

Functions with default parameters

- In a function call, the number of actual and formal parameters must be the same
 - C++ relaxes this condition for functions with **default parameters**
- You specify the value of a default parameter when the function name appears for the first time (**e.g., in the prototype**)
- If you do not specify the value of a default parameter, the default value is used
- All default parameters must be the **rightmost parameters** of the function
- In a function call where the function has more than one default parameter and a value to a default parameter is not specified:
 - You must **omit** all of the arguments to its right
- Default values can be constants, global variables, or function calls
 - However, you **cannot** assign a constant value as a default value to a reference parameter
- Consider the following prototype:

```
void funcExp(int x, int y, double t, char z = 'A', int u = 67,  
            char v = 'G', double w = 78.34);
```

- Assume:
 - a, b are int, ch is char, d is double
- Examples of legal calls:

```
funcExp(a, b, d);  
funcExp(a, 15, 34.6, 'B', 87, ch);  
funcExp(b, a, 14.56, 'D');
```

- Examples of illegal calls:

```
funcExp(a, 15, 34.6, 46.7);  
funcExp(b, 25, 48.76, 'D', 4567, 78.34);
```

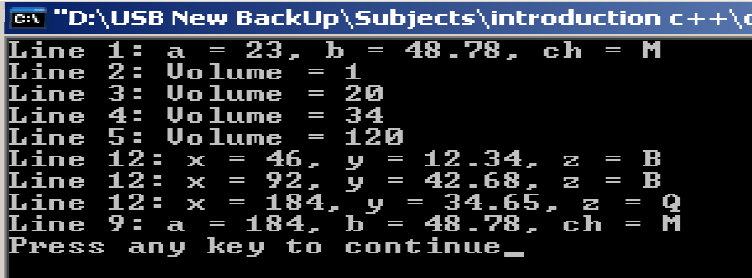
- Examples of illegal function prototypes with default parameters:

```
void funcOne(int x, double z = 23.45, char ch, int u = 45);  
int funcTwo(int length = 1, int width, int height = 1);  
void funcThree(int x, int& y = 16, double z = 34);
```

PROGRAMMING EXAMPLE

```
#include <iostream>
#include <iomanip>
using namespace std;
int volume(int l = 1, int w = 1, int h = 1);
void funcOne(int& x, double y = 12.34, char z = 'B');
int main()
{
    int a = 23;
    double b = 48.78;
    char ch = 'M';
    cout << fixed << showpoint;
    cout << setprecision(2);
    cout << "Line 1: a = " << a << ", b = "
        << b << ", ch = " << ch << endl;           //Line 1
    cout << "Line 2: Volume = " << volume()
        << endl;                                     //Line 2
    cout << "Line 3: Volume = " << volume(5, 4)
        << endl;                                     //Line 3
    cout << "Line 4: Volume = " << volume(34)
        << endl;                                     //Line 4
    cout << "Line 5: Volume = "
        << volume(6, 4, 5) << endl;                 //Line 5
    funcOne(a);                                     //Line 6
    funcOne(a, 42.68);                              //Line 7
    funcOne(a, 34.65, 'Q');                          //Line 8
    cout << "Line 9: a = " << a << ", b = "
        << b << ", ch = " << ch << endl;           //Line 9
    return 0;}
int volume(int l, int w, int h)
{
    return l * w * h;                               //Line 10
}
void funcOne(int& x, double y, char z)
{
    x = 2 * x;                                       //Line 11
    cout << "Line 12: x = " << x << ", y = "
        << y << ", z = " << z << endl;           //Line 12
}
}
```

PROGRAM RESULTS



```
cmd "D:\USB New BackUp\Subjects\introduction c++\c
Line 1: a = 23, b = 48.78, ch = M
Line 2: Volume = 1
Line 3: Volume = 20
Line 4: Volume = 34
Line 5: Volume = 120
Line 12: x = 46, y = 12.34, z = B
Line 12: x = 92, y = 42.68, z = B
Line 12: x = 184, y = 34.65, z = Q
Line 9: a = 184, b = 48.78, ch = M
Press any key to continue_
```