C++

LEARN IN 1 DAY

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Learn C++ in 1 Day

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Chapter 1: C++ Programming: What is C++ | Learn Basic Concepts of C++

What is C++?

C++ is a general-purpose, object-oriented programming language. It was created by Bjarne Stroustrup at Bell Labs circa 1980. C++ is very similar to C (invented by Dennis Ritchie in the early 1970s). C++ is so compatible with C that it will probably compile over 99% of C programs without changing a line of source code. Though C++ is a lot of well-structured and safer language than C as it OOPs based.

Some computer languages are written for a specific purpose. Like, Java was initially devised to control toasters and some other electronics. C was developed for programming OS. Pascal was conceptualized to teach proper programming techniques. But C++ is a general-purpose language. It well deserves the widely acknowledged nickname "Swiss Pocket Knife of Languages." In this introduction to C++ tutorial, you will learn C++ basic concepts-

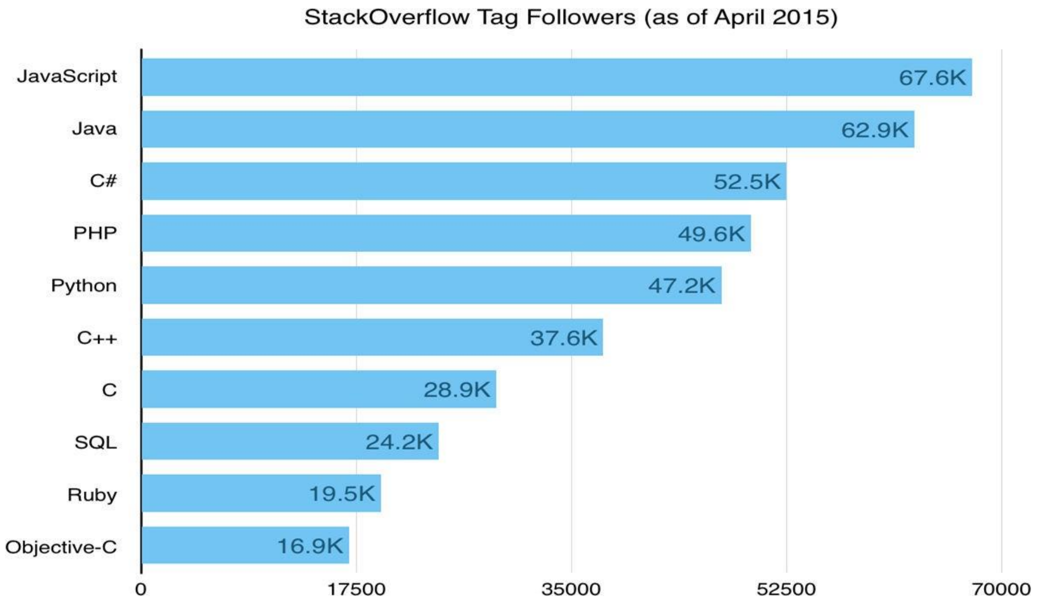
- What is C++?
- Popular programming languages in use?
- Is C++ best programming language?
- Who uses C++?
- Five Basic Concepts of C++
- Use of C++ Programming Language

Popular programming languages in use?

Popular languages that are mainly in use are Java, C++, Python, and C. Lower level languages like

- Assembly Language
- C
- C++

These languages force the programmer to think more about the problem in computer programming terms and its implementations, instead of the business logic.



As you can see despite being old, C++ is relatively popular still today which is a feat in and its own. The graph is from stackoverflow.com

Is C++ best programming language?

The answer depends on perspective and requirements. Some tasks can be done in C++, though not very quickly. For example, designing GUI screens for applications. Other languages like Visual Basic, Python have GUI design elements built into them. Therefore, they are better suited for GUI type of task. Some of the scripting languages that provide extra programmability to applications. Such as MS Word and even photoshop tend to be variants of Basic, not C++. C++ is still used widely, and the most famous software have their backbone in C++. This tutorial will help you learn C++ basic and the advanced concepts.

