**Logo

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**CS360L - Programming in C and C++ Lab**

**Lab Assignment #2**

**Due day: 5/31/2022**

**Instruction:**

1. **Push the answer sheets/source code to Github**
2. **Please follow the code style rule like programs on handout.**
3. **Overdue lab assignment submission can’t be accepted.**

**4. Take academic honesty and integrity seriously (Zero Tolerance of Cheating & Plagiarism)**

1. Given a *student* class with the members and methods as follows, write a C++ test program (a.k.a. main function) to display *names*, *courseNum* and grades of *3* students who have appeared in the examination. Declare the class of *name*, *courseNum*. and *grade*. Create an array of class objects. Read and display the contents of the array.

*#include <iostream>*

*using std::cout;*

*using std::cin;*

*#define MAX 10*

*class student {*

*private:*

*char name[30];*

*int courseNum;*

*int total;*

*float perc;*

*public:*

*void getDetails(void); //member function to get student's details*

*void putDetails(void); //member function to print student's details*

*};*

*void student:: getDetails(void) //member function definition, outside of the class*

*{*

*cout << "Enter name: " ;*

*cin >> name;*

*cout << "Enter course number: ";*

*cin >> courseNum;*

*cout << "Enter total grades out of 500: ";*

*cin >> total;*

*perc=(float)total/500\*100;*

*}*

*void student:: putDetails(void) //member function definition, outside of the class*

*{*

*cout << "Student details:\n";*

*cout << "Name:"<< name << ",course Number:" << courseNum << ",Total:" << total << ",Percentage:" << perc;*

*}*

*int main(void){*

*//Write your program here*

*return 0;*

*}*

**Output**

*Enter total number of students: 3*

*Enter details of student 1:*

*Enter name: Karthik*

*Enter course number: 1201*

*Enter total marks out of 500: 456*

*Enter details of student 2:*

*Enter name: Mahesh*

*Enter course number: 1202*

*Enter total marks out of 500: 398*

*Enter details of student 3:*

*Enter name: Kiran*

*Enter course number: 1203*

*Enter total marks out of 500: 456*

*Details of student 1:*

*Student details:*

*Name: Karthik, course Number: 1201, Total: 456, Percentage: 91.2*

*Details of student 2:*

*Student details:*

*Name: Mahesh, course Number: 1202, Total: 398, Percentage:79.6*

*Details of student 3:*

*Student details:*

*Name: Kiran, course Number: 1203, Total: 456, Percentage: 91.2*

1. Complete two methods, *get\_data()* and *print\_data()* within the given class *sample* based on the running results shown as below

*#include<iostream>*

*using std::cout;*

*using std::cin;*

*using std::endl;*

*class sample{*

*private:*

*int a;*

*char b;*

*float c;*

*public:*

*void get\_data(){*

//Write your program here

*}*

*void print\_data(){*

//Write your program here

*}*

*};*

*int main(void){*

*sample s;*

*s.get\_data();*

*s.print\_data();*

*return 0;*

*}*

**Output**

*Enter an integer value:12*

*Enter a character: S*

*Enter a float value: 12.12*

*Values read from keyboard are*

*Integer value: 12*

*character is :S*

*float value is :12.12*

1. Write a class called *Rectangle* that has floating point data members' *length* and *width*. The class has the following member functions: *void setlength(float)* to set the *length* data member; *void setwidth(float)*to set the *width* data member; *float perimeter(void)*to calculate and return the perimeter of the rectangle; *float area(void)*to calculate and return the area of the rectangle; *void show*(*void*)to display the *length* and *width* of the rectangle; *int sameArea(Rectangle)*that has one parameter of type *Rectangle*, and *sameArea* returns *1* if the two *Rectangles* have the same area, otherwiese returns *0* if they don't.
   1. Create *Rectangle* class first
   2. Write *main* function to create two *rectangle* objects. Set the *length* and *width* of the first rectangle to *5* and *2.5*, and set the *length* and *width* of the second rectangle to *5* and *18.9*. Display each *rectangle* and its area and perimeter.
   3. Check whether the two *Rectangles* have the same area and print a message indicating the result. Set the *length* and *width* of the first *rectangle* to *15* and *6.3*. Display each *Rectangle* and its area and perimeter again. Again, verify whether the two *Rectangles* have the same area and print a message indicating the result
2. Create a class called *MusicIns* to contain three methods *void string(void), void wind(void)* and *void perc(void)*. Each of these methods should initialize a member *string* type *instrument* array to contain the following
   1. *Veena, guitar, sitar, sarod* and *mandolin* under *void string(void)* method
   2. *Flute, clarinet, saxophone, nadaswaram* and *piccolo* under *void wind(void)* method
   3. *Table, mridangam, bongos, drums* and *tambour* under *void perc(void)* method

It should also have two methods called *void get(void)* and *void show(void)* to display the contents of the arrays initialized. The *void get(void)* methods must display a menu as follows

1. The values of *instrument* array within *void string(void)* method
2. The values of *instrument* array within *void wind(void)* method
3. The values of *instrument* array within *void perc(void)* method

After that, generate test program *main.cpp* to verifythe above class