



# Introduction to C++ Programming

# Table of contents

01

## Introduction

Programming / C++

02

## Data Types

Working with Memory

03

## Operators

Computation  
Calculation

04

## Conditionals

Decision Making

05

## Loops(I)

Repetitive actions

06

## Loops(II)

Implementing Algorithms



The background is a dark blue field filled with glowing light blue circuit traces and lines. Several stylized computer monitor icons are scattered across the scene, some appearing to float or be part of the circuitry. A large, dark blue square with a thin black border is positioned in the upper left, containing the number '01'. A large, dark blue rectangle with a thin yellow border occupies the lower half of the image, containing the title 'Introduction to C++'.

01

# Introduction to C++

# Before start coding...

What is a programming language?

Binary  $\rightarrow$  0/1

From Code text to Binary file

Integrated Development Environment

What is a Computer?

Hello World!



The background is a dark blue field filled with glowing light blue circuit lines and several computer monitor icons. Some icons are larger and more prominent, while others are smaller and positioned further back, creating a sense of depth. The overall aesthetic is high-tech and digital.

02

# Data Types

# Variable

```
variable_type variable_name = initial value ;
```

```
variable_type variable_name ;
```

```
variable_name = value ;
```

# C++ data types

sizeof()

Data Type	Size	Description
boolean	1 byte	Stores true or false values
char	1 byte	Stores a single character/letter/number, or ASCII values
int	2 or 4 bytes	Stores whole numbers, without decimals
float	4 bytes	Stores fractional numbers, containing one or more decimals. Sufficient for storing 6-7 decimal digits
double	8 bytes	Stores fractional numbers, containing one or more decimals. Sufficient for storing 15 decimal digits

[www.w3schools.com](http://www.w3schools.com)



# More or Less Bytes!

Data Type	Size (in bytes)	Range
short int	2	-32,768 to 32,767
unsigned short int	2	0 to 65,535
unsigned int	4	0 to 4,294,967,295
int	4	-2,147,483,648 to 2,147,483,647
long int	4	-2,147,483,648 to 2,147,483,647
unsigned long int	4	0 to 4,294,967,295

long long int	8	$-(2^{63})$ to $(2^{63})-1$
unsigned long long int	8	0 to 18,446,744,073,709,551,615
signed char	1	-128 to 127
unsigned char	1	0 to 255
float	4	$-3.4 \times 10^{38}$ to $3.4 \times 10^{38}$
double	8	$-1.7 \times 10^{308}$ to $1.7 \times 10^{308}$
long double	12	$-1.1 \times 10^{4932}$ to $1.1 \times 10^{4932}$
wchar_t	2 or 4	1 wide character

[www.geeksforgeeks.org](http://www.geeksforgeeks.org)



# C++ has string type

```
string var_name = "initialization" ;  
cout << var_name << endl ;
```

The background is a dark blue field filled with glowing light blue circuit traces and lines. Several computer monitor icons are scattered throughout, some appearing as faint outlines and others as more prominent, glowing shapes. A large, dark blue square with a thin black border is positioned in the upper left, containing the number '03'. A large, dark blue rectangle with a thin yellow border occupies the lower half of the image, containing the word 'Operators'.

03

# Operators

# Different kinds of operators

	Operator	Type
Unary operator →	++, --	Unary operator
Binary operator {	+, -, *, /, %	Arithmetic operator
	<, <=, >, >=, ==, !=	Relational operator
	&&,   , !	Logical operator
	&,  , <<, >>, ~, ^	Bitwise operator
	=, +=, -=, *=, /=, %=	Assignment operator
Ternary operator →	?:	Ternary or conditional operator

[www.geeksforgeeks.org](http://www.geeksforgeeks.org)

```
#include <bitset>
bitset<size>(variable)
```

```
#include <math.h>
#include <cmath>
```



# Input & Output

```
#include <iostream>

using namespace std;

int main()
{
    int a ;
    cin >> a ;
    cout << a ; |
    return 0;
}
```

The background is a dark blue field filled with glowing light blue circuit lines and several computer monitor icons. Some icons are in the foreground, appearing larger and more detailed, while others are smaller and further back, creating a sense of depth. The overall aesthetic is high-tech and digital.

04

# Conditionals

# if statement

```
#include <iostream>

using namespace std;

int main()
{
    code1...;
    if (condition)
    {
        code2...;
    }
    code3...;
    return 0;
}
```



# if-else statement

```
#include <iostream>

using namespace std;

int main()
{
    code1...;
    if (condition)
    {
        code2...;
    }
    else
    {
        code3...
    }
    code4...;
    return 0;
}
```

# if-else if-else statement

```
#include <iostream>

using namespace std;

int main()
{
    code1...;
    if (condition1) { code2...; }
    else if (condition2) { code3...; }
    else if (condition3) { code4...; }
    else { code5...; }
    code6...;
    return 0;
}
```

# switch-case statement

```
#include <iostream>

using namespace std;

int main()
{
    code1...;
    switch (expression)
    {
        case x:
            code2...;
            break;
        case y:
            code3...;
            break;
        default:
            code4...;
    }
    code5...;
    return 0;
}
```





Thanks!