Homework 1 – Basic Pointers

Note: You may find the syntax to accomplish these exercises from lecture demo.

Exercise 1: Follow these steps:

1. Declare:
    a. Int variables num1, num2 and sum
    b. Int* pointer variables xPtr, yPtr and sumPtr
2. Set num1, num2 and sum to 5, 7 and 0 respectively
3. Initialize all pointers to 0 (nullptr)
4. Print values of variables num1, num2 with labels as shown in the required output below:

    Required Output:

```
Num1 = 5
Num2 = 7
```

5. Print the addresses of Num1 and Num2 using Address Operator (&). Required Output (assuming addresses starting from 0x10 for Num1 and so on) is shown below. (Note that addresses will be different on different machines)

    Required Output:

```
Num1 = 5
Num2 = 7
Address of Num1 = 0x10 //(This will be different on your machine)
Address of Num 2 = 0x14//(This will be different on your machine)
```

6. Point xPtr to num1 and yPtr to num2
7. Print values of Num1 and Num2 by dereferencing xPtr and yPtr

    Required Output:

```
Num1 = 5
Num2 = 7
Address of Num1 = 0x10 //(This will be different on your machine)
Address of Num 2 = 0x14//(This will be different on your machine)
*xPtr = 5
*yPtr = 7
```

8. Point sumPtr to sum and print sum by dereferencing sumPtr.

    Required Output:

```
Num1 = 5
Num2 = 7
Address of Num1 = 0x10 //(This will be different on your machine)
Address of Num 2 = 0x14//(This will be different on your machine)
*xPtr = 5
*yPtr = 7
*sumPtr = 0
```

9. Add num1 and num2 using *xPtr and *yPtr and save the result in integer sum
10. Again Print sum using sumPtr

Required Output:

```
Num1 = 5
Num2 = 7
Address of Num1 = 0x10 //(This will be different on your machine)
Address of Num 2 = 0x14//(This will be different on your machine)
*xPtr = 5
*yPtr = 7
*sumPtr = 12
```

11. Print the values of xPtr and yPtr (cout<<"xPtr = "<<xPtr<<endl)

Required Output:

```
Num1 = 5
Num2 = 7
Address of Num1 = 0x10 //(This will be different on your machine)
Address of Num 2 = 0x14//(This will be different on your machine)
*xPtr = 5
*yPtr = 7
*sumPtr = 12
xPtr = 0x10 //This output should be same as address of num1 i.e. &num1
yPtr = 0x14 //This output should be same as address of num2 i.e. &num2
```

Help:

```
cout<<"Num1 = "<<num1<<endl; // Prints Num1 = 5
sum = *xPtr + *yPtr // Add num1 and num2 using *xPtr and *yPtr and save the result in integer sum
```

Exercise 2: Dry run the piece of code given below on paper and verify your result by executing this code on Visual Studio.

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

void main()
{
	int x = 5;
	int y = 7;
	int temp;
	int* xPtr;
	int* yPtr;
	int* tempPtr;

	xPtr = &x;
	yPtr = &y;
	tempPtr = &temp;
```

```
        *tempPtr = *xPtr;
        *xPtr = *yPtr;
        *yPtr = *tempPtr;

        cout<<"x = "<<x<<endl;
        cout<<"y = "<<y<<endl;

        tempPtr = xPtr;
        xPtr = yPtr;
        yPtr = tempPtr;

        cout<<"x = "<<x<<endl;
        cout<<"y = "<<y<<endl;
}
```