking, Airlines).
- Handles 100s/1000s of users 24x7.
- Secure & Reliable.
- Examples: IBM Z Series.

Super Computers

- Fastest & Most Powerful.
- Complex calculations (Research, Space, Weather).
- Examples: PARAM (India), Fugaku (Japan), Pratyush.

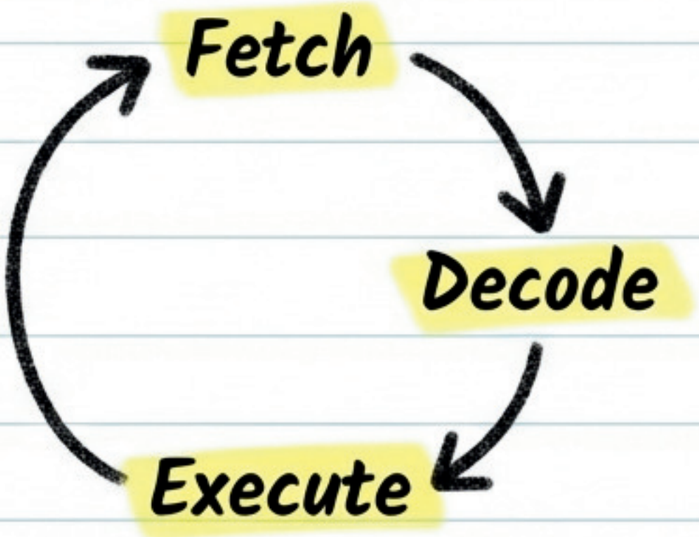
Anatomy of a Computer (Block Diagram)



CPU is the Brain of the Computer.

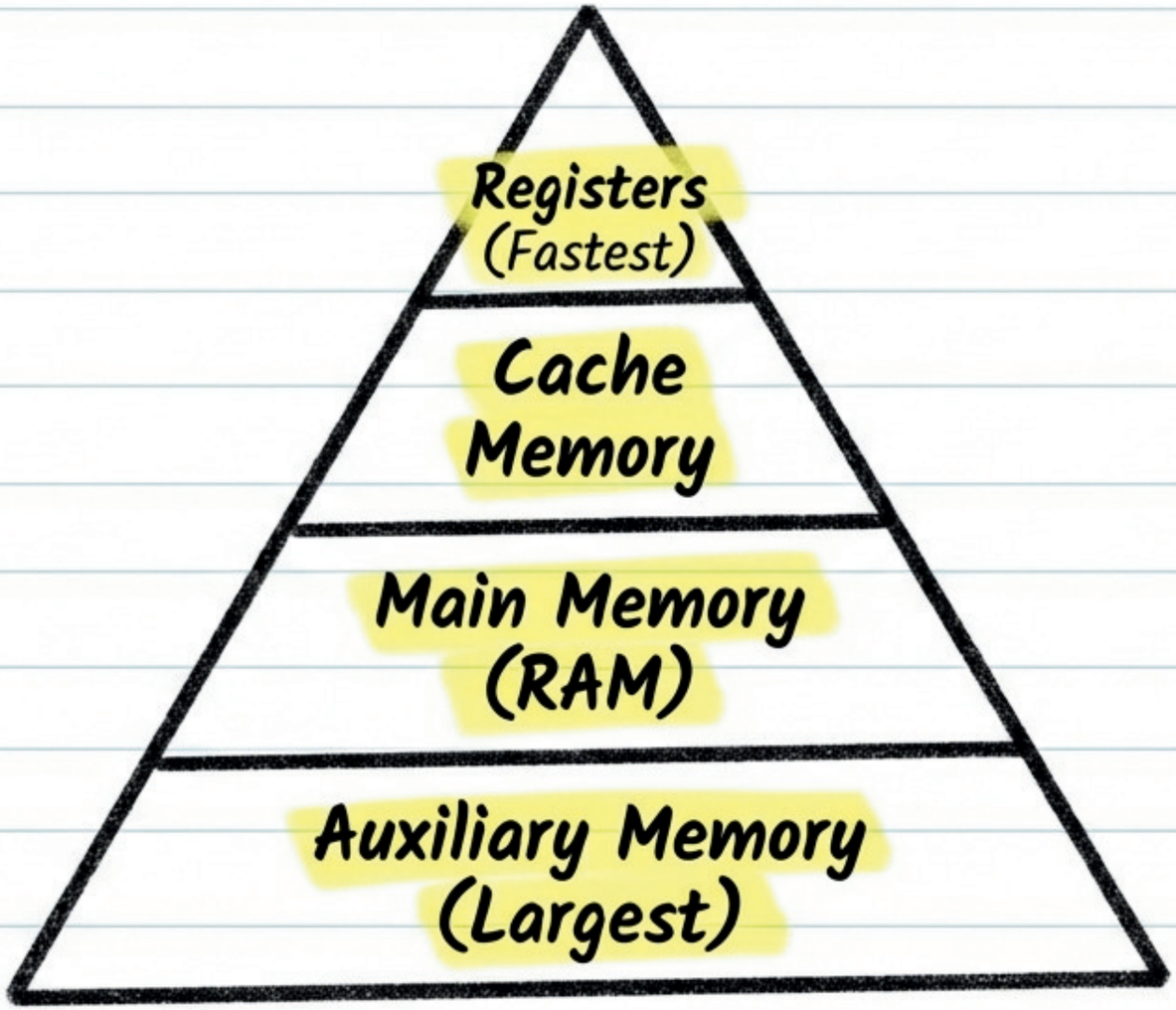
Architecture & Memory Org.

