National University of Computer and Emerging Sciences

Lab Manual

for

Object Oriented Programming

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Section	OOP BSCS-2A
Semester	Spring 2022

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Lab Manual 1

Objectives:

After performing this lab, students shall be able to:

- ✓ Have an improved understanding of pointers.
- ✓ Declaring and Initializing pointers
- ✓ Pointer Operations

Problem 1

A local zoo wants to keep track of how many pounds of food each of its three monkeys eats each day during a typical week. Write a program that stores this information in a two dimensional 3x5 array, where each row represents a different monkey and each column represents a different day of the week. The program should first have the user input the data for each monkey. Then it should create a report that includes the following information: Write the following code and observe the output:

- Average amount of food eaten per day by the whole family of monkeys.
- The least amount of food eaten during the week by any one monkey.
- The greatest amount of food eaten during the week by any one monkey.

Input Validation: Do not accept negative numbers for pounds of food eaten.

Problem 2

Write a program that asks the user to enter an item's wholesale cost and its markup percentage. It should then display the item's retail price.
For example:

- If an item's wholesale cost is 5.00 and its markup percentage is 100%, then the item's retail price is 10.00.
- If an item's wholesale cost is 5.00 and its markup percentage is 50%, then the item's retail price is 7.50.

The program should have a function named calculateRetail that receives the wholesale cost and the markup percentage as arguments and returns the retail price of the item.

Input Validation: Do not accept negative values for either the wholesale cost of the item or the markup percentage.

Problem 3

Write the following code and observe the output:

```
int a=1, b=3,  c=5;
int * p;
int * q;
int *  r;
  p=& a;
  q=& b;
   r=& c;

  cout<< a<<'\t'<<p<<'\t'<<*p<<'\t'<<&p<<'\t'<<&a<<endl;
  cout<<b<<'\t'<<q<<'\t'<<*q<<'\t'<<&q<<'\t'<<&b<<endl;
cout<< c<<'\t'<<r<<'\t'<<*r<<'\t'<<&r<<'\t'<<&c<<endl;
```

Problem 4

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

For Example:

Input:

Please enter first number: 3
Please enter second number: 2

Output:

Sum of numbers is: 5
Difference of numbers is: 1
Product of numbers is: 6
Square of numbers are: 9, 4

Problem 5

Write a C++ program that takes input height and width of rectangle and COMPUTE area using pointers.

Example Input:
Height : 12
Width : 3
Output:
Area: 36

Problem 6

Write a C++ program that finds and prints the mean of following three integers using pointer variables.

```
int a=10;
int b=15;
int c=12;
```

Problem 7

Write a C++ program that takes 3 numbers from user and print largest and smallest number using pointer variables.

Example Input:
Enter three numbers
Num1: 3
Num2: 1
Num3: 5

Output:
Num3 is largest number
Num2 is smallest number