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## Tutorial - Week 10

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**Objectives:** To practice with C++

- Reference function parameters
- Default function parameters
- Function overloading
- Function templates

1. Will this code compile successfully? If your answer is NO, what is the problem and how will you fix it?

```
#include <iostream>
using namespace std;

void showVolume( int length, int width = 1, int height = 1 );

int main()
{
    showVolume( 2, 3, 4 );
    showVolume( 2, 3 );
    showVolume( 2 );
    showVolume( );

    return 0;
}

void showVolume(int length, int width = 1, int height = 1 )
{
    cout << "Volume of a box with \n"
        << "Length = " << length << ", Width = " << endl;
        << "and Height = " << height
        << " is " << length*width*height<< endl;
    return;
}
```

**2. Explain how these three function calls will be interpreted by C++ compiler.**

```
template <typename  
T> T getMax( T p1, T  
p2 )  
{  
    if (p1 < p2) return p2;  
    else return p1;  
}
```

```
double c, a=2.7,  
b=6.9; c = getMax( a,  
b );
```

```
char z, x='J',  
y='A'; z = getMax(  
x, y );
```

```
int ia = 7, ib = 2;  
int v = getMax( ia, ib );
```

**3. You need to implement a C++ function that takes two parameters of type `unsigned char`. It increments them providing that both operations don't cause overflow. The function returns `true` if both values have been incremented or `false` otherwise. How can all values be passed back if only one value can be returned by a function?**

**What is wrong with this function prototype?**

```
bool incrValues( unsigned char& days=0, unsigned char& hours=0 );
```

4. If variables `a`, `b`, and `c` are 504, 302.558, and -12.31, respectively, write a C++ program fragment that will display the line below. Do not display any quoted strings of blanks. Rather, adjust the field widths using `setw` to produce the blanks shown. (For clarity, a ■ denotes a blank space.)

■504■■■■302.56■■■-12.3

5. write a program to sort three numbers in C++. Be sure to write a function called `order` to achieve this. Use two reference parameters in function `order`.
6. What two kinds of parameters does C++ allow functions and operators to have? What is the difference between these two kinds?