C Language

❖ **Introduction to Programming Language:**

Language is mainly used for communication between two or more persons. Same way in computer technology if we want to communicate with the system or we want to do some work in computer then we have to give some commands or instructions to the system. For giving any instruction or command to computer we required a special language & that is the computer language such as C, C++, Pascal etc. Here general use of programming language is to solve any particular problem with help of language.

C is a programming language which born at ***"AT & T's Bell Laboratories"*** of USA in ***1972***. It was written by ***Dennis Ritchie***. This language was created for a specific purpose: to design the UNIX operating system. ***American National Standards Institute (ANSI)*** formed a committee in 1983 to establish a standard definition of C. This committee approved a version of C in 1989 which is known as ANSI C.

❖ **Importance of C :**

Now a day, there are many high level languages like Pascal, Basic, & Java. But C is a robust language whose rich set of built in functions & operators can be used to write any complex logic program. The C language compiler combines the capabilities of a low level language with the features of high level language. Therefore the language is suitable for writing both system software as well as business packages & other software.

1. Program written in C are very efficient & fast for the programmer & developer. This is due to its variety of data types & powerful operators. It is many time faster than other languages. This helps developers in saving their valuable time.
2. C is powerful & flexible language which helps system developers & programmers to deliver various complex tasks with ease. C is used for diverse project as operating systems, word processors, graphics, spreadsheets & even compilers for other languages.
3. C is popular among professional programmers for programming, as a result wide variety of C compilers & helpful accessories are available.
4. There are only 32 keywords; several standard functions are available which can be used for developing program.
5. C is highly portable language. This means that a C program written for one computer system can be run on another system with little or no modification. Portability is enhanced by the ANSI standard for C, the set of rules for C compilers.
6. Another feature is its ability to extend itself. A C program is basically a collection of various built-in functions supported by C library. We can also add our own functions to the C library. These functions can be reused in other applications or programs by passing pieces of information to the functions, you can create useful, reusable code.
7. Writing program with user-defined functions makes program more simple & easy to understand. Breaking a problem in terms of functions makes program debugging, maintenance & testing easier.

❖ **High Level Language :**

It is a programming language that is more user friendly to some extent platform independent & abstract from low level computer processor operations such as memory accesses.

❖ **Low Level Language :**

It is a programming language that is more machine specific & from computer processor operations such as memory accesses is directly dependent.

❖ **C – Middle Level Language :**

C is often called a middle level computer language as it combines the elements of high-level languages with the functionalism of assembly language.

C gives or behaves as High Level Language through Functions- gives a modular programming & breakup; increased efficiency for reusability, C gives access to the low level memory through pointers. Moreover it does support the Low Level programming i.e. Assembly Language.

C language is middle level language because:

1. C language behaves as High Level Language through functions – gives a modular programming & breakup, increased efficiency for reusability.
2. C language gives access to the low level memory through Pointers. Moreover it does support the Low Level programming i.e. Assembly Language.
3. As C Language a combination of these two aspects, it's neither a High Level now a Low level language but a Middle Level Language.

❖ **Introduction of C Editor**

An editor is a one type of software tools in which user can type the text, modifying deleting and formatting an existing text. To type your C program you need another program called editor. Once the program has been typed it needs to be converted to machine language (0s and 1s) before the machine can execute it. To carry out this conversion we need another program called Compiler.

For example: Notepad, Wordpad, C editor Turbo C, Turbo C++, Dos Editor, JAVA, FoxPro etc. For writing a C program, generally we are using TC (Turbo Compiler) editor and executing a C program.

Here, some of the important shortcut keys are listed below for working with TC.

No.	Shortcut	Use
1	F2	Save Program file (Save C program with C extension)
2	F3	Open an existing save program file.
3	F5	To maximize editor area.
4	Alt + Back Space	Undo last changes in editor.
5	Shift + Alt + Back Space	Redo last changes by Undo.
6	Ctrl + Insert key	Copy selected Text from Editor.
7	Shift + Del	Cut selected Text from Editor.
8	Shift + Insert key	Paste Copied or Cut text.
9	Ctrl + Del	Clear selected Text.
10	Alt + F9	Compile C Program.
11	Ctrl + F9	Run C Program.
12	F7 or F8	Step by Step debugging.

Now assuming that, you are using a Turbo C or Turbo C++ compiler here are the steps that you need to follow to compile and execute your first C program...

(a) Start the compiler at **C>** prompt. The compiler (TC.EXE is usually present in **C:\TC\BIN** directory)
(b) Select **New** from the **File** menu.
(c) Type the program.
(d) Save the program using **F2** under a proper name (say program 1.c).
(e) Use **Ctrl + F9** to compile and execute the program.
(f) Use **Alt + F5** to view the output.

Now, that on compiling the program its machine language equivalent is stored as an EXE file (Program1.EXE) on the disk. This file is called an executable file. If we copy this file to another

machine we can execute it there without being required to recompile it. In fact the other machine need not even have a compiler to be able to execute the file.

A word of caution! If you run this program in Turbo C++ compiler, you may get an error – "The function printf should have a prototype". To get rid of this error, perform the following steps and then recompile the program.

(a) Select 'Options' menu and then select 'Compiler' |C++ Options. In the dialog box that pops up, select 'CPP always in the 'Use C++ Compiler' options.
(b) Again select 'Options' menu and then select 'Environment | Editor'. Make sure that the default extension is 'C' rather than 'CPP'.