Who uses C++?

Some of today's most visible used systems have their critical parts written in C++. Examples are Amadeus (airline ticketing)

- Bloomberg (financial formation),
- Amazon (Web commerce), Google (Web search)
- Facebook (social media)

Many programming languages depend on C++'s performance and reliability in their implementation. Examples include:

- Java Virtual Machines
- JavaScript interpreters (e.g., Google's V8)
- Browsers (e.g., Internet Explorer, Mozilla's Firefox, Apple's Safari, and Google's Chrome)
- Application and Web frameworks (e.g., Microsoft's .NET Web services framework).

Applications that involve local and wide area networks, user interaction, numeric, graphics, and database access highly depend on C++ language.

Five Basic Concepts of C++

Here are five basic C++ concepts:

C++ Variables

- Variables are the backbone of any programming language.
- A variable is merely a way to store some information for later use. We can retrieve this value or data by referring to a “word” that will describe this information.
- Once declared and defined they may be used many times within the scope in which they were declared.

C++ Control Structures

- When a program runs, the code is read by the compiler line by line (from top to bottom, and for the most part left to right). This is known as “**code flow.**”
- When the code is being read from top to bottom, it may encounter a point where it **needs to make a decision**. Based on the decision, the program may jump to a different part of the code. It may even make the compiler re-run a specific piece again, or just skip a bunch of code.
- You could think of this process like if you were to choose from different courses from Guru99. You decide, click a link and skip a few pages. In the same way, a computer program has a set of strict rules to decide the flow of program execution.

C++ Data Structures

Let’s use a list of courses on “guru99” as the example! You probably have a list of courses in front of you. But how do you think they stored that. There can be a lot of courses, and different users may register for different courses. Do they generate a different variable for each user? For example, let’s say we need to keep track of 10 courses. First, the **WRONG**

WAY: If we need to store 10 courses, we would probably define 10 variables, right? Wrong. In the world of programming, this is just a horrible way of trying to store 10 different variables. This is because of two main reasons:

- The huge amount of text that you'll need to write in your program. Sure, right now we only have 10 courses, so it's not too bad, but what if we had 1,000 courses! Imagine typing that out a thousand times! Forget about it!
- The flexibility. Adding another course would need manual edits to the code. We would have created variable COURSE11. This is just crazy!

So, what is the **RIGHT WAY**?

Storing them in data structures.

A **data structure** is a great **way to get around having to create thousands of variables.** C++ contains many types of inbuilt data structures. Most often used is arrays which will be taught later.

C++ Syntax

The syntax is a layout of words, expression, and symbols. Well, it's because an email address has its well-defined syntax. You need some combination of letters, numbers, potentially with underscores (_) or periods (.) in between, followed by an at the rate (@) symbol, followed by some website domain (company.com). So, syntax in a programming language is much the same. They are some well-defined set of rules that allow you to create some piece of well-functioning software. But, if you don't abide by the rules of a programming language or syntax, you'll get errors.

C++ Tools

In the real world, a tool is something (usually a physical object) that helps you to get a certain job done promptly. Well, this holds true with the programming world too. A tool in programming is some piece of software which when used with the code allows you to program faster. There are probably tens of thousands, if not millions of different tools across all the programming languages. Most crucial tool, considered by many, is an IDE, an **Integrated Development Environment.** An IDE is a software which will make your coding life so much easier. IDEs ensure that your files and folders are organized and give you a nice and clean way to view them.

Use of C++ Programming Language

Here are some prime uses of C++ Programming Language:

Operating Systems:

Wheater it is Microsoft Windows or Mac OSX or Linux - all of the operating systems have some parts which are programmed in C++. It is the backbone of all the well-known OSs as C++ is a strongly typed and quick programming language, that makes it an ideal choice for developing an operating system.

Games:

Because of the fact that it is one of the fastest programming languages, C++ is widely used in programming of game development engines. C++ can easily manipulate hardware resources and it can also provide procedural programming for CPU intensive functions.

