

# C++ Programming

## from Beginner to Expert

### Chapter 2 : Introduction to C++ Programming, Input/Output and Operators

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Consider a simple program that prints a line of text (Fig. 2.1). This program illustrates several important features of the C++ language. The text in lines 1–10 is the program's source code. The line numbers are not part of the source code.

```
1 // Fig. 2.1: fig02_01.cpp
2 // Text-printing program.
3 #include <iostream> // enables program to output data to the screen
4
5 // function main begins program execution
6 int main() {
7     std::cout << "Welcome to C++!\n"; // display message
8
9     return 0; // indicate that program ended successfully
10 }
```

output

Welcome to C++!



Escape sequence	Description
<code>\n</code>	Newline. Position the screen cursor to the beginning of the next line.
<code>\t</code>	Horizontal tab. Move the screen cursor to the next tab stop.
<code>\r</code>	Carriage return. Position the screen cursor to the beginning of the current line; do not advance to the next line.
<code>\a</code>	Alert. Sound the system bell.
<code>\\</code>	Backslash. Used to print a backslash character.
<code>\'</code>	Single quote. Used to print a single-quote character.
<code>\"</code>	Double quote. Used to print a double-quote character.



Operation	Arithmetic operator	Algebraic expression	C++ expression
Addition	+	$f + 7$	<code>f + 7</code>
Subtraction	-	$p - c$	<code>p - c</code>
Multiplication	*	$bm$ or $b \cdot m$	<code>b * m</code>
Division	/	$\frac{x}{y}$ or $x/y$ or $x \div y$	<code>x / y</code>
Remainder	%	$r \bmod s$	<code>r % s</code>

## Precedence of Arithmetic Operators



Operator(s)	Operation(s)	Order of evaluation (precedence)
( )	Parentheses	Evaluated first. For nested parentheses, such as in the expression $a * (b + c / (d + e))$ , the expression in the innermost pair evaluates first. [Caution: If you have an expression such as $(a + b) * (c - d)$ in which two sets of parentheses are not nested, but appear "on the same level," the C++ Standard does not specify the order in which these parenthesized subexpressions will evaluate.]
* / %	Multiplication Division Remainder	Evaluated second. If there are several, they're evaluated left to right.
+ -	Addition Subtraction	Evaluated last. If there are several, they're evaluated left to right.

Algebraic relational or equality operator	C++ relational or equality operator	Sample C++ condition	Meaning of C++ condition
Relational operators			
$>$	<code>&gt;</code>	<code>x &gt; y</code>	x is greater than y
$<$	<code>&lt;</code>	<code>x &lt; y</code>	x is less than y
$\geq$	<code>&gt;=</code>	<code>x &gt;= y</code> or	x is greater than or equal to y
$\leq$	<code>&lt;=</code>	<code>x &lt;= y</code>	x is less than or equal to y
Equality operators			
$=$	<code>==</code>	<code>x == y</code>	x is equal to y
$\neq$	<code>!=</code>	<code>x != y</code>	x is not equal to y