Instruction Cycle:



Logic Microoperations:

- Adder-Subtractor
- Shift Microoperations



Exam Q: What is a Physical Address?

Data Representation: Number Systems

Binary to Decimal Conversion Example:

$$(110101.11)_2 = (?)_{10}$$

$$= 1\times2^5 + 1\times2^4 + 0\times2^3 + 1\times2^2 + 0\times2^1 + 1\times2^0 + 1\times2^{-1} + 1\times2^{-2}$$

$$= 32 + 16 + 0 + 4 + 0 + 1 + 0.5 + 0.25$$

$$= \boxed{53.75_{10}}$$

Binary	Hex	Decimal
1010	A	10
1011	B	11
1100	C	12
1101	D	13
1110	E	14
1111	F	15

Hex Example: $(E1.399)_H$

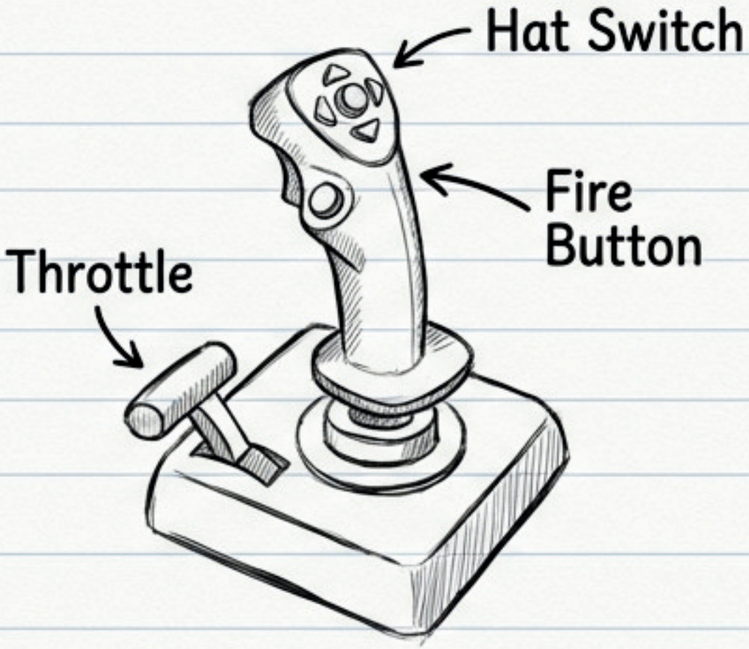
I/O Devices

I/O Devices

Input Devices:

1. Scanners:
   - Flatbed: Glass plate, light moves horizontally.
   - Handheld: LEDs in small case. Must be dragged carefully & steadily over document.

2. Joystick (Gaming/Flight):



3. Touch Screens & PDAs:
   - Apple Newton (Personal Digital Assistant).
   - Used in Kiosks.

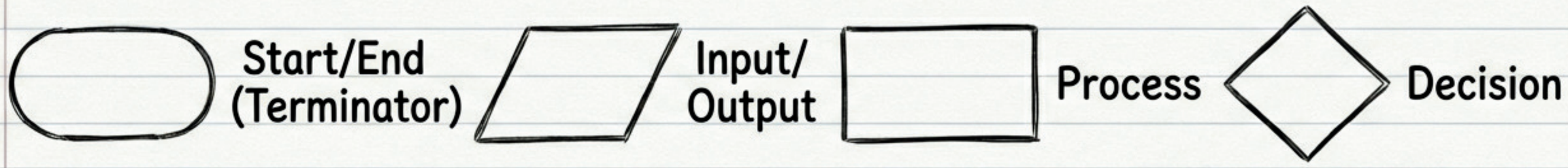
Output Devices:

