

Introduction of C++ Programming Language

ENG. LAMYAA GABER ALI

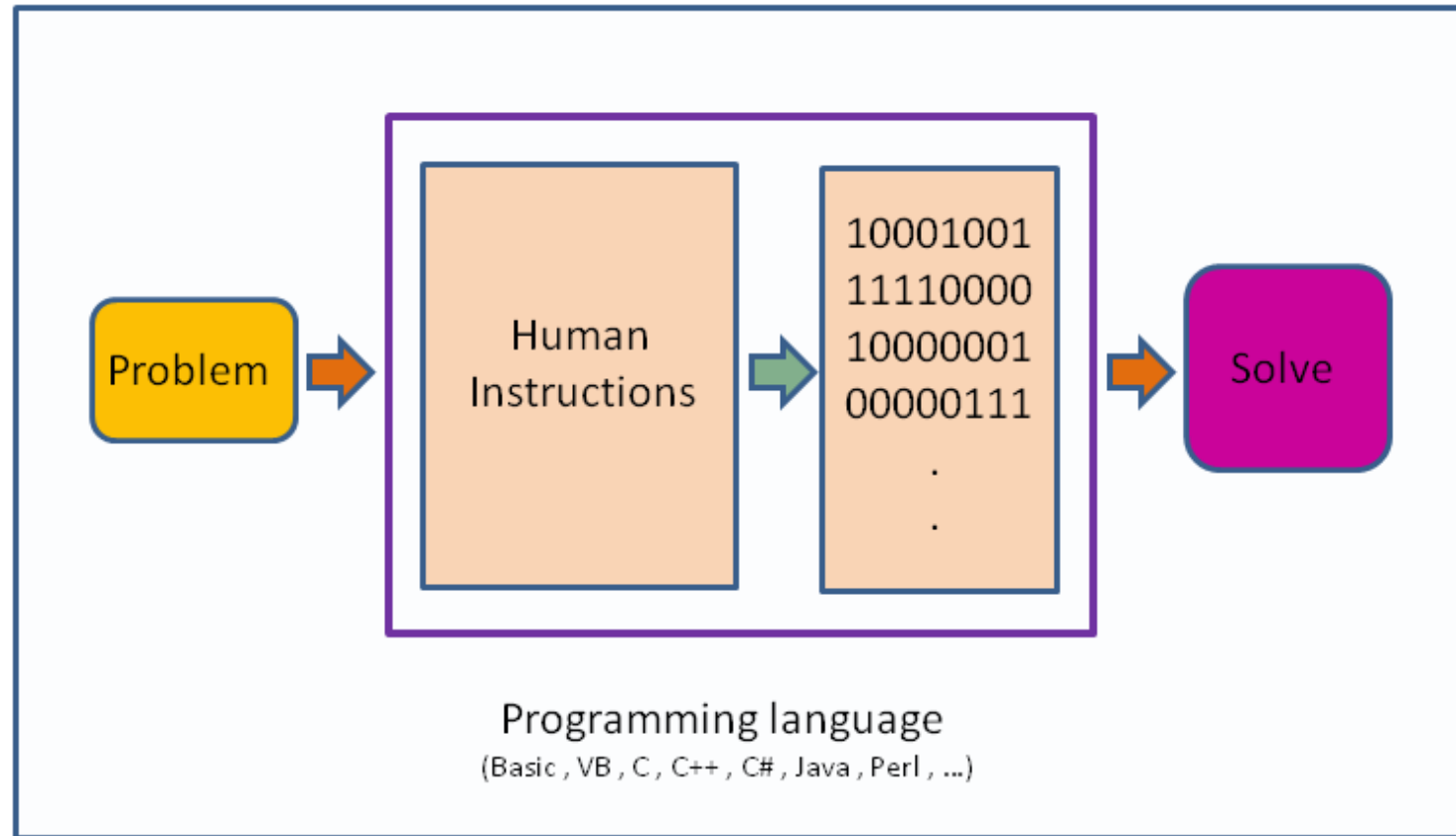
Contents

- What is a programming language?
- Why are there so many programming languages?
- What are the main types of programming languages?
- Why do we choose C++ programming language?
- What are the main parts of any C++ program?