Browsers:

The rendering engines of various web browsers are programmed in C++ because of the speed it offers.

Libraries:

Many high-level libraries use C++ as the core programming language. For example, several Machine Learning libraries use C++ in the backend because of its speed.

Graphics:

C++ is widely used in almost all graphics applications that require fast rendering, image processing, real-time physics and mobile sensors.

Banking Applications:

One of the most popularly used core-banking systems - Infosys Finacle, uses C++ as the backend programming language. Banking applications need to process millions of transactions on a daily basis and require high concurrency and low latency support.

Cloud/Distributed Systems:

Cloud storage systems use scalable file-systems that work close to the hardware. That’s why C++ becomes a preferred choice for Cloud systems.

Embedded Systems:

Various embedded systems like medical machines, smartwatches, etc., use C++ as the primary programming language.

Compilers:

Compilers of various programming languages use C++ as the backend programming language.

Chapter 2: How to Download and Install C++ IDE on Windows

What is Dev-C++?

Dev-C++, developed by Bloodshed Software, is a fully-featured graphical IDE (Integrated Development Environment) for C and C++ programming. It is distributed under the GNU General Public License for programming in C and C++.

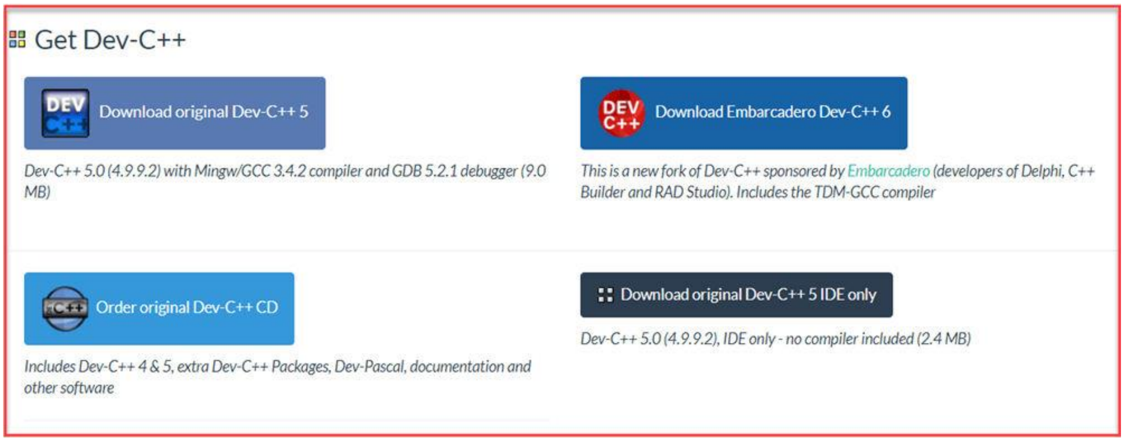
How to Download and Install Dev C++ on Windows

There are many compilers available for C++ programming. You can download anyone. Here, we are going to use Dev C++. It will work for both C++ and C programming languages.

To install Dev C++ software, you need to follow the following steps.

Step 1) First you must download the Dev C++ on your Windows machine. Visit to Download Dev C++: http://www.bloodshed.net/

Step 2) There are packages for different Operating Systems.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Order original Dev-C++ CD
Download original Dev-C++ 5 IDE only

