**Name:**

**Advanced Programming in C++**

**Lab Exercise 5/5/2025**

**Class Design**

In this lab you are going to design a program that will simulatethe operation of a 4 pump gas station. Your project will have two classes:

Pump

Station

Pump class private data members:

gallons – keeps track of the number of gallons dispensed by a pump

Pump public methods:

Pump() - constructor

double gallonsSold() – returns the number of gallons purchased from a pump on any day

void resetGallonsSold() – resets the gallons a pump has sold to 0

void purchase(double) – adds the number of gallons purchased on any sale to the gallons data member.

Station class private data members:

myBasePrice – a double that holds the base price of gasoline

grandTotal – a double that holds the total gasoline sold from the gas station

myPumps – vector of Pump objects

Station public methods:

Station() - constructor

double totalSales() – holds the total sales for the station from all pumps

void resetAll() – resets all pumps gallons sold on a day to 0

void closeStation() – closes the station

void fillTank(int, double) – first parameter is pump number and the second parameter is the number of gallons sold.

Method Notes:

Station Constructor

Set base price to 6.89

Reads the amount of previous sales from a disk file storingthat value in grandTotal

Give message that the station is open

Create 4 Pump objects and adds them to myPumps vector

totalSales method

returns the total sales from all pumps

Pump 1 and Pump2 are Full Service and cost 25 cents above the base price

Calls gallonsSold() for each Pump object and adds to total

resetAll method

resets all pumps recorded gallons to 0

Calls the resetGallonsSold() for each Pump object

closeStation Method

Adds total sales for the day (from all pumps) to grandTotal

Report the totalSales for the day

Write the grandTotal to disk file

Report the station closed

Here is an example of a driver program to test the class

#include <iostream>

#include "station.h"

using namespace std;

int main()

{

Station shell;

shell.fillTank(1, 12);

shell.fillTank(2, 21);

shell.fillTank(3, 7);

shell.fillTank(4, 19);

shell.closeStation();

return 0;

}

//Sample Output

//Station is open

//Total sales for this station: $1430.08

//Closing the station

//The total for the day is $414.76

//Station closed

When you have completed this project, submit your source code and a screenshot of your running program.