Programming In C

Tutorial 01

30499

01) We can define a programming language as a set of rules and symbols used to construct a computer program. Furthermore, programming languages are mainly used to develop operating systems, mobile and desktop applications…etc.

When it comes to the need of a programming language, nowadays programming languages are necessary because they allow users to translate their thoughts in to instructions that computers can understand.

Here are some mainly used programming languages :

. Java

. C

. C++

. C#

. Python

02) a) Source code VS Machine code

Source code is written by a programmer using a high-level language. Machine codes in a programming language represent the instructions in a machine.

- Source code
  . Source code is human readable because it's in a high-level language.
  . Source code helps programmer to understand the code.
  . This has a one-to-one correspondence.
  . Source codes can compile and assemble into object code.

- Machine code
  . Machine code is not human readable because it's in binary form.
  . Machine code also has a one-to-one correspondence.

b) High Level Language VS Low Level Language

- High Level Language
  . This is a programmer friendly language.
  . High level languages are so close to Human language.
  . High level languages are defined as machine independent languages.
  . This is less memory efficient
  . High level languages are easier to write, maintain, port and debug.

- Low Level Language
  . This is a machine friendly language.
  . Low level languages are so close to machine language.
  . Low level languages are considered as machine dependent languages.
  . Low level languages are high memory efficient.
  . These are harder to write, maintain, port and debug.

c) Compiler VS Interpreter

- Compiler
  . Compilers scan the entire program at once.
  . Compilers caught syntax errors before running the program.
  . Compilers take large amount of time to analyze the source code of the program.
  . Moreover, the execution time is faster than Interpreters.

- Interpreter
  . Interpreters scan the program one statement at a time (line by line).
  . Usually, Interpreters take less amount of time to analyze the source code of the program.

. This has more flexibility.
. The execution time of interpreters are less than compilers.

d) Structured Language VS Object Oriented Language.

- Structured Language
  . Structured Languages follow a top-down approach.
  . Structured languages are easy to read.
  . In addition, structured languages are simple, more efficient and faster languages.
  . But they don't have ability to handle complex problems.
  . Structured languages are used for simple programming.

- Object Oriented language
  . Object Oriented languages follows a bottom-up approach.
  . They are flexible and secure.
  . Object Oriented languages are harder to learn and debug.
  . Furthermore, Object Oriented languages are more realistic, extensible and modular.
  . Object oriented languages are used for complex and dynamic programming.

e) C VS C++

- C Language
  . C programming Language is a Low-level language.
  . This is an efficient, fast and portable language.
  . C programming language is mostly used for system programming.
  . But c programming language doesn't have the ability to handle complex problems.

- C++ Language
  . C++ Language is an object-oriented mid-level language.
  . This is extensible, flexible and secure.

. C++ is difficult to learn when compared to the C programming language.
. C++ language is mostly used for application programming.

f) C++ VS Java

- C++ Language
  . C++ is a mid-level language.
  . Moreover, C++ is an object-oriented language.
  . This is used for application programming.
  . C++ is difficult to learn when compared to Java programming language.
  . This language is extensible, flexible and secure.
  . C++ supports many features. Such as, templates, pointers, multiple inheritance.

- Java Language
  . Java is a High-level language.
  . In addition. Java is an object-oriented language and a platform dependent language.
  . This is a portable and secure language.
  . Java programming language is used for application programming.

g) Syntax Error VS Logical Error

- Syntax Error
  . Syntax error occurs when there's a grammar mistake in the program.
  . Moreover, Syntax errors prevent the program from executing and compiling.

- Logical Error
  . Logical Error occurs when the program completes the execution but delivers incorrect results.

. This logical error doesn’t prevent the program from executing and compiling.
. Furthermore, Logical errors cause program to behave incorrectly.