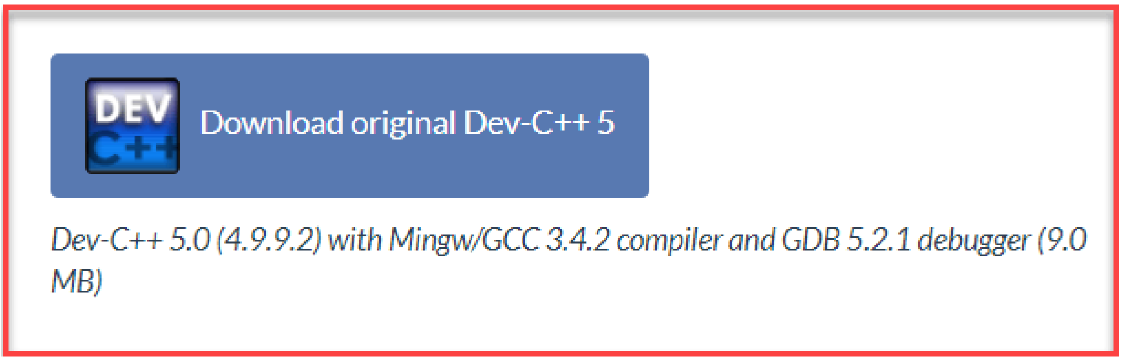
Dev-C++ 5.0 (4.9.9.2) with Mingw/GCC 3.4.2 compiler and GDB 5.2.1 debugger (9.0 MB)

This is a new fork of Dev-C++ sponsored by Embarcadero (developers of Delphi, C++ Builder and RAD Studio). Includes the TDM-GCC compiler

Includes Dev-C++ 4 & 5, extra Dev-C++ Packages, Dev-Pascal, documentation and other software

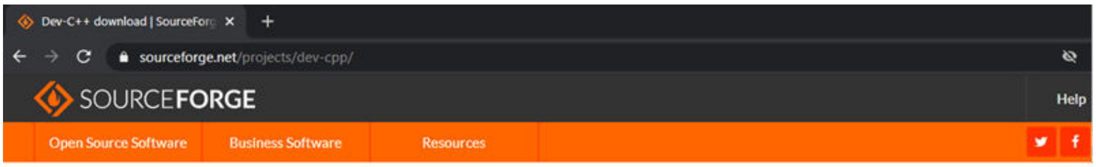
Dev-C++ 5.0 (4.9.9.2), IDE only - no compiler included (2.4 MB)

Step 3) Under package Dev-C++ 5.0 (4.9.9.2) with Mingw/GCC 3.4.2 compiler and GDB 5.2.1 debugger (9.0 MB) Click on the link “Download from SourceForge”.



Dev-C++ 5.0 (4.9.9.2) with Mingw/GCC 3.4.2 compiler and GDB 5.2.1 debugger (9.0 MB)

Step 4) This package will download C++ **.exe file** for Windows that can be used to install on Windows 7/8/XP/VISTA/10.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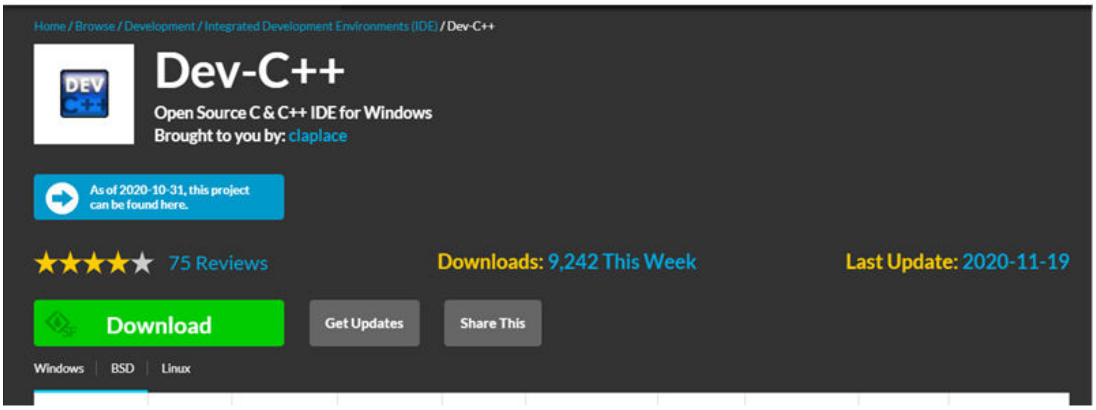
Home / Browse / Development / Integrated Development Environments (IDE) / Dev-C++
Dev-C++
Open Source C & C++ IDE for Windows
Brought to you by: claplace
As of 2020-10-31, this project can be found here.
★★★★★ 75 Reviews
Downloads: 9,242 This Week
Last Update: 2020-11-19
Download
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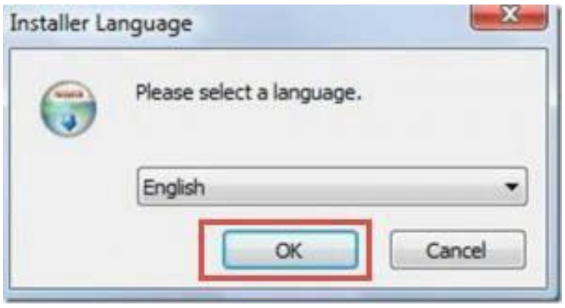
Step 5) You will direct to SourceForge website, and your C++ download will start automatically.

