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Programming in C++
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Lesson Note #36
June 15, 2015

Adapted from C++ How To Program edited for our own purposes

Default Arguments

It's common for a program to invoke a function repeatedly with the same argument value for a particular parameter. In such cases, you can specify that such a parameter has a default argument, i.e., a default value to be passed to that parameter. When a program omits an argument for a parameter with a default argument in a function call, the compiler rewrites the function call and inserts the default value of that argument.

Default arguments must be the rightmost (trailing) arguments in a function's parameter list. When calling a function with two or more default arguments, if an omitted argument is not the rightmost argument in the argument list, then all arguments to the right of that argument also must be omitted.

Default arguments must be specified with the first occurrence of the function name—typically, in the function prototype. If the function prototype is omitted because the function definition also serves as the prototype, then the default arguments should be specified in the function header. Default values can be any expression, including constants, global variables or function calls. Default arguments also can be used with inline functions.

```cpp
3   #include <iostream>
4   using namespace std;
5
6   // function prototype that specifies default arguments
7   int boxVolume( int length = 1, int width = 1, int height = 1 );
8
9   int main()
10  {
11     // no arguments--use default values for all dimensions
12     cout << "The default box volume is: " << boxVolume();
13
14     // specify length; default width and height
15     cout << "\n\nThe volume of a box with length 10,\n"
16        << "width 1 and height 1 is: " << boxVolume( 10 );
17
18     // specify length and width; default height
19     cout << "\n\nThe volume of a box with length 10,\n"
20        << "width 5 and height 1 is: " << boxVolume( 10, 5 );
21
```

```
22        // specify all arguments
23        cout << "\n\nThe volume of a box with length 10,\n"
24            << "width 5 and height 2 is: " << boxVolume( 10, 5, 2 )
25            << endl;
26    } // end main
27
28    // function boxVolume calculates the volume of a box
29    int boxVolume( int length, int width, int height )
30    {
31        return length * width * height;
32    } // end function boxVolume
```

```
The default box volume is: 1

The volume of a box with length 10,
width 1 and height 1 is: 10

The volume of a box with length 10,
width 5 and height 1 is: 50

The volume of a box with length 10,
width 5 and height 2 is: 100
```