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**What is C++ used for?**

C++ can be found just about everywhere you look. It powers search engines, VR applications, air travel, movie production, and even exploration on Mars! In fact, C++ is one of the most widely-used programming languages there is.

In this article, we’ll take a look at what makes C++ unique and dive into a variety of real-world applications. If you’re interested in learning more about the fundamental programming concepts behind C++, check out our Learn C++ course to get started.

## **What makes C++ unique?**

C++ is a general-purpose programming language, created by Bjarne Stroustrup and his team at Bell Laboratories in 1979. Over the decades, C++ has become the language of choice for certain kinds of applications.

C++ is most popularly used for building large software infrastructure and applications that run on limited resources. Because C++ can directly manipulate the hardware (or machine) that it runs on, programmers can fine-tune their code to run efficiently in any environment, even when there’s limited hardware space or energy available to power the application. This translates to applications that run quickly and reliably on a variety of devices, making C++ ideal for forming the base layer of many important applications.

For these reasons, C++ is an excellent choice for building software that is fast, efficient at managing system resources, and reliable in performing critical tasks.

## **What is C++ used for?**

C++ can be found in a wide variety of industries. Check out the following list for some of the most notable, interesting, and even surprising real-world applications of C++.

### **Operating systems**

C++ plays an important part in well-known operating systems, from MacOS and Windows to mobile operating systems like iOS. In general, operating systems need to be fast and efficient at managing system resources. With the low-level (close to machine code) capabilities of C++, developers can structure their code to make even the smallest details of an operating system fast and energy efficient.

### **Game development**

C++ is one of the most widely-used programming languages in game development. It has been used to create: games, such as World of Warcraft, Counter-Strike, and StarCraft, game engines like Unreal Engine, and gaming consoles, including Xbox, PlayStation, and Nintendo Switch.

Gaming involves lots of resource-intensive functions, whether it’s generating graphics or facilitating multiplayer sessions. C++ helps in optimizing the use of resources, such as allowing programmers to adjust exactly how data structures and memory allocation are handled.

### **IoT devices**

IoT (Internet of Things) devices include embedded systems that often rely on C++. Some examples of these devices are appliances, cars, smartwatches, TVs, and medical devices. Because the hardware is often embedded inside of an object, these devices have to operate with limited computing resources and strict power requirements. C++ helps programmers control how these resources are used in order to run programs more efficiently.

### **Databases**

C++ is used to build popular database tools like MySQL and MongoDB. These databases form the backbone of many well-known applications, including ones created by Google, Netflix, YouTube, Adobe, and more. C++ is ideal for helping structure databases to support efficient storage.

### **Web browsers**

C++ plays a role in web browsers, such as Google Chrome, Mozilla Firefox, Safari, and Opera. It is used to develop back-end services that retrieve information from databases and render code into interactive web pages. C++ helps web browsers carry out these tasks with speed and minimal delays, which means we don’t have to wait long for content to appear on our screens.

### **Machine learning tools**

Machine learning tools, such as TensorFlow, rely on C++ as a back-end programming language. Even though data scientists can use TensorFlow with Python, for example, the core machine learning calculations are carried out with C++ code. In fact, C++ has a large collection of libraries that power these highly-sophisticated calculations that train machine learning models.

### **AR/VR applications**

C++ is widely used for developing augmented reality and virtual reality applications. In fact, many of these applications run on Unreal Engine, which is built using C++. AR/VR applications need to handle large amounts of data that adjust continuously based on input from camera sensors and user interactions. C++ is ideal for helping process all of this data while creating seamless virtual experiences.

### **Scientific research**

C++ plays a notable role in scientific research, from space exploration to high-energy particle physics. At CERN, scientists use C++ for analyzing data on subatomic particles that can help answer questions about how our universe originated. At NASA, C++ has been used to build autonomous driving systems that help the Mars Rovers navigate unknown terrain. Many parts of the International Space Station are built using C++ as well.

### **Financial tools**

Many banks and financial institutions use C++ to build their software infrastructure, which powers applications for banking, trading, and financial modeling. The speed and reliable performance of C++ is ideal for processing millions of daily transactions, facilitating a high volume and frequency of trades, and creating data simulations for large portfolios.

### **Flight software**

C++ is a commonly-used language for flight software that powers commercial airplanes and military and defense aircraft (such as the F-16 and F-35 planes). C++ is used to build a lot of the safety-critical software, which is required to follow strict coding standards to make sure that the wings, engines, and other critical parts work predictably during each flight.

### **Google search engine**

Google’s search engine relies on C++ to make sure that search results show up quickly and with minimal response time. C++ also powers the machine learning and other complex algorithms that make sure we get the best possible results for our search. Google’s crawling and indexing infrastructure is also implemented in C++.

### **Medical technology**

C++ can be found in a variety of medical applications, from MRI machines to lab testing equipment to systems that handle patient information. C++ is also used to model data and run data simulations for bioinformatics research, because many advanced algorithms written for the medical and biological sciences are implemented in C++.

### **Telecommunications**

C++ is widely used in building telephone, Internet, and other telecommunications infrastructure. It’s ideal for managing resources to handle tons of simultaneous communication with speed and efficiency.

### **Movie production**

Many of the graphics and special effects that you see in movies are created with C++. C++ is great for this role because it can handle large files with high-quality footage and run many of the advanced calculations that make the special effects possible.