Lab Manual – Classes

Important Note:
- Have an understanding of classes.
✔ Declaring and Initializing classes
✔ getter,setter
✔ constructor default,parameterized
✔access specifier

Task 1

Exercise 1:

- Create a class Date having following private data members:
  Int Day
  Int Month
  Int Year
- Create an object of Date “date1” and run your program

Exercise 2 [Default Constructor]:

- Write a default Constructor of Date that initializes the object to 1st January 1926 and prints “Default Constructor Called” at the start.
- Now run your program and test what date1 prints?

Exercise 3 [Print Function]:

- Implement a function Print in Date class which prints a date in following format: dd/mm/yyyy (e.g.1/1/1926 for date1)
- Print object date1 in your main function and run the program.
- What does it print and how can we initialize the data of date1 at the time of creation?

Exercise 4 [Input Function]:

- Write a function Input in your Date class that takes input from the user to populate a Date object. ·
- Call “date1.Input()” and “date1.Print()” in your driver program and test it.

Exercise 5 [Setters]:

- Create an object xmasDay using default constructor.
- Print xmasDay and see what it prints.
- Write Setters i.e. SetDay, SetMonth and SetYear in your class.
- Now set xmasDay to 25/12/2020 using Setters in main.

Exercise 6 [Getters]:

- Write Getters i.e. GetDay, GetMonth and GetYear in your date class.
- Now print xmasDay using Getters in your Driver program.

Task 2

In ocean navigation, locations are measured in degrees and minutes of latitude and longitude. Thus if you're lying off the mouth of Papeete Harbor in Tahiti, your location is 149 degrees 34.8 minutes west longitude, and 17 degrees 31.5 minutes south latitude. This is written as 149°34.8' W, 17°31.5' S. There are 60 minutes in a degree. (An older system also divided a minute into 60 seconds, but the modern approach is to use decimal minutes instead.) Longitude is measured from 0 to 180 degrees, east or west from Greenwich, England, to the international dateline in the Pacific. Latitude is measured from 0 to 90 degrees, north or south from the equator to the poles.

Create a class angle that includes three member variables: an int for degrees, a float for minutes, and a char for the direction letter (N, S, E, or W). This class can hold either a latitude variable or a longitude variable. Write one member function to obtain an angle value (in degrees and minutes) and a direction from the user, and a second to display the angle value in 179°59.9' E format. Also write a three-argument constructor. Write a main() program that displays an angle initialized with the constructor, and then, within a loop, allows the user to input any angle value, and then displays the value. You can use the hex character constant '\xF8', which usually prints a degree (°) symbol.

Task 3

Imagine a tollbooth at a bridge. Cars passing by the booth are expected to pay a 50 cent toll. Mostly they do, but sometimes a car goes by without paying. The tollbooth keeps track of the number of cars that have gone by, and of the total amount of money collected.

Model this tollbooth with a class called tollBooth. The two data items are a type int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both of these to 0. A member function called payingCar() increments the car total and adds 0.50 to the cash total. Another function, called nopayCar(), increments the car total but adds nothing to the cash total. Finally, a member function called display() displays the two totals. Make appropriate member functions.

Include a program to test this class. This program should allow the user to push one key to count a paying car, and another to count a non paying car. Pushing the Esc key should cause the program to print out the total cars and total cash and then exit.