- Click on save button to save. By default, it is saved in "Downloads" folder.
- After the download completes, go to the saved .exe file and click on it to Run.
- The installer will ask you a language to select. Select "English" and click on "OK".

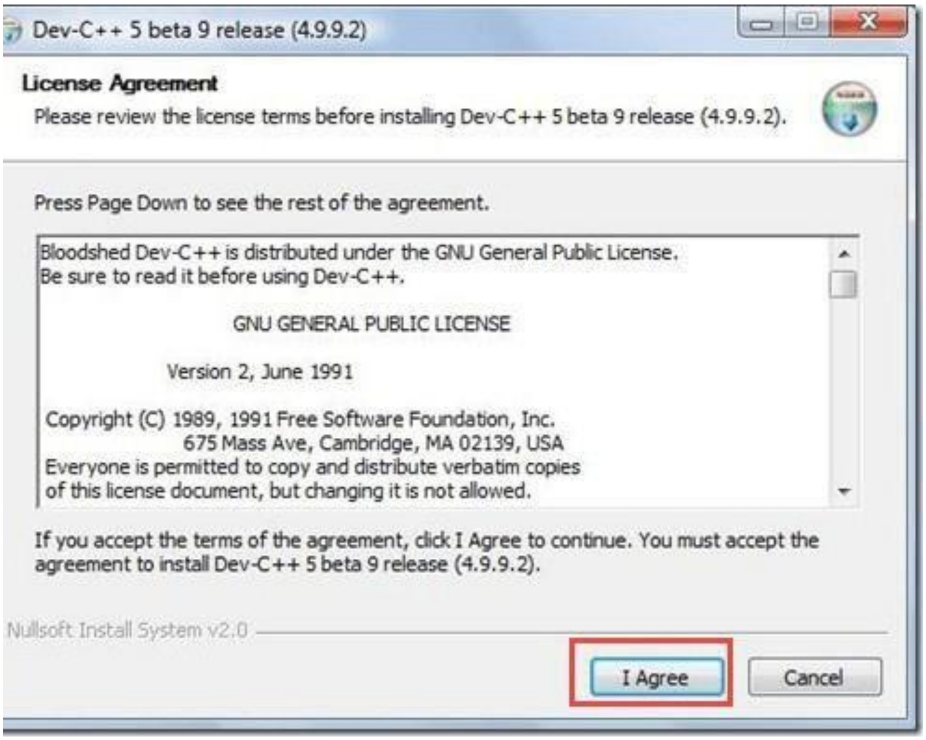


Installer Language

Please select a language.

English

- Then screen for license agreement will appear. Click on "I agree" to proceed further.



Dev-C++ 5 beta 9 release (4.9.9.2)

License Agreement

Please review the license terms before installing Dev-C++ 5 beta 9 release (4.9.9.2).

Press Page Down to see the rest of the agreement.

Bloodshed Dev-C++ is distributed under the GNU General Public License.
Be sure to read it before using Dev-C++.