1. Plotters:
   - Draws curves using sequence of short straight lines.
   - Pen-based drawing.

Problem Solving: Flowcharts

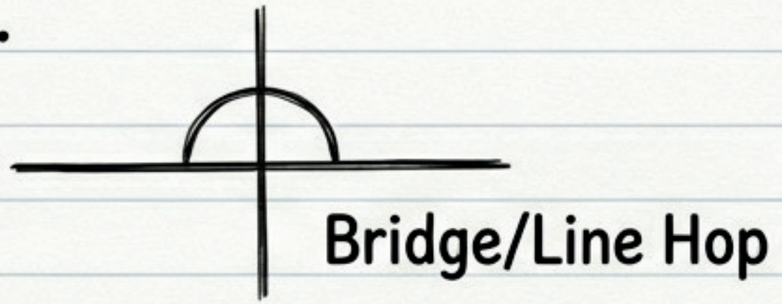
Schematic representation of a process.

Symbol Key

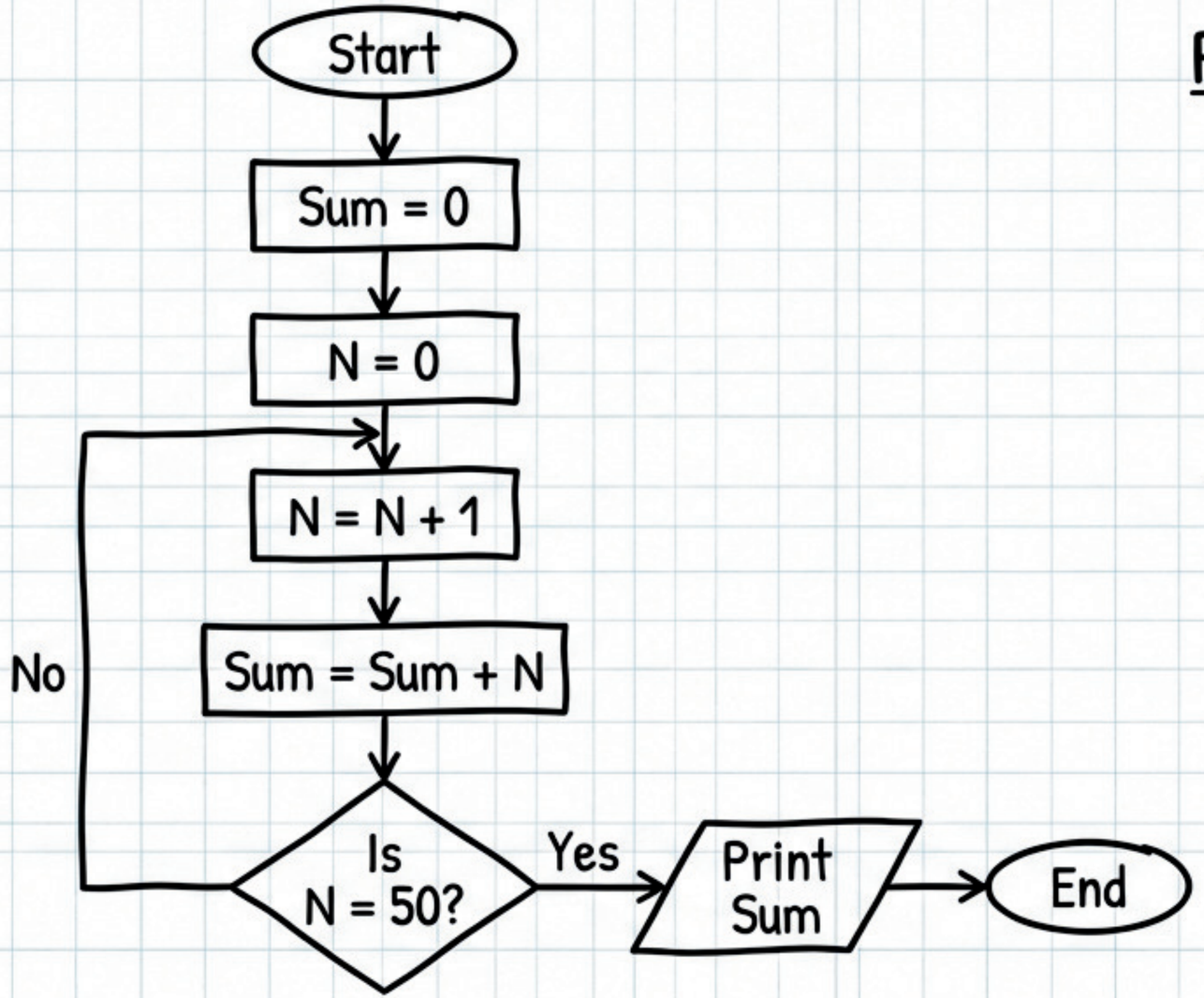


Rules:

- Flow from Top to Bottom, Left to Right.
- Avoid crossing lines.



Logic Example: Sum of First 50 Natural Numbers



Pseudocode Concepts:

- SEQUENCE (Linear)
- WHILE (Loop with test at top)
- REPEAT-UNTIL (Loop with test at bottom)
- IF-THEN-ELSE (Decision)

IF Temperature > Freezing
THEN Increment Total

Permanent Marker, Software & Operating Systems

Types of Software

1. System Software: Connects User <-> Hardware. (e.g., OS: Windows, Linux, Mac).
2. Application Software: Productivity. (e.g., Word, PowerPoint).
3. Utility Software: Maintenance. (e.g., Antivirus, Disk Cleanup).

Operating System Concepts (Exam Terms):

- Multitasking OS: Running multiple jobs at once.
- Dual Booting: Installing two OS on one machine.
- Unix: System structure.

Spreadsheet Tools: MS Excel

Rule: Formula always starts with '=' sign.

Operators:

- Arithmetic: +, -, *, /, ^, %
- Logical: =, >, <, >=, <>, <=
- Text: & (Ampersand for joining)

Key Functions:

- =SUM(A2:A8) –> Adds range
- =AVERAGE(9,81) –> Calculates mean
- =SQRT(9) –> Returns 3
- =ABS(-45) –> Returns 45 (Absolute value)

Addressing:

- Relative: A1 (Changes when copied)
- Absolute: D10 (Fixed with dollar sign)

DBMS & FoxPro Commands

- DBMS = Storing, retrieving & managing data efficiently.
- Logical Operator: .AND. (e.g. City='Delhi' .AND. Pin)

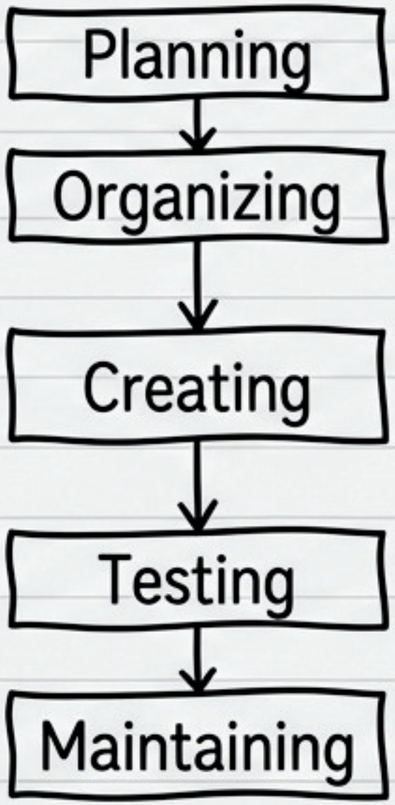
```
LOCATE for name="Veena"
INDEX ON GRADE TAG ASS OF ASS2

@8,12 SAY "CODE :"+str(M.CODE)
@15,12 SAY "DATE OF BIRTH :" GET M.D_O_B
READ MENU TO CH3
CLEAR READ (To exit)
```

Commands specific to FoxPro environment.

Internet & Web Technology (HTML)

- Web Browser: Retrieves HTML (Chrome, Firefox).
- Web Server: Stores content.
- HTML: HyperText Markup Language. Uses Tags and Attributes.

Document Life Cycle



Site Structures:

- Hierarchical, Linear, Webbed.

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  </tr>
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Exam Review: Important Questions

Important

Short Answers (2 Marks)

- What is a microcomputer?
- What is a physical address?
- What is a file system?
- What is a web browser? Give example.

Descriptive (6-8 Marks)

- State and prove De Morgan's Law.
- Difference between Impact and Non-impact printers.
- Explain DDL Commands with examples.
- Discuss Unix system structure with diagram.
- Explain briefly about DNS.

Good Luck with the Semester Exam!

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