CHAPTER 01:

Software consists of programs, which are a set of instructions.

**System software:** It is a software designed to provide a platform to another software.

(e.g., Operating systems, compilers, interpreters and assemblers)

**Compilers vs. Interpreters:**

c. Only convert a high-level language after removing all the syntax errors.

i. Translate one statement at a time, and execute it right after.

c. Fast.

i. Slow.

**Software development process:**

1. Analyze
2. Design
3. Code
4. Implement
5. Test and debug

1 – Without a clear understanding of the problem, there is no way the team is going to solve it. In this step of the process, the team is obligated to rise specifications.

1.1. Input?

1.2. Values?

1.3. Domain (range of values)

1.4. There will be interaction with the user? Is it going to enter data?

1.5. What remains constant?

2 – Several methods are used at this phase. For example:

2.1. The Divide-and-conquer(top-down design) approach, which consists of breaking the problem from the overview perspective into small subtasks until it is so simple, you can solve right away.

2.2. Object-oriented approach, which consists of determining entities that represent data and behaviors.

2.3. The algorithm is a straightforward step-by-step process for solving a problem.

3 – Chose a high-level programming language and write the source code.

4 – Compile the code. (Flow for C# program compilation)

4.1. Source code.

4.2. Compile.

4.3. Generates the **MSIL** (**M**icrosoft **I**ntermediate **L**anguage).

4.4. **CLR** (.NET **C**ommon **L**anguage **R**untime) use the **JIT compiler** (**J**ust-**I**n-**T**ime) with the loader.

4.5. Readable machine code.

5 – Use of **TDD** (**T**est **D**riven **D**evelopment) and/or **BDD** (**B**ehavior **D**riven **D**evelopment).

**Structured Procedural Programming:**

* Process-oriented.
* Follow the five steps of SOFTWARE DEVELOPMENT PROCESS.
* Tools such as flowchart and pseudocode.
* Top-down design.
* High cost with maintenance.

**Object-Oriented Programming:**

* Define entities with attributes (data) and (methods) behaviours.
* Objects and classes.
* **UML** (**U**nified **M**odeling **L**anguage) is used as a tool.
* Inheritance.
* Polymorphism.

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