Types of C++ Variables

A variable is a memory place in which you can store a value and from which you canlater retrieve that value. Notice that this temporary storage is used only during theexecution of the program.

The following table summarizes the fundamental C++ variables.

	Type	Size in Bytes	Values
integer variables	unsigned short int	2	0 to 65,535
	short int	2	-32,768 to 32,767
	unsigned int	4	0 to 4,294,967,295
	int	4	-2,147,483,648 to 2,147,483,647
	unsigned long int	4	0 to 4,294,967,295
	long int	4	-2,147,483,648 to 2,147,483,647
	long long int	8	9.223.372.036.854 to 9.223.372.036.853
floating-point variables	float	4	1.2e-38 to 3.4e38
	double	8	2.2e-308 to 1.8e308
logical variable	bool	1	true or false
character variable	char	1	256 character values

Always name your variables with a great care, and explain them thoroughly.

- **Integer variables** store whole numbers (-4, 3, 51, etc). Unsigned integer type variables cannot have negative values, whereas other integer type variables (signed integers) may have negative and positive values.
- **Floating-point variables** store decimal numbers (3.5, -5,123, 4.0, etc).

- **Logical variables** store the result of logical expressions and get only the values true and false. False is represented with 0 and true is represented with a positive value (usually 1) in C++. Logical expressions are usually used in decision and repetition structures to control the flow of the program.
- **Character variables** are used to store characters (letters, numbers, punctuation characters, etc). Characters are enclosed with a pair of single quotes in C++, like 'a', 'B', '7', '+', etc.

The **sizes of variables** might be different from those shown in the table, depending on the compiler and the computer you are using. Use **sizeof()** operator to measure the sizes of variable types in your system. The **sizeof()** operator returns the number of bytes in variable or type.

```
/*
PROG: C1_06sizeof.cpp
C++ variable types and their sizes in bytes
*/
#include <iostream>
using namespace std;
int main()
{
  cout <<"int = "<<sizeof(int)<<endl;
  cout <<"short int = "<<sizeof(short int)<<endl;
  cout <<"long int = " <<sizeof(long int)<<endl;
  cout << "long long int =" <<sizeof(long long int)<<endl;

  cout <<"float = "<<sizeof(float)<<endl;
  cout <<"double ="<<sizeof(double)<<endl;
  cout <<"long double ="<<sizeof(double)<<endl;

  cout <<"bool ="<<sizeof(bool)<<endl;

  cout <<"char ="<<sizeof(char)<<endl;

  system("pause");  return 0;
}
```

```
int = 4
short int = 2
long int = 4
long long int =8
float = 4
double =8
long double =8
bool =1
char =1
Press any key to continue . . .
```