Why learning C is a must?

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C is a procedural programming language developed by Dennis Ritchie between 1969 and 1973. It was mainly developed as a system programming language to write operating systems. The main features of C include low – level access to memory, simplest set of keywords, and clean style. These features make C language suitable for system programming like operating systems or compiler development.

Despite the generality of high – level languages, C continues to empower the world. Some systems that are used by millions of people and are programmed in C are mentioned below -:

1. Microsoft Windows, Linux, OS X, iOS, Android and Windows Phone kernels are written mostly in C.
2. Databases including Oracle, MySQL and PostgreSQL are coded in C (and C++).

Learning C has a lot of benefits but the foremost thing is that it helps us to understand the underlying architecture of how things work.

Consider a situation in which a man has to buy a car. What he can do is he can buy a car with advanced technological features such as auto-driving mode and auto gear changing. But if he buys a car which does not provide him these features, he will learn how these things actually works. For a person who is comfortable with a manual car will easily adapt an automated car, but for a person who only knows how to drive an automated car will take some time to switch to a manual car. Similarly, if a person learns C programming language first, it will help him to learn other high-level languages as it helps him/her to understand the underlying architecture of operating systems.

Some important advantages of learning C programming language

1. ***C is a middle level language.*** The middle-level languages are somewhere between the *Low-level* machine understandable assembly languages and *High-Level* user-friendly languages. Being a middle- level language, it is as close to the machine language as possible. It reduces the gap between low-level and high-level languages.
2. ***Helps us to understand the fundamentals of Computer Theories.*** Most of the theories related to computers like Computer Networks, Compiler Designing, Computer Architecture and Operating systems are based on C

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programming language. In the modern high-level languages, the machine level details are hidden from the user, so in order to work with CPU cache, memory, network adapters, learning C programming is a must.

3. ***Fewer Libraries –*** C has fewer libraries in comparison to modern high-level languages. Hence, learning C clears the concepts of programming to a great extent as you have to write a lot of things from scratch rather than using a library function for it.

4. ***C is very fast in terms of execution time.*** Programs written and compiled in C executes much faster than compared to any other programming language. C programming language is very fast in terms of execution as it does not have any additional processing overheads such as garbage collection or preventing memory leaks etc. The programmer must take care of these things on his own.

5. ***Memory Manipulation –*** Arbitrary memory address access and pointer arithmetic is an important feature that makes C a perfect fit for system programming (operating systems and compiler designing).

C versus other languages

1. ***C versus C++ -:*** C++ is an extension of C. While still being C-like in syntax and approach, C++ provides many genuinely useful features that aren't available natively in C; namespaces, templates, exceptions, automatic memory management and so on.

2. ***C versus Java -***: Java syntax borrows a great deal from C and C++. Unlike C, though, Java doesn't by default compile to native code. The "write once, run anywhere" philosophy behind Java also allows Java programs to run with relatively little tweaking for a target architecture. By contrast, although C has been ported to a great many architectures, any given C program may still need customization to run properly on, say, Windows versus Linux.

3. ***C versus Python -***: Python emphasizes on speed of development rather than speed of execution. A program that may take an hour to be assembled in C can be assembled in minutes using Python while that program may take seconds to execute in C, but a minute to run in Python.

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Another major difference in memory management. Python programs are fully memory managed by Python runtime, so developers don't have to worry about allocating and freeing memory. On the other hand, writing C programs requires tremendous attention to memory management.

Links -:

https://www.toptal.com/c/after-all-these-years-the-world-is-still-powered-by-c-programming
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