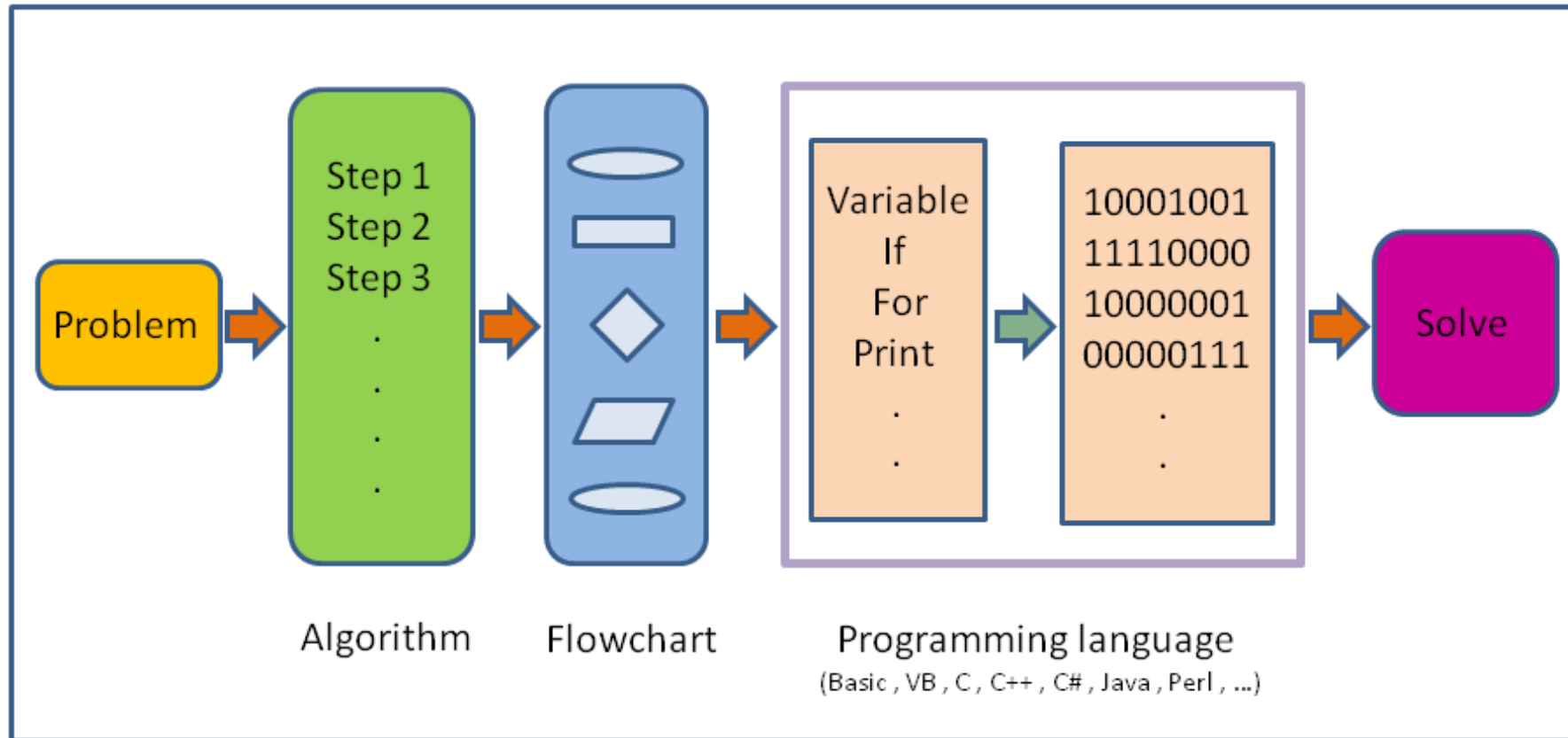
What is a programming language?

- A programming language is a set of rules that
 - provides a way of telling a computer what operations to perform.
 - uses for communicating an algorithm.
 - provides a linguistic framework for describing computations.

What is a programming language?



What is a programming language?



What is a programming language?

