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Programming in C++
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Tutorial Notes #9
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C++ Program – Adding Integers

Our next program uses the input stream object std::cin and the stream extraction operator, >>, to obtain two integers typed by a user at the keyboard, computes the sum of these values and outputs the result using std::cout.

```
1  //
2  //  AddingIntegers.cpp
3  //  TutorialClass
4  //  Addition program that displays the sum of two integers.
5
6  #include <iostream> // allows program to perform input and output
7
8  int main()
9  {
10     // variable declarations
11     int number1;    // first integer to add
12     int number2;    // second integer to add
13     int sum;        // sum of number1 and number2
14
15     std::cout << "Enter first integer: "; // prompt user for data
16     std::cin >> number1; // read first integer from user into number1
17
18     std::cout << "Enter second integer: "; // prompt user for data
19     std::cin >> number2; // read second integer from user into number2
20
21     sum = number1 + number2; // add the numbers; store result in sum
22     std::cout << "Sum is " << sum << std::endl; // display sum; end line
23 } // end function main
```

```
Enter first integer: 45
Enter second integer: 72
Sum is 117
```

Variable Declarations

Lines 11–13 are declarations. The identifiers number1, number2 and sum are the names of variables. A variable is a location in the computer's memory where a value can be stored for use by a program. These declarations specify that the variables number1, number2 and sum are data of type int, meaning that these variables will hold integer values, i.e., whole numbers such as 7, –11, 0 and 31914.

Fundamental Types
Types such as int, double, float, bool and char are called fundamental types. Fundamental-type names are keywords and therefore must appear in all lowercase letters.

Identifiers
A variable name (such as number1) is any valid identifier that is not a keyword. An identifier is a series of characters consisting of letters, digits and underscores (_) that does not begin with a digit.

Placement of Variable Declarations
Declarations of variables can be placed almost anywhere in a program, but they must appear before their corresponding variables are used in the program.

Obtaining the Value from the User
Line 15 displays Enter first integer: followed by a space. This message is called a prompt because it directs the user to take a specific action.
Line 16 uses the standard input stream object cin (of namespace std) and the stream extraction operator, >>, to obtain a value from the keyboard.

Calculating the Sum of the Values Input by the User
The assignment statement in line 19 adds the values of variables number1 and number2 and assigns the result to variable sum using the assignment operator =.

Displaying the Result
Line 22 displays the character string *`Sum is`* followed by the numerical value of variable `sum` followed by `std::endl`—a so-called stream manipulator.
The name endl is an abbreviation for "end line" and belongs to namespace std. The std::endl stream manipulator outputs a newline, then "flushes the output buffer."