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

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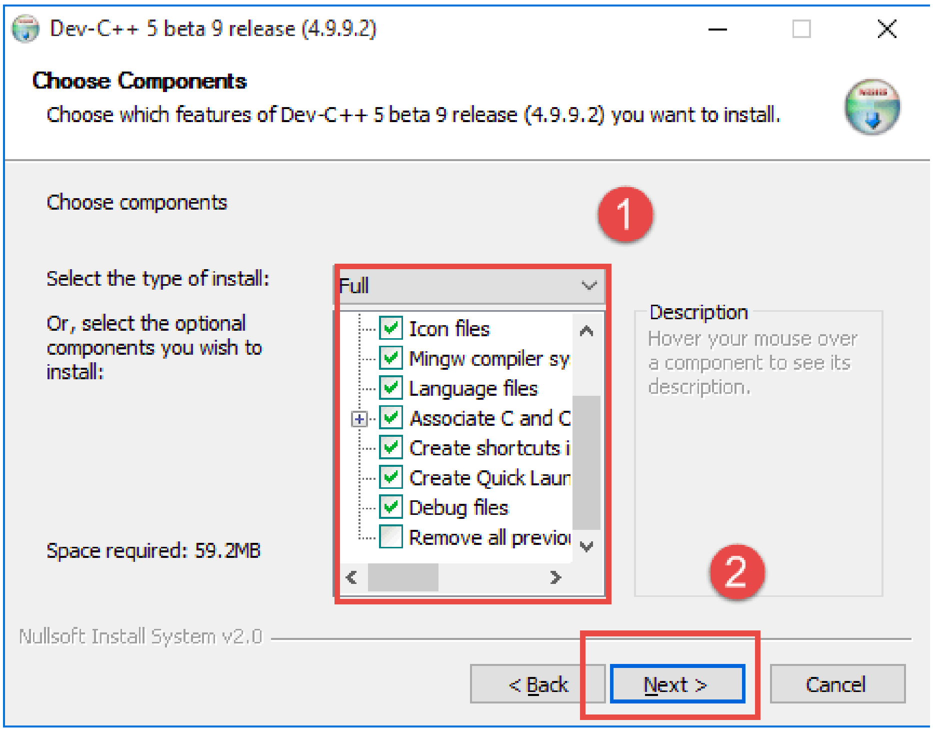
of this license document, but changing it is not allowed.

If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install Dev-C++ 5 beta 9 release (4.9.9.2).

Nullsoft Install System v2.0

Step 6) In this step,

1. You can see different components of Dev C++ that will be installed with this package.
2. Just click on “next” button.



Dev-C++ 5 beta 9 release (4.9.9.2)

Choose Components

Choose which features of Dev-C++ 5 beta 9 release (4.9.9.2) you want to install.

Choose components

Select the type of install: Full

Or, select the optional components you wish to install:

- ☑ Icon files
- ☑ Mingw compiler sy
- ☑ Language files
- ☑ Associate C and C
- ☑ Create shortcuts i
- ☑ Create Quick Laur
- ☑ Debug files
- □ Remove all previo