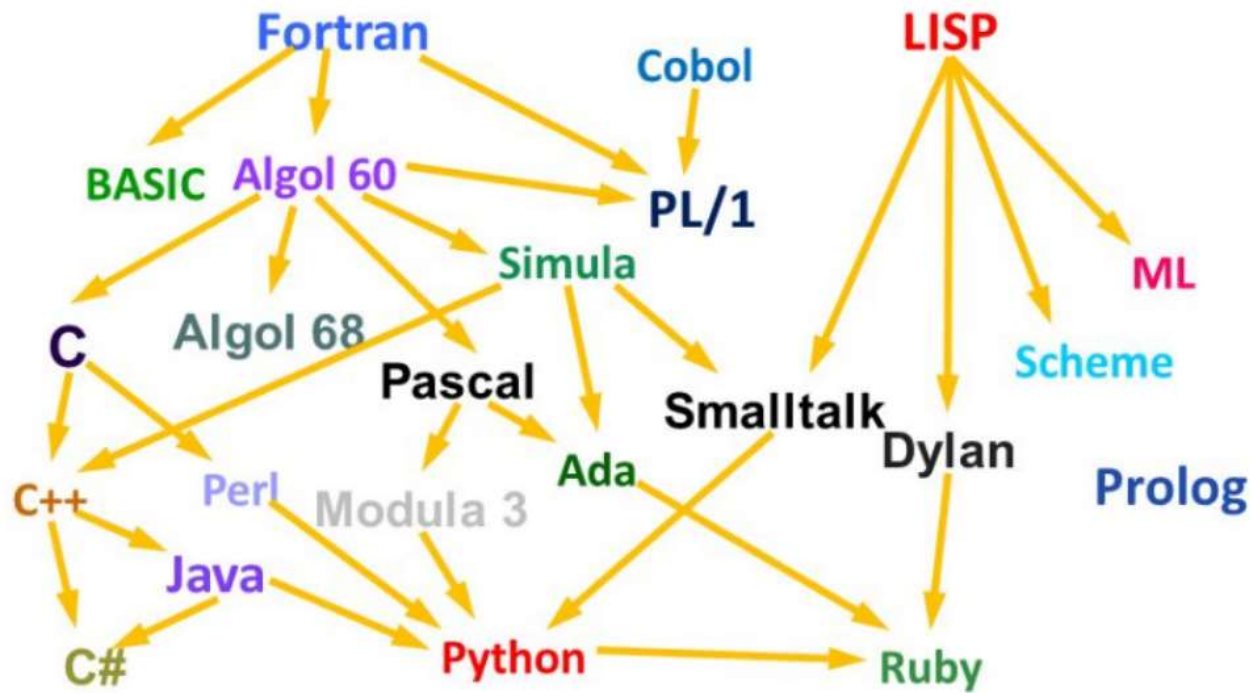
- English is a natural language. It has words, symbols and grammatical rules as we know.
- A programming language also has words, symbols and rules of grammar
- These grammatical rules are called “Syntax”.
- Each programming language has a different set of syntax rules

For instance, every line in a C++ program must end with a semicolon (;).

```
int x;
```

```
int y      // syntax error
```

Why are there so many programming languages?



Why are there so many programming languages?

- Why does some people speak French?
- Different Programming languages are created to solve different types of problems. For example,
 - Python created to easy to learn and easy to write language (can be used in many different problems e.g. robotics, gamming, web apps ...)
 - Java allows you to write apps that can run everywhere (windows, MAC ...)
 - JavaScript allows you to create web browsers
 - PHP (Personal homepage) designed to create web apps (Facebook).
 - ...

Why are there so many programming languages?

- A lot of languages are flexible and can overlap but people invent new language because they prefer coding with a certain way (easy to read, easy to encapsulate, faster etc..).
- So the main reasons of this question are:
 - Solving different types of problems.
 - because of the difference between the programmer's tastes.
 - because of the advances in computer hardware (faster, more powerful)

Types of Programming Languages

Computer Languages

```
graph TD; A[Computer Languages] --> B[Low Level Language  
( Machine Language )]; A --> C[Middle Level Language  
( Assembly Language )]; A --> D[High Level Language]; B --> B1[Use 1' s & 0' s to  
create instructions]; B --> B2[Ex: Binary Language]; C --> C1[Use mnemonics to  
create instructions]; C --> C2[Assembly Language]; D --> D1[Similar to  
human language]; D --> D2[COBOL, FORTRAN, BASIC  
C, C++, JAVA];
```

Low Level Language (Machine Language)

Use 1' s & 0' s to
create instructions

Ex: Binary Language

Middle Level Language (Assembly Language)

