INTRODUCTION OF C

Features of C Programming Language:

1. Procedural Language
2. Fast and Efficient
3. Modularity
4. Statically Type
5. General-Purpose Language
6. Rich set of built-in Operators
7. Libraries with rich Functions
8. Middle-Level Language
9. Portability
10. Easy to Extend

1. Procedural Language: In a procedural language like C step by step predefined instructions are carried out. C program may contain more than one function to perform a particular task. New people to programming will think that this is the only way a particular programming language works. There are other programming paradigms as well in the programming world. Most of the commonly used paradigm is an object-oriented programming language.

2. Fast and Efficient: Newer languages like java, python offer more features than c programming language but due to additional processing in these languages, their performance rate gets down effectively. C programming language as the been middle-level language provides programmers access to direct manipulation with the computer hardware but higher-level languages do not allow this. That's one of the reasons C language is considered the first choice to start learning programming languages. It's fast because statically typed languages are faster than dynamically typed languages.

3. Modularity: The concept of storing C programming language code in the form of libraries for further future uses is known as modularity. This programming language van does very little on its own most of its power is held by its libraries. C language has its own library to solve common problems like in this we can use a particular function by using a header file stored in its library.

4. Statically Type: C programming language is a statically typed language. Meaning the type of variable is checked at the time of compilation but not at run time. This means each time a programmer type a program they have to mention the type of variables used.

5. General Purpose Language: From system programming to photo editing software, the C programming language is used in various applications. Some of the common applications where it's used are as follows:

6. Operating systems: Windows, Linux, iOS, Android, OXS

7. Databases: PostgreSQL, Oracle, MySQL, MS SQL Server etc.

8. Rich set of built-in Operators: It is a diversified language with a rich set of built-in operators which are used in writing complex or simplified C programs.

9. Libraries with rich Functions: Robust libraries and functions in C help even a beginner coder to code with ease.

10. Middle-Level Language: As it is a middle-level language so it has the combined form of both capabilities of assembly language and features of the high-level language.

11. Portability: C language is lavishly portable as programs that are written in C language can run and compile on any system with either none or small changes.

12. Easy to Extend: Programs written in C language can be extended means when a program is already written in it then some more features and operations can be added to it.

C Header Files:

Humans and computers communicate using input/output devices.
Programming languages facilitate such communication through I/O operations like reading input from the keyboard, displaying output on screens, writing to files, printers, etc.
C language provides many functions to perform, read, and write operations for the I/O devices. These functions are made available in files (usually written with .h extension) referred to, as header files.
Standard I/O library functions are available in a file named stdio.h (standard input output header file).
C language provides a collection of such header files which form the C standard library. These files are usually available in operating systems like Linux by default.
Programmers can also create their own header files which are usually referred to as user-defined header files.
As mentioned earlier, there is a file called stdio.h among the header files present in C standard library, which contains the most commonly used functions to print data to console and to read (also called scan) data.
In order to use the functions available in the header file stdio.h, the following line has to be used in a program:
#include:
The header files are included in a program using the #include directive.
The header files can be included using #include in two ways as follows:

1. #include <header_file_name.h>: This variant is used to include system header files made available in C standard library. The compiler searches for the named file in the standard list of system directories.
2. #include “header_file_name.h”: This variant is commonly used to include user-defined header files. The compiler searches for the named files only in the local or project-specific paths.
3. Here, the symbol # is called the preprocessor directive, include is called the command, and stdio.h is the header file.
4. Note: Some compilers automatically include stdio.h. While using compilers that do not automatically include stdio.h, programmers have to explicitly write the include statement in their programs to avoid compilation errors.

   #define:

   In programming terminology, a macro is a pattern or a rule which specifies how a certain sequence of text should be replaced.
   Given below is the most commonly included header file which contains the standard input/output functions like, printf(), scanf(), etc.
   C allows us to define two types of macros using the preprocessor directive #define as shown below:

1. #define PI 3.14
2. #define MIN(a, b) ((a) < (b)? (a) : (b))

   The first type of substitution has been discussed while learning about symbolic constant.
   The second type can be used to define a rule or a function that works on given arguments.

Input /Output

When we say Input, it means to feed some data into a program. An input can be given in the form of a file or from the command line. C programming provides a set of built-in functions to read the given input and feed it to the program as per requirement.

When we say Output, it means to display some data on screen, printer, or in any file. C programming provides a set of built-in functions to output the data on the computer screen as well as to save it in text or binary files.

The Standard Files

C programming treats all the devices as files. So devices such as the display are addressed in the same way as files and the following three files are automatically opened when a program executes to provide access to the keyboard and screen.