TUF | THE UNIVERSITY OF FAISALABAD

Object Oriented Programming – Assignment-02

Constructors, Destructor, Static Data members and Functions.

Instructions for Submission **20 Marks**
Submission Date: Tursday, 02-May-2024 12:00 PM.
Submission Guidelines:

- Your code must be properly commented.
- All the steps involved in solution of each question should be written. Just Answers are not required
- This is an individual assignment. **PLAGIARISM IS NOT ACCEPTABLE!** In case of plagiarism you will get **ZERO MARKS** for that question
- Try NOT to copy paste data from your friends, if you want to improve **Programming Skills do it by yourself**.
- Marks will be deducted if the code does not conform to the standards set out in the document **Programming Standards for Assessed Work**.
- Make a simple flowchart then break your flowchart based on input/output or condition /loops
- Your document should contain your **source code** along with **flowchart** of your program.
- Submit your documents **handwritten format** on my desk before time.
- These lines must be in your code before starting programming

```
// File: File Name.cpp
// Date: 02-05-2024
// Name: Your Name (Ex: Muhammad Javed)
// Registration No: Your REG No (Ex: 2018-BS-AI-072)
// Question Statement
```

Problem 1:	

Write a user-defined program to declare a class which stores a complex number. Demonstrate the use of constant objects, constant member function and constant arguments, using this class.

Problem 2:	

Write a class that contain the following attribute

- The name of car
- Direction of car (E, W, N, S)
- The position of car (from imaginary zero point)

The class has fallowing member function

The constructor to be initialize

- Turn function use to change the direction of car to one steps right side (e.g. if the direction is E, Should be change to S and so on)
- Overload the turn function to change the direction to any side directly. It should accept the direction parameter.
- Move function to change the position of car away from zero point. It should accept the distance as parameter.

Problem 3:	

Write a function find(…) that accepts a one-dimensional integer array of size 10 as an argument to the function. Your program then finds the location and value of the largest and second-largest elements in a one-dimensional array. Display answers in main().

Problem 4:	

Write a function arrange(…) that accepts a one-dimensional integer array of size 10 as an argument to the function. The program then shifts negative numbers to the left and positive numbers to the right side of the array.

For example,

Array is

3	-5	1	2	7	0	-15	6	-4	-8

Output (After Deletion):

-5	-15	-4	-8	3	1	2	7	0	6

Problem 5:	

Create a class employee which stores is name, ID and salary of an employee by user input. The ID should be generated upon the creation of object, starting from 1. Include all the constructors and destructor in the class. Create one object using each of the constructors and display it.

Problem 6:	

Write a C++ program for the class vehicle and its drive class water transport, road transport and air transport vehicles. Make suitable data variables and member functions. When you create an object must be count and display total no of object created also create every class objects and access member through the member functions.

Problem 7:	

Implement a C++ class named Employee with the following specifications:

- The class should have private data **members name (string), id (integer),** and **salary (floating-point).**
- Implement a static data member **totalEmployees** to keep track of the total number of employees.
- Implement a static member function **averageSalary()** that calculates and returns the average salary of all employees.
- Provide member functions to set and get the values of **name**, **id**, and **salary**.
- Implement a constructor to initialize the **name**, **id,** and **salary** of an employee.
- Implement a destructor to decrement the **totalEmployees** count when an object is destroyed.

Problem 8:	

(Car Pool Savings Calculator) Research several car-pooling websites. create an application that calculates your daily driving cost, so that you can estimate how much money could be saved by carpooling, which also has other advantages such as reducing carbon emission and reducing traffic congestion. The application should input the following and display the user's cost per day of driving to word:

a) Total miles driven per day.
b) Cost per gallon of gasoline.
c) Average miles per gallon
d) Parking fees per day.
e) Toll per day.