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26 Real-world Applications of C Language | Pythonista Planet

7-8 minutes

Have you learned C programming language recently but don't know what to do with it? Well, you're at the right place. Let's look at the real-world applications of C programming language in this article.

I learned C as my first programming language from college. But I didn't know what was the uses of C language. Now, wonder why it was taught to us at the beginning of our career in schools/colleges? We usually work on Java, Python, PHP, .Net, etc., but do we ever use C in internet programming? Or is it even used anywhere? Let's find the answers to these questions.

What Is C Programming Language?

C is a middle-level language. The code written in system programs using a high-level language like- PHP, Swift, etc., is not directly understood by the CPU and this is the reason why it is compiled into a low-level language. Here comes the use of a middle-level language which provides all building blocks that are needed to produce the desired result. C is a fundamental language that is often used as an introductory programming language in schools/colleges.

C programming language is majorly used in the creation of hardware devices, operating systems, drivers, kernels, etc. It is also used for the development of GUIs and IDEs.

For example: Linux Kernel is written in the C language.

The use of the C language is widespread and now it has become a general-purpose language because of its popularity.

Areas, where C language is used, are:

Browser Design

C is a powerful programming language that can be used to design browsers. Some of the examples are:

- Google file system
- Google Chromium browser
- Google Open Source community has plenty of projects being handled using C
- Mozilla Firefox and Thunderbird – They are open-source email client projects

Language Compiler Design

There are compilers that are used to compile the C language itself, which are Borland Turbo C, GCC, Portable C, etc. But there are many compilers that could be used to compile C as well as other languages which are designed in C language. Some examples are:

- Bloodshed Dev-C
- Clang C

- MinGW
- Apple C

Operating System Design

Operating system (OS) interacts with hardware. It should be built with such a language that has the power to read from a memory location and write to a memory location. C is a language whose code gets translated into machine-level code(assembly language) and it can run on any machine. C can use various system calls and has a pointer concept which makes it desirable. This is the reason why C is preferred in designing operating systems.

Below are few examples:

- Microsoft's Windows kernel
- Linux kernel
- Apple's OS X kernel (iOS)
- Microsoft Windows utilities
- Symbian (Nokia)
- Android
- Windows Phone Kernel

Embedded Systems

An embedded system can be understood as a hardware system having software embedded in it. C language is considered a superlative choice when it comes to scripting applications and drivers of embedded systems, as it is closely related to machine hardware.

For example:

- Coffee Maker
- Microwave
- Climate control Systems
- In a car-
- automatic transmission
- tire pressure detection systems
- sensors (for oxygen, temperature, oil level, etc.)
- memory for seats and mirror settings.
- dashboard display
- anti-lock brakes
- automatic stability control
- cruise control
- climate control
- child-proof locks
- keyless entry
- heated seats
- airbag control

GUI Design

Windows 32 is a C runtime OS that allows you to write Windows GUI (Graphical User Interfaces) applications. But nowadays there is some designing taking place in C with respect to GUI.

Few examples are:

- Adobe Photoshop
- Adobe IllustratorAdobe Premiere
- Adobe Image Ready

Computer Game Development

C language is often used to code games for smartphones like Android or iOS. It is not heavy-duty and mainly uses Objective-C when it comes to the development of games. Here are some common examples of games that are developed in the C language:

- Tic-Tac-Toe
- The Dino game
- The Snake game
- Doom3
- Chess
- bouncing ball
- Archery
- Pong
- Minesweeper

Development of New Programming Languages

C directly or indirectly influences the development of many languages including C++, which is an object-oriented version of C.

- C#
- D
- Java
- Limbo
- JavaScript
- Perl
- UNIX's C Shell
- PHP
- Python

Also C++, Perl, and PHP have syntax and control structures based upon C.

This is the reason why C is introduced to us as one of the basic languages and thus is very important.

Drivers

Device drivers are typically written in C, using the Driver Development Kit (DDK); one needs low-level hardware access here. For example-

- Network driver
- Keyboard driver
- Mouse driver

C language is used in areas where the program must be closely interconnected with the hardware. C, C++, C#, Java, and Objective-C appeared under a strong influence of C.

New Programming Platforms

There are platforms designed based on C, for example- Matlab and Mathematica.

Database Design

We can also design databases using C. Some of the databases we are currently using based on C are:

- Oracle,
- PostgreSQL,
- MySQL,
- MS SQL Server

Mobile

We all use smartphones nowadays and these all are running on C kernel. We already discussed about the kernel above. iOS, Android, and Windows phones use C kernels.

Text Editors

- Vi is the editor written in C which is preferred by Unix/Linux programmers, it is also called VIM editor.
- The FreeDOS version of edlin is also written in C.
- gedit is the default text editor of the GNOME desktop environment. It is designed as a general-purpose text editor which is written in C.

Assembler

An assembler is a program that helps to convert the code in assembly language into machine code. There are many assemblers that are written in C language like:

- GNU Assembler
- Vasm (680×0 and 6502 assembler)
- Xasm(6502 assembler)

Design Language Interpreters

The runtime system and bytecode interpreter are written in standard C. We can also design the interpreters using C language.

For example:

- Python Interpreter- Cpyhton
- MATLAB Interpreter

Other Use Cases of C

You can also use C language in:

- Networking Devices
- Designing Spreadsheet
- 3D Movies
- Compiler production
- IoT application
- Design Medical Applications

Below are some examples that we use in our day to day life, but we are not aware that these apps were developed in C:

- VLC Media Player
- Microsoft Office Suite
- Autodesk Maya
- WINAMP Media Player
- Bloomberg's RDBMS uses C as its core platform development which provides real-time financial information to investors.
- Callas Software develops PDF technology. It includes pdfToolbox, pdfChip, pdfaPilot, pdfGoHTML, which are available in C.

Final Thoughts

There are many programming languages that allow developers to be more productive than C for different kinds of projects like JSON, XML, UI, etc. But notwithstanding that, there are plenty of reasons to believe that C programming will remain active for a long time.

But I believe that C is unbeatable, and almost mandatory, for certain applications. We have already seen enough uses above.