Space required: 59.2MB

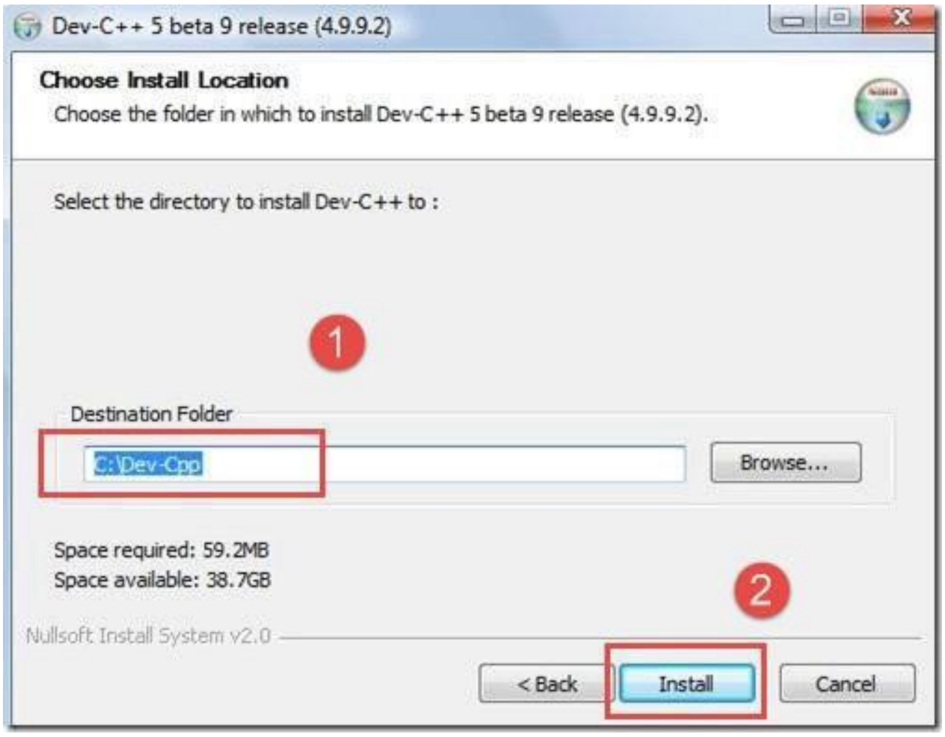
Description

Hover your mouse over a component to see its description.

Nullsoft Install System v2.0

Step 7) In this step,

1. By default, the destination folder is in C drive. You are free to change this destination folder but make sure you have enough memory.
2. Click on “Install” button.



Dev-C++ 5 beta 9 release (4.9.9.2)

Choose Install Location

Choose the folder in which to install Dev-C++ 5 beta 9 release (4.9.9.2).

Select the directory to install Dev-C++ to :

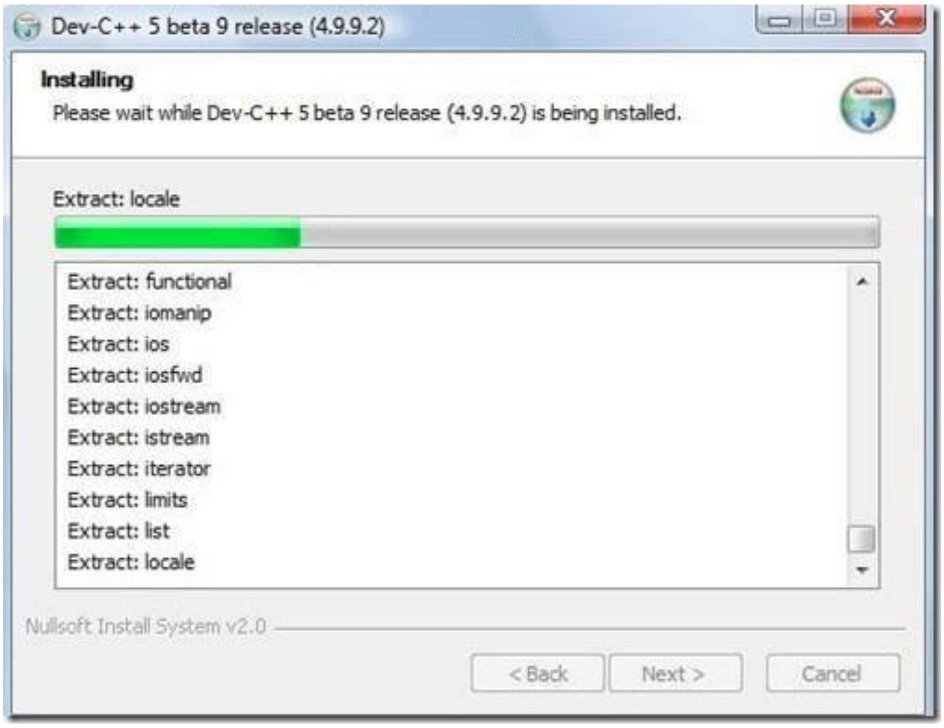
Destination Folder

C:\Dev-Cpp

Space required: 59.2MB

Space available: 38.7GB

In the next screen, installation begins



Dev-C++ 5 beta 9 release (4.9.9.2)

