

C-Programming

C is a high-level, structure oriented programming language, used in general purpose programming. It was developed by Dennis Ritchie at AT&T Bell Laboratories, USA between 1969 and 1973. Some of its features are as follows:

Features of C language

1. It is a robust language with a rich set of built-in functions and operators that can be used to write any complex program.
2. The C compiler combines the capabilities of an assembly-level language with features of a high-level language.
3. Programs written in C are efficient and fast. This is due to its variety of data types and powerful operators.
4. C is highly portable i.e. programs once written can be run on another machine with little or no modification.
5. Another important feature of a C program is its ability to extend itself.
6. A C program is basically a collection of functions that are supported by the C library. We can also create our own functions and add it to the C library.
7. Nowadays, C is one of the most used languages for operating systems and embedded systems development.

IDEs for C Programming

1. Code::Blocks: Code::blocks is an open source, cross-platform and extensible IDE for C & C++. The best feature of this IDE is that it can be extended as per your requirements, with the help of available plugins.
2. Dev C++: Dev C++ makes use of MinGW port of GCC as its compiler. Dev C++ also supports C language, and its feature includes the GCC based compiler, auto code completion, syntax highlighting, project manager and print support.
3. Eclipse: Eclipse IDE is an open source utility that offers some advanced functionalities for C/C++ programmers. It has some impressive features such as syntax highlighting, debugger and auto code completion. In addition, Eclipse IDE also makes coding simpler for new programmers.
4. Sky IDE: Sky IDE is a multi-compiler, multi-view, multi-project and multi-profile C++ IDE. Sky IDE also supports various other languages such as Java, PHP and JavaScript. In addition, Sky IDE also has powerful text manipulation, syntax highlighting, auto code completion and line tracker functions.

5. **NetBeans IDE:** NetBeans is another advance open source IDE with features such as semantic highlighting, automatic formatting, braces matching, unit testing, code assistance and much more.

Format Specifiers & Escape Sequences

Format specifiers can be defined as the operators which are used in association with `printf()` function for printing the data that is referred by any object or any variable. When a value is stored in a particular variable, then you cannot print the value stored in the variable straightforwardly without using the format specifiers. Format specifiers start with a percentage `%` operator and followed by a special character for identifying the type of the data.

There are mostly six types of format specifiers that are available in C.

1. **Integer Format Specifier (`%d`)** – The `%d` format specifier is implemented for representing integer values. For example - `printf("%d",<variable name>);`.
2. **Float Format Specifier (`%f`)** – The `%f` format specifier is implemented for representing fractional values. For example - `printf("%f",<variable name>);`.
3. **Character Format Specifier (`%c`)** – The `%c` format specifier is implemented for representing characters. For example - `printf("%c",<variable name>);`.
4. **String Format Specifier (`%s`)** – The `%s` format specifier is implemented for representing strings. For example - `printf("%s",<variable name>);`.
5. **Unsigned Integer Format Specifier (`%u`)** – The `%u` format specifier is implemented for fetching values from the address of a variable having unsigned decimal integer stored in the memory. For example - `printf("%u",<variable name>);`.
6. **Long Int Format Specifier** – The `%ld` format specifier is implemented for representing long integer values. For example - `printf("%ld",<variable name>);`.

C supports some character constants having a backslash in front of it. The lists of backslash characters have a specific meaning which is known to the compiler. They are also termed as an "Escape Sequence".

Constants	Meaning
<code>\a</code>	beep sound
<code>\b</code>	backspace
<code>\n</code>	new line
<code>\r</code>	carriage return
<code>\t</code>	horizontal tab

Precedence of Operators

Here, operators with the highest precedence appear at the top of the table, those with the lowest appear at the bottom. Within an expression, higher precedence operators will be evaluated first.

Category	Operator	Associativity
Postfix	() [] -> . ++ --	Left to right
Unary	+ - ! ~ ++ -- (type)* & sizeof	Right to left
Multiplicative	* / %	Left to right
Additive	+ -	Left to right
Shift	<< >>	Left to right
Relational	< <= > >=	Left to right
Equality	== !=	Left to right
Bitwise AND	&	Left to right
Bitwise XOR	^	Left to right
Bitwise OR		Left to right
Logical AND	&&	Left to right
Logical OR		Left to right
Conditional	?:	Right to left
Assignment	= += -= *= /= %= >>= <<= &= ^= =	Right to left
Comma	,	Left to right