Introduction to C Language

A computer system is an electronic device which understands either the presence of electric current or the absence of electric current which is designated as '1' and '0'. The concept of 1s and 0s is also known bits in a binary number system. In other words it can be said that a computer system is an electronic device which can only understand the binary language which is in the forms of 1s and 0s. This binary language is also known as machine language.

The machine language understandable by a computer is not easily understood by a human being. Second the process of understanding a mammoth size of 1s and 0s humans may take years all along to decode a large chunk of message. The scientific community across the globe worked on this aspect in order to develop a language which will easily understood by humans and which can be translated into the machine code easily in order to process the same using a computer system. The result of this activity helped the scientific community to develop a programming language which can be written by humans and the same can be executed by a computer. The development of programming languages revolutionized the application of computers as more and more programs were written to automate different processes using computers. The different programming languages that were developed are given below:

Symbolic/Assembly Language:

A low-level programming language using abbreviations or mnemonic codes in which each statement corresponds to a single machine instruction. An assembly language is translated to machine language by the assembler and is specific to a given processor. Advantages of using an assembly language include increased execution speed and direct programmer interaction with system hardware. However, the assembly language or low level language was difficult to use as the number of mnemonic codes was limited which did not give flexibility to developers to apply computers in different walks of life. The low level language was treated as a machine friendly language.

High-level Language:

A high-level programming language is a programming language that is user-friendly for a developer which has resulted in development of software applications across for almost all walks of life. The developer writes a program which is sequence of instructions that a computer has to execute in an easily understandable fashion and the same is translated in the form of machine code which can be executed by a computer. Some of the high-level-languages are listed below:

1) FORTRAN
2) COMTRAN
3) LISP
4) ALGOL
5) COBOL
6) BASIC
7) PASCAL
9) Prolog
10) C++
11) Ada
12) MATLAB
13) Python
14) Visual Basic
15) JAVA

8) C language 16) PHP

In this class out focus will be too explore how to write a program in C language and accordingly we will try to get an insight into different attributes of C language in an effort to learn the programming language.

A program is a sequence of steps that are treated as instructions by a computer which in turn executes the sequence in the same order as mentioned in the program. Informally, a program is any well-defined computational procedure that takes some value, or set of values, as input and produces some value, or set of values, as output. A computer program is thus a sequence of computational steps that transform the input into the output. We can also view a program as a tool for solving a well specified computational problem. The statement of the problem specifies in general terms the desired input/ output relationship. The algorithm describes a specific computational procedure for achieving that input/output relationship.
For example, if we need to find out sum of two numbers, then the process for the same will be:

Step 1: Start
Step 2: Read two values
Step 3: Add the two values
Step 4: Display the result
Step 5: Stop

A computer program is said to be correct if, for every input instance, it halts with the correct output. We say that a correct computer program solves the given computational problem. An incorrect computer program might not halt at all on some input instances, or it might halt with an answer other than the desired one.
A computer program must have at least the following characteristics in order to be called as a computer program.

- Systematic Sequence: A computer program must follow a systematic sequence where step 1 will be required to be processed first and on completion of step-1 any other proceeding steps will be executed.
- Single Entry and Single Exit: A computer program should have a single entry point so that all the pre-requisites are invoked which are required for execution of a computer program. Similarly on completion of a task a computer program should have a single exit point which will ensure that all invoked methods are revoked on completion of a task.
- Finite: A computer program should not keep on running infinite number of times as it may lead to a situation where the computer will get stuck due to infinite execution of a computer program.
- Desired Objective: A computer program should be able to achieve the desired objective. In case a computer program is written for adding two numbers then the computer program must be able to add two numbers and the result should be correct.