

Introduction To C Programming:

Computer is an electronic device that takes input, process it and gives output. There is nothing like 0 and 1 in computer system. There is no physical significance of 0 and 1. Any information can be encoded as a sequence of 0 and 1.

File is a data bundle. A file is represented like "Filename.extension". for song/audio file the extension is ".mp3", for video file the extension is ".mp4", for image file the extension is ".jpg or .png", for text file the extension is ".txt", for executable file the extension is ".exe". The executable/instruction software file for computer system are the ".exe" files.

Application software are those software which are for user purpose. MS Office, Calculator, Media Player are some of the example of Application software. System Software are those software which are for system purpose. Operating System and Device drivers are the examples of System Software.

In a computer system the set of instruction is called program. Active state of a program is called process. Program which is in execution is called process.

History Of C Programming:

In 1958 computer scientists developed a programming language called ALGOL(Algorithmic Language). ALGOL is base or father of programming language. ALGOL introduced the structure programming concept. It mainly uses the concept of sequence, decision and repetition.

Using the ALGOL programming language a new programming language was introduced called CPL(Combined Programming Language) in 1963.

Martin Richards developed a new programming language called BCPL(Basic Combined Programming Language) in 1967 which was the improved version of ALGOL and CPL. BCPL programming language was introduced for designing and developing system software.

Ken Thompson developed B language the improved version of BCPL in 1969. He is also the developer of UNIX operating system.

Dennis Ritchie Developed C programming language the improved version of B language in 1972 at AT&T's Bell LABs, USA. He was the co-developer of Unix OS. the biggest feature of the Unix OS that were proposed by him was Portable of OS which was possible only in C language.

In 1989 They publish the commercial version of C programming called ANSI C (American National Standard Institute C) which was approved by ISO(International Standard Organization) in 1990.

Integrated Development Environment(IDE):

IDE(Integrated Development Environment) is tool in which we can build a programming source code, we can debugging the source code and we can build ".exe" file of that particular source code file. In every IDE there are 3 main features are there "Code Editor", "Debugging Tools", "Build Tools".

Application Of C Programming:

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| 1. Embedded System | 5. Computer Graphics |
| 2. System Programming | 6. Space Research |
| 3. Artificial Intelligence | 7. Image Processing |
| 4. Industrial Automation | 8. Game Developing |

Uses Of C Programming:

1. C programming language can be used to design the System Software like OS.
2. C programming language can be used to design database and spreadsheet.
3. C programming language can be used to design graphical related application like computer and mobile games.
4. C programming language can be used to evaluate Mathematical equations.
5. C programming language can be used to design the compilers.
6. C programming language can be used to design device drivers.
7. C programming language can be used to design major parts of web browsers

Example Of C Programming:

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| 1. UNIX OS | 2. Oracle |
| 3. MySQL | 4. Core Libraries of Android |

Features Of C Programing:

1. Simple:

C is a simple language in the sense that it provides a structured approach (to break the problem into parts), the rich set of library functions, data types, etc.

2. Machine Independent Or Portable:

Unlike assembly language, c programs can be executed on different machines with some machine specific changes. Therefore, C is a machine independent language.

3. Mid-Level Programming Language:

Although, C is intended to do low-level programming. It is used to develop system applications such as kernel, driver, etc. It also supports the features of a high-level language. That is why it is known as mid-level language.

4. Structured Programming Language:

C is a structured programming language in the sense that we can break the program into parts using functions. So, it is easy to understand and modify. Functions also provide code reusability.

5. Rich Library:

C provides a lot of inbuilt functions that make the development fast.

6. Memory Management:

It supports the feature of dynamic memory allocation. In C language, we can free the allocated memory at any time by calling the free() function.

7. Fast Speed:

The compilation and execution time of C language is fast since there are lesser inbuilt functions and hence the lesser overhead.

8. Pointers:

C provides the feature of pointers. We can directly interact with the memory by using the pointers. We can use pointers for memory, structures, functions, array, etc.

9. Recursion:

In C, we can call the function within the function. It provides code reusability for every function. Recursion enables us to use the approach of backtracking.

10. Extensible:

C language is extensible because it can easily adopt new features.

Translator:

When two parties want to share some information between them they prefer communication to share their data or information. But for communication, both parties need a specific language. A language that contains specific symbols which make the communication happen. In humans, they communicate using different types of language to share information/data. But in technology like a computer system they use a number system to communicate to another system. From starting of the evolution of technology every technology or system uses a binary number system to communicate to another system. But binary number system is very difficult to understand by a human. So to solve this problem we added a translator to every system. A translator defines a process that converts a source language to a specific target language. When we added a translator to a system, the translator converts the binary number system to the specific target language which is understandable by human beings.

There are so many types of translators are there and it differs because of their procedure of translating process. But in a computer system we specifically use three types of translator there are as following

Compiler:

The compiler is a source code or software which performs translating process in a system and it reads a program written in one language known as source language and converts it into a specific target language. Normally the compiler reads the high-level language which is the source language and it translates into the low-level language which is low-level or machine-level language. So in the procedure of compiler, it read the whole source language at a time for translation and during the translation, it detects the error in the source language and shows the error to the user to solve it. After the conversion of the source to the target language perform the further input-output operation for process execution.

Interpreter:

An interpreter is also software that is used for translating but the procedure of the interpreter is different from the compiler. The procedure of the interpreter is it translates each statement of a source code at a time along with it execute the operation of the source language and find the output because it takes one statement for translation at a single clock cycle so the advantage is it detects the error very frequently than the compiler.

Assembler:

Sometimes compiler during translation produces the assembly language as an output so to process the assembly language we use the assembler which converts the assembly language to machine-level language. In assembly language, the production of output is very frequent and easy, and also the debugging process in assembly language is easier than in other languages.

A preprocessor is software that can convert a source code that is in a high-level language to another high-level language.