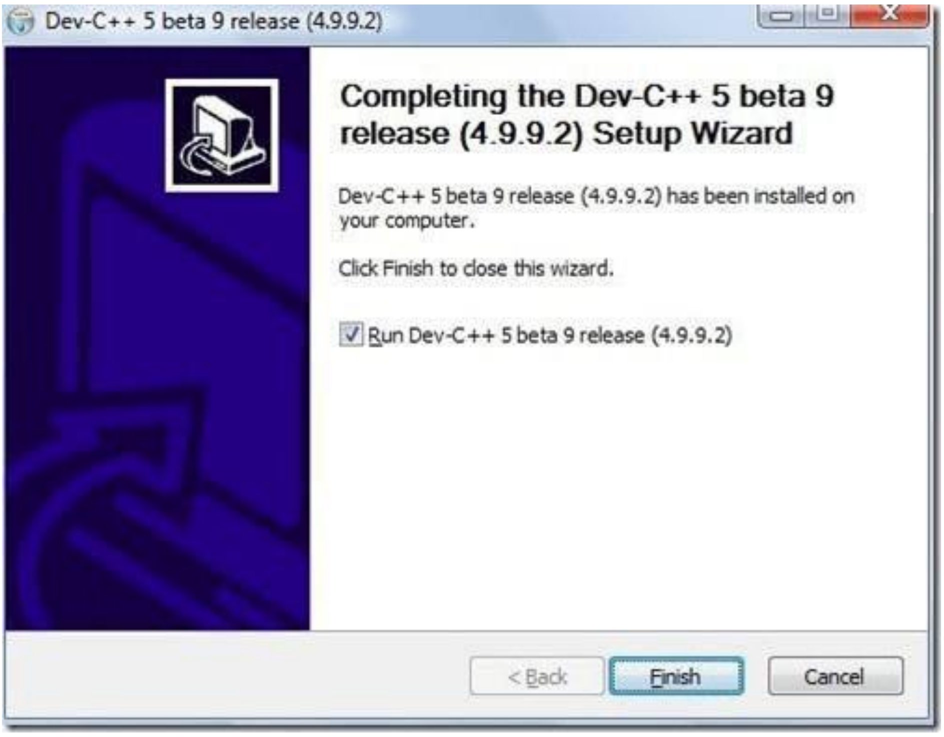
Installing

Please wait while Dev-C++ 5 beta 9 release (4.9.9.2) is being installed.

Extract: locale

```
Extract: functional
Extract: iomanip
Extract: ios
Extract: iosfwd
Extract: iostream
Extract: istream
Extract: iterator
Extract: limits
Extract: list
Extract: locale
```

Now, Dev C++ is installed successfully on your Windows. Select " Run Dev C++" to run it and click on " Finish" button.



Completing the Dev-C++ 5 beta 9 release (4.9.9.2) Setup Wizard

Dev-C++ 5 beta 9 release (4.9.9.2) has been installed on your computer.

Click Finish to close this wizard.

☑ Run Dev-C++ 5 beta 9 release (4.9.9.2)

That's it! Now you are ready to compile your C or C++ programs with Dev C++ compiler.

Features Of Dev-C++ IDE

Here are some important features of Dev-C++ IDE:

- Dev-C++ IDE allows us to use integrated debugging using GDB.
- Localization feature that provides support for multiple languages.
- Offers editing and compiling the resource files.
- It has a inbuilt find and replace facility.
- Helps you to create your own project templates to create project types.
- It offers support for class browser as well as debug variable browser.
- Provides project manager feature that helps you to manage various projects.
- Provides CVS support for source code management.