

# Assignment 1

**Name :** Virina Fady Magdy

## 1) Difference between Framework and Library

### **Library:**

- You call and use it whenever you need.
- You stay in control of the program flow.
- It provides specific functions or tools.
- Examples: **jQuery, React, Lodash**

### **Framework:**

- The framework controls how your code should be structured.
  - It calls your code (Inversion of Control).
  - It gives you a complete structure to build an application.
  - Examples: **Angular, Django, Laravel**
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## 2) Difference between Compiler and Preprocessor

### **Preprocessor:**

- Runs before the compiler.
- Performs simple text-based operations like:
  - Removing comments
  - Expanding macros
  - Including files (#include)
- Example: **C Preprocessor**

### **Compiler:**

- Runs after the preprocessor.
  - Checks the code for errors (syntax/semantic).
  - Translates the code into:
    - Machine code
    - Bytecode
    - Or another executable form
  - Also performs optimization.
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### 3) Difference between TypeScript and JavaScript

#### JavaScript:

- A dynamic programming language.
- Does not require type declarations.
- Directly executed by browsers.
- Example:
- `let x = 5;`
- `x = "hello"; // Valid`

#### TypeScript:

- A superset of JavaScript.
- Adds static typing, interfaces, and better tooling.
- Needs to be compiled into JavaScript before running.