جامـــــعة المـــــستـقبـل
AL MUSTAQBAL UNIVERSITY

كلية العلـوم

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المحاضرة الأولى

المادة: أساسيات لغة CPP
المرحلة: الأولى
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Introduction to Programming and C++ Fundamentals

Computer Concept: A computer is an electronic device capable of performing calculations and making logical decisions at speeds millions, and even billions, of times faster than human beings.

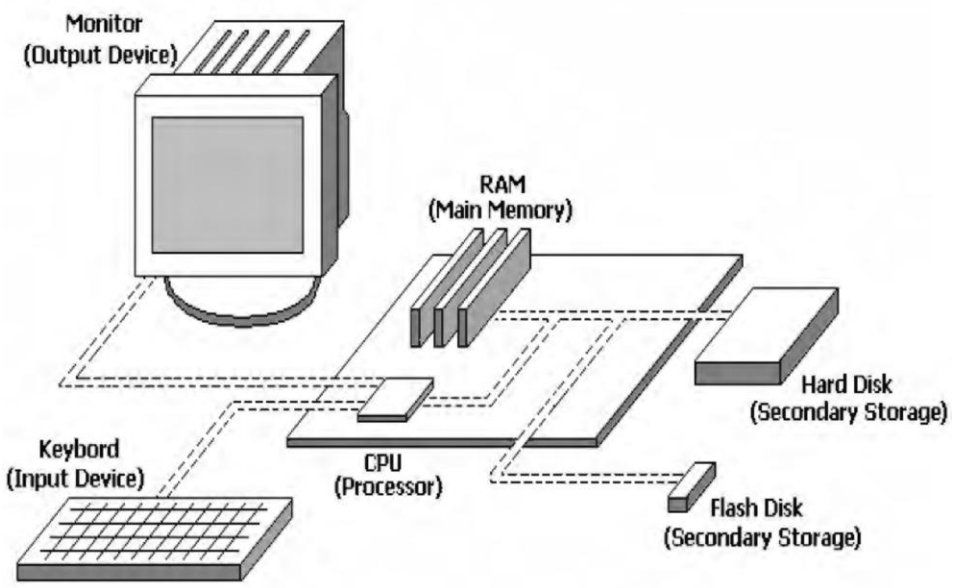


Figure 1. Hardware Components

- Computers process data under the control of organized sets of instructions known as **computer programs**.

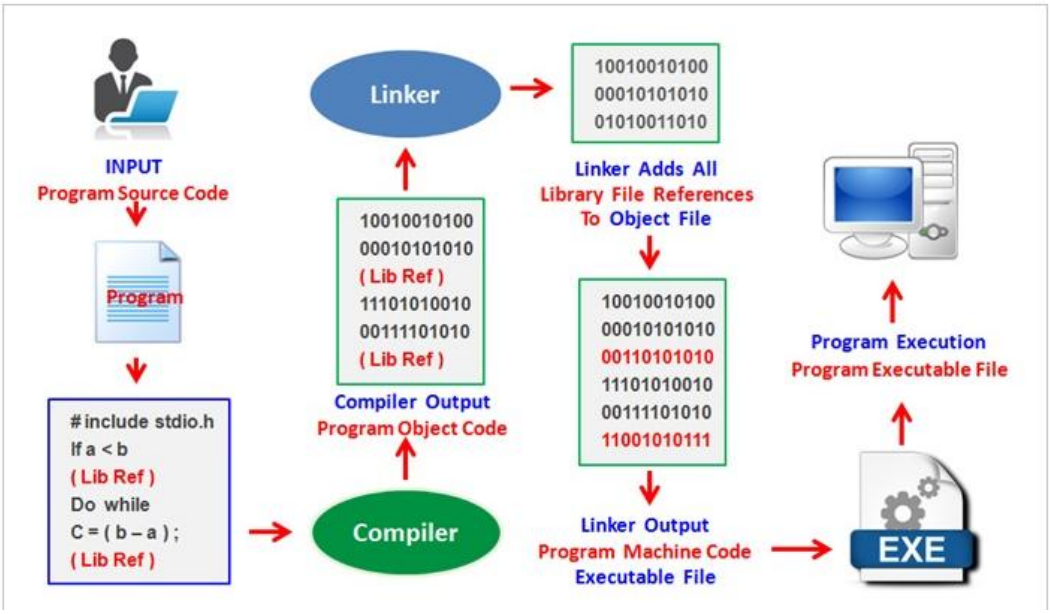


Figure 2. Machine Instruction in Computer Architecture

Programming Concept: Programming means giving a computer clear instructions, step by step, to help it solve a problem.

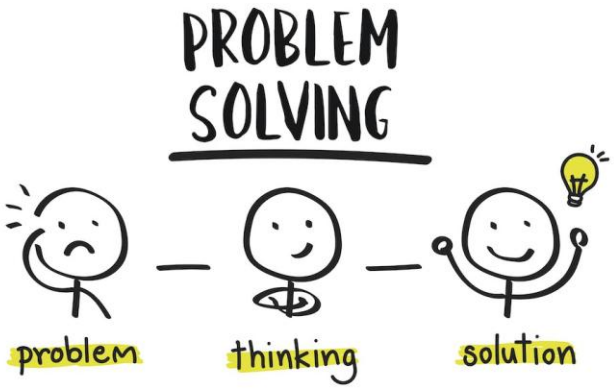


Figure 3. Why developing?

- Programs that run on a computer are called software, while the physical parts of the computer are called hardware.

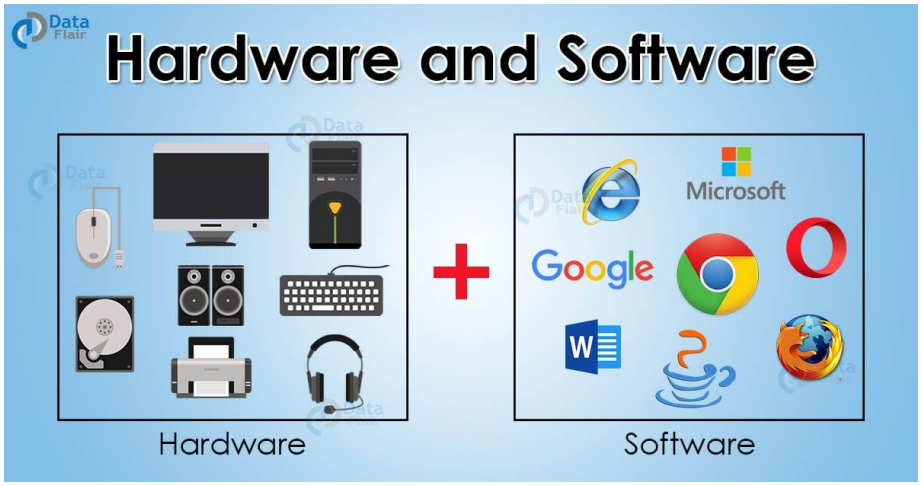


Figure 4. Hardware and Software

- To create new software, programmers write organized instructions that the computer can follow .
- However, programmers usually do not write these instructions in the computer's own language.

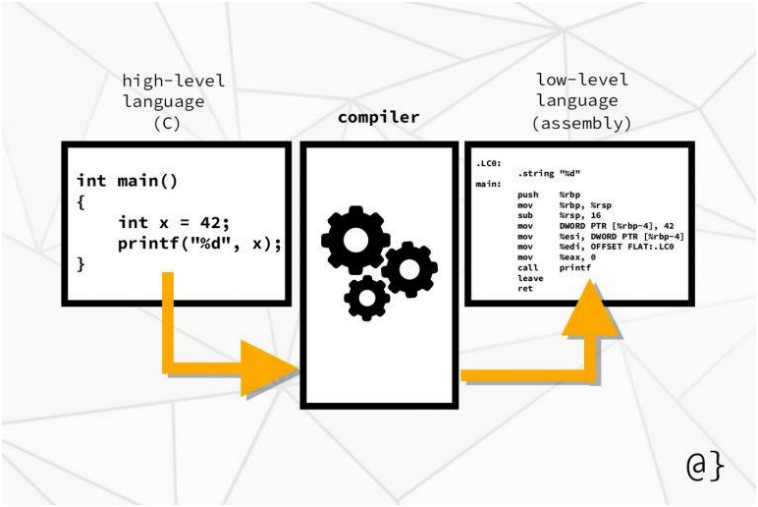


Figure 5. Compiler

Short History of Programming Languages

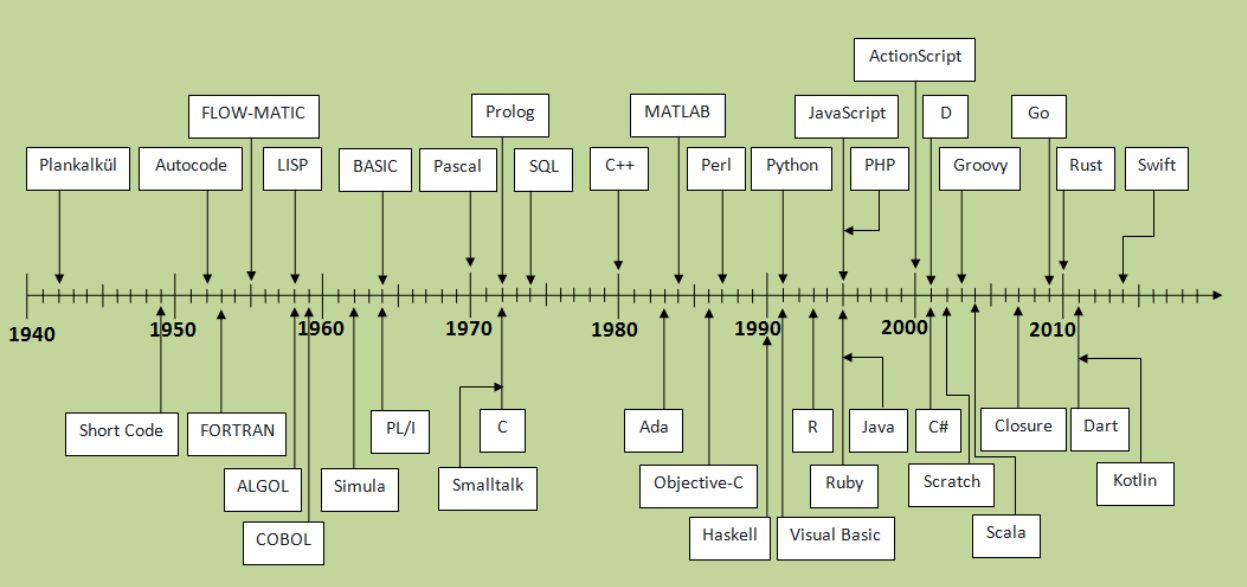


Figure 6. History of Programming Languages

CPP Language:

C++ is a powerful programming language used to build fast and efficient software. It supports object-oriented programming and is widely used in system, game, and application development.

Bjarne Stroustrup is the creator of the C++ programming language.

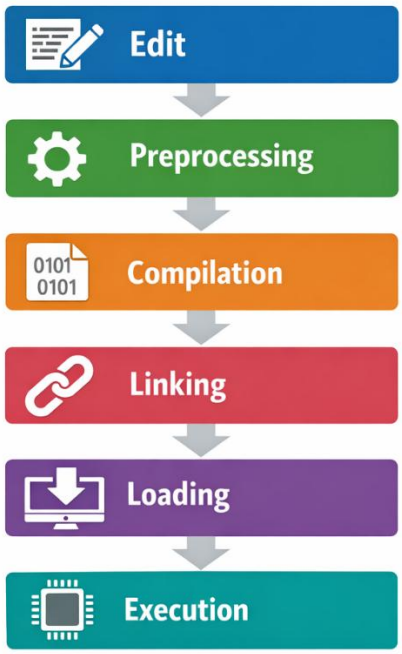
Figure 7. Bjarne Stroustrup.

- For the last few decades, the C programming language has been widely accepted for many applications and is considered one of the most powerful structured programming languages.
  C++ extends the C language by combining structured programming with object-oriented programming (OOP).
- C++ has become very popular for the following reasons:
- It supports the features of both structured programming and object-oriented programming.
- C++ provides powerful mechanisms such as functions, classes, and templates for handling different data types efficiently.

C++ Program Development Process (PDP):

- C++ programs typically go through six main phases before they can be executed. These phases are:

1. Edit: The programmer writes the C++ source code and corrects any errors if necessary.
The source file is saved on disk with the extension (.cpp).
2. Preprocessing: The preprocessor performs operations before compilation, such as including header files and macro substitutions.
3. Compilation: The compiler translates the source program into object code.
4. Linking: The linker combines the object code with required library functions to produce an executable file.
5. Loading: The loader loads the executable program from the disk into the main memory.
6. Execution (CPU): The CPU executes the program while it resides in memory.
These steps are usually illustrated using a simple program development flow diagram.


Edit
Preprocessing
0101
0101
Compilation
Linking
Loading
Execution