National University of Computer and Emerging

Sciences 

Lab Manual 01
Object Oriented Programming

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Objectives

After performing this lab, students shall be able to:

✔ Develop better understanding of pointers
✔ Understand pointer arithmetic
✔ Dynamically allocate and deallocate memory
✔ Access dynamically allocated memory

TASK 1:

Run and understand the output of following program:

```
int x,y;
x=3, y=4;
int * p;
int * q;
p=& x;
q=&y;
cout<< x<<'\t'<<p<<'\t'<<*p<<'\t'<<&p<<'\t'<<&x<<endl;
cout<<y<<'\t'<<q<<'\t'<<*q<<'\t'<<&q<<'\t'<<&y<<endl;
```

TASK 2:

Given two floats x and y (take input from user), write a C++ program that finds their sum using pointers.

For Example:

Input:

Please enter first number: 5.2
Please enter second number: 1.5

Output:

Sum of numbers is: 6.7

TASK 3:

Write a C++ program that creates memory of 1 variable through an integer pointer. Input a number into the created memory and find square, cube and half of the input.
Make sure to clear the memory at the end and there should be no memory

leak. **For Example:**

Input:

Please enter the integer: 8

Output:

Square of numbers is: 64
Cube of numbers is: 512
Half of numbers is: 4

TASK 4:

Write a function that dynamically allocates an array of integers. The function should accept an integer argument indicating the number of elements to allocate. The function should return a pointer to the array.

TASK 5:

Write a program that dynamically allocates an array large enough to hold a user defined number

of test scores. Once all the scores are entered, the array should be passed to a function that sorts them in ascending order. Another function should be called that calculates the average score. The program should display the sorted list of scores and averages with appropriate headings. **Use pointer notation rather than array notation whenever possible.**

TASK 6:

In statistics, the mode of a set of values is the value that occurs most often or with the greatest frequency. Write a function that accepts as arguments the following: A) An array of integers B) An integer that indicates the number of elements in the array The function should determine the mode of the array. That is, it should determine which value in the array occurs most often. The mode is the value the function should return. If the array has no mode (none of the values occur more than once), the function should return −1. (Assume the array will always contain nonnegative values.) **Demonstrate your pointer prowess by using pointer notation instead of array notation in this function.**

END