**National University of Computer and Emerging Sciences**



**Object Oriented Programming**

**Lab Manual 2**

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# Introduction

1. Introduce int variables x and y and int\* pointer variables p and q. Set x to 2, y to 8, p to the address of x, and q to the address of y. Then print the following information:

(1) The address of x and the value of x.

(2) The value of p and the value of \*p.

(3) The address of y and the value of y.

(4) The value of q and the value of \*q.

(5) The address of p (not its contents!).

(6) The address of q (not its contents!).

1. Declare three integers x, y and sum and three pointers xPtr, yPtr, sumPtr. Point three pointers to their respective variable.

* Take input in x and y using xPtr and yPtr. Do not use direct references i.e. x and y integers
* Add x and y and save the result in sum. Do not use direct references i.e. x, y and sum integers
* Print addition’s result. For example, if user entered x = 5 and y = 9
* your program should print: 5 + 9 = 14. Do not use direct references i.e. x, y and sum integers

**Note**: You have to do all the processing using pointers i.e. indirect references to variables.

# Debugging

Debug the code and fill in the boxes below.

|  |  |
| --- | --- |
| void switchPtr (int \*p,int \*q)  {  int \*temp = p;  p = q;  q = temp;  } | int acceptPtr(int \*p, int \*q)  {  \*p = \*q + 5;  \*q = \*q + 10;  p = q;  \*p = 5 + \*q;  \*q = \*p + 1;  return \*p+1;  } |
| int dontComplicate(int \*p,int \*q,int &a,int &b)  {  a = a+1;  b = b+2;  q = p;  \*p = 3;  \*q = 5;  a = a+4;  b = b+5;  return \*p + \*q;  } | int notVerySimple(int \*ptr1,int \*ptr2,int &a,int &b)  {  \*ptr1 = 1;  \*ptr2 = 5;  a = 4;  b = 3;  return a+b;  } |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **x** | **y** | **z** | **ptr1** | **\*ptr1** | **ptr2** | **\*ptr2** |
| int main()  {  int x = 1,y = 2,z=0; | 1 | 2 | 0 |  |  |  |  |
| int \*ptr1 = &x; | 1 | 2 | 0 | 0x003afdb0 |  |  |  |
| int \*ptr2 = &y; | 1 | 2 | 0 | 0x003afdb0 | 1 | 0x003afda4 | 2 |
| switchPtr(ptr1,ptr2); |  |  | 0 | 0x003afdb0 | 1 |  | 2 |
| z=acceptPtr(ptr1,ptr2); | 7 | 18 | 19 | 0x003afdb0 | 7 | 0x003afda4 | 18 |
| x = 0; y = 1; | 0 | 1 | 19 |  |  |  |  |
| z=dontComplicate(ptr2,ptr1,y,x); | 7 | 9 | 18 |  | 7 |  | 9 |
| z=notVerySimple(ptr1,ptr2,x,y); | 4 | 3 | 7 |  | 4 |  | 3 |
| return 0;  } |  |  |  |  |  |  |  |

# Problems

1. Write a function that receives a pointer to an integer and print the following: Square of integer, cube of integer, half of the integer.
2. Write a function that receives three integer pointers and it initializes these pointers to 3 integers. Write another function that finds the median of these 3 integers using their pointers.
3. Write a C++ function that receives two integer pointers and swap their values without using third variable. Call the function passing the addresses of two integer variables in the main.