Software Programming

1️⃣ Introduction

Software programming is the process of designing, writing, testing, and maintaining instructions (called programs) that a computer can execute to perform specific tasks. These instructions are written in programming languages that act as a bridge between humans and machines.

In simple words, programming tells the computer **what to do and how to do it**.

2️⃣ Programming Languages

Programming languages are classified into different types:

🔹 Low-Level Languages

- Machine language (binary code)
- Assembly language
- Directly understood by computer hardware
- Fast but difficult for humans

🔹 High-Level Languages

- Easy to read and write
- Closer to human language
- Examples:
    - C
    - C++
    - Python
    - Java

These languages require a **compiler or interpreter** to convert them into machine code.

3️⃣ Steps in Software Programming

1. Problem identification
2. Algorithm design

3. Flowchart preparation
4. Coding
5. Compilation
6. Testing and debugging
7. Maintenance

4️⃣ Important Concepts

- Variables and Data Types
- Operators
- Conditional Statements (if-else, switch)
- Loops (for, while, do-while)
- Functions
- Arrays
- Object-Oriented Programming (OOP) concepts like classes and objects

---

5️⃣ Applications of Software Programming

- Web development
- Mobile app development
- Embedded systems
- Artificial Intelligence
- Game development
- Automation and IoT systems