**Investigation about “Stage of Program Compilation” and “Levels of Programming”**

We need automate task, and for that we can use machines, but we need a language to communicate with them, that’s the binary code, but it is difficult to us understand it, is for that we need a intermediate language between our language and the binary code, that is a programming language, and to pass from it to a binary code is necessary a compilator. That is, we will be going to talk.

A compilation is a process of translation from programming language to binary code, this process is divided in four steps or stages: Pre-processor, Compiler, Assembler and Linker.

1. Pre-processor: The written program in one programming language is passed to the pre-processor and executed, then it passes to the compiler for the next step.
2. Compiler: The compiler converts this program into assembly program, this is called “Compilation”, the program now is a set of specific assembly commands for the target processor commands.
3. Assembler: It converts assembly program into an object program, which is in binary code.
4. Linker: Normally, a written code in any program language uses at least one library, and the linker put the objective program with the specific part of the library that is needed by the program.

But there are several programming languages, and all of them are different. They can be classified by how they are “near” to the binary code in “levels”.

Mainly, there are 3 levels of programming languages: high-level, assembly, and machine.

1. High-level: They are the closest to the human languages. They have a syntaxis that is easy to understand, that is why is preferred for beginners. They are used in several areas, from games, apps to machine learning, etc. Some high-level languages are Python, Java, C#.
2. Assembly Language: Use mnemonics and abbreviations to express the binary code but simpler. Assembly language is used for specific hardware. The advantage of use it is that it can work directly on memory location and that makes it faster.
3. Machine Language: Is the language that the computers use and understand, is the lowest of the levels of programming language. It is a set of ceros and ones, in other words, is binary code. This is why Machine language is especially difficult to learn, because is hard to understand a set of ceros and ones in a single page.

**References:**

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