

## Chapter 2 - Output

In this chapter you will learn how to write programs that print out info on the screen for the user to see. But before we get stuck in, there are a few things you should understand first.

A *variable* in c++ is something that stores data. Think of it as an empty box into which you can put a value and retrieve it later. But before you use a variable you have to "declare" it. The purpose of declaring a variable is to let the computer know that you are going to use it so it can set aside a bit of memory to store its value. Different types of variables require different amounts of memory.

There are a few different types of variables. For now, you will only use three; "*int*", "*double*" and "*float*".

- "*Int*" is used to declare variables of type integer (i.e. whole numbers) approximately between + or - 32,000. An int takes up 4 bytes of memory.
- If the magnitude of the number you are using is greater then you can use "*double*". This will need more memory than int. A double uses up 8 bytes of memory.
- "*Float*" is used to declare variables of type floating point. This means you can use numbers with decimals in you program, e.g. 3.46 etc. A float requires 4 bytes of memory.

So let's write a program with a variable in it. Copy the following code into your text editor. Save and compile it as 2a

1	#include<iostream.h>
2	
3	int main()
4	{
5	int x;
6	x=10;
7	
8	cout<<"x is "<< x <<endl;
9	
10	return 0;
11	}

**Example 2a**

The output of this program is "x is 10".

Line 5 is the variable declaration. The variable in this case is x.

Line 6 is a statement that gives x the value of 10.

Line 8 prints out the value of x.

Now let's do a little calculation involving 3 variables.

1	#include<iostream.h>
2	
3	int main()
4	{
5	int x,y,z; // Here are the three variables
6	x=10;
7	y=20;
8	z=(x+y);
9	cout<< x << " plus " << y << " equals " << z <<endl;
10	
11	return 0;
12	}

**Example 2b**

This program should print out "10 plus 20 equals 30".

Note that to place a comment after a piece of code you can use two forward slashes.

The compiler will ignore whatever comes after this. For example:

```
//This is a comment
```

To put in a few lines of comment type:

```
/*
Type whatever you
like in here
*/
```

Edit the above program to do subtractions, multiplications and divisions. Even add in more variables.

Try the following program:

1	#include<iostream.h>
2	
3	int main()
4	{
5	int x,y,z;
6	x=20;
7	y=6;
8	z=(x/y);
9	cout<< x <<" divided by "<< y <<" equals "<< z <<endl;
10	
11	return 0;
12	}

**Example 2c**

What answer will you get? 3.33333? No, because the variables are declared as integers, or whole numbers, you will get an integer (i.e. 3) as the answer. If you want a truer answer with a decimal you will have to declare your variables of type float (Remember a floating data type is a decimal number such as 3.14).

1	#include<iostream.h>
2	
3	int main()
4	{
5	float x,y,z;
6	x=20;
7	y=6;
8	z=(x/y);
9	cout<< x <<" divided by " << y <<" is " << z <<endl;
10	
11	return 0;
12	}

### Example 2d

This gives the correct answer of 3.33333. Simple!

Try messing about with this code and do all sorts of calculations with different numbers of variables. These techniques are very useful for people studying subjects such as maths or physics, where you might want to employ a computer to do calculations for you. All you have to do is present the computer with the equation in a way that it understands.