Functions

the great time saver

Defining the function

- You define all functions before the main program. This allows the main program to be "aware" of the various functions.
- Example:

```
// Define the function
void drawCircle( )
{
    cout << "      * *     " << endl;
    cout << "   *        *    " << endl;
    cout << "  *          *    " << endl;
    cout << "   *        *    " << endl;
    cout << "      **      " << endl;
}
```

Calling the function

- Now that the function is defined, you can "call it" whenever and how ever many times you wish within your main program (after the int main( ) line of code.
- Example:

```
int main ( )
{
    // Call the function
    drawCircle( ); //Draws a circle
    drawCircle( ); //Draws a circle again
    drawCircle( ); //And again

    return 0;
}
```

Passing Variables

- You can pass variables to a function so that each function call will yield a different result. There are two ways to do this:

- First way

```
// Declares a function that adds two variables passed to it
void add( int a, int b )
{
    cout << "the numbers add to " << a+b << endl;
}
```

- Second way

```
int add( int a, int b )
{
    return( a+b);
}
```

Explanation

- The difference between the two function declarations is that in the first, the result is computed and outputted to the user
- In the second, the result is *returned* by the function and any displaying of information has to be done in the main program
- Notice that when the function returns a value, the function type is not *void* - it must be whatever type of number is being returned (in this case an *int*)

Calling the functions

- Remember, the function call goes inside the main program. Without the function call, nothing would get done.
- for the first way the function call might look like:

```
add( 4, 5);
```

- for the second way the function call might look like:

```
cout << the numbers add to " << add( 4, 5) << endl;
```

Assignment

1) Create a program that uses a function called drawLogo and have it draw a logo multiple times

2) Create a program that uses a function called mult that takes two floats and returns the product of the two numbers

3) Re-do the calculator program using a function for each operation

For more information on functions and other examples point your web browser to the following url:

http://www.cplusplus.com/doc/tutorial/functions.html