Use mnemonics to
create instructions

Assembly Language

High Level Language

Similar to
human language

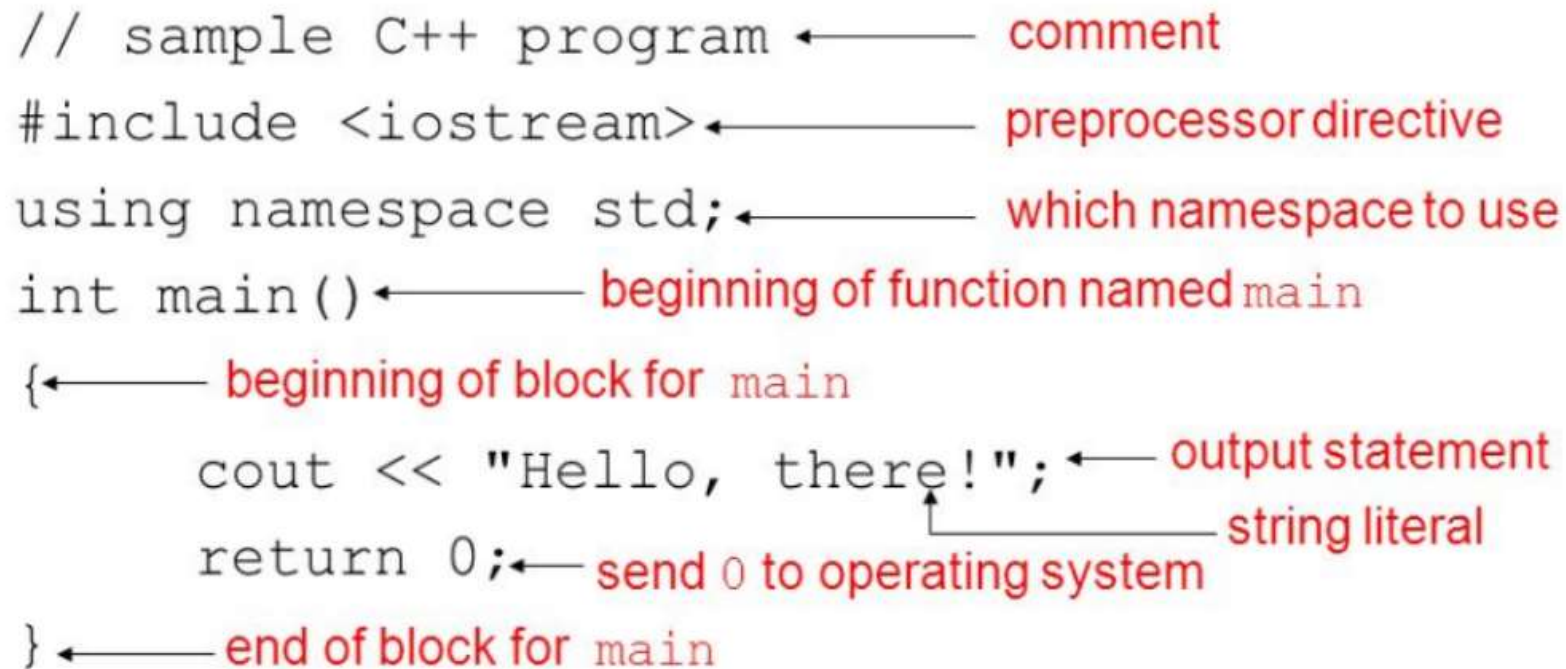
COBOL, FORTRAN, BASIC
C, C++, JAVA

C++ Programming Language

- It is an extension of the C language.
- Initially, C++ language was called "C with classes" as it had all the properties of the C language with an additional concept of "classes."
- Advantages:
 - C++ has a rich function library.
 - C++ is a powerful, efficient and fast language.
 - C++ allows exception handling, and function overloading which are not possible in C.
 - C++ is an object-oriented programming language and includes classes

Main parts of a C++ program

```
// sample C++ program ← comment
#include <iostream> ← preprocessor directive
using namespace std; ← which namespace to use
int main() ← beginning of function named main
{ ← beginning of block for main
    cout << "Hello, there!"; ← output statement
    return 0; ← send 0 to operating system
} ← end of block for main
```

A diagram illustrating the main parts of a C++ program. The code is shown in a monospaced font. Red text annotations with arrows point to specific parts of the code: 'comment' points to the first line, 'preprocessor directive' points to the second line, 'which namespace to use' points to the third line, 'beginning of function named main' points to the fourth line, 'beginning of block for main' points to the opening curly brace, 'output statement' points to the cout statement, 'string literal' points to the string "Hello, there!", 'send 0 to operating system' points to the return statement, and 'end of block for main' points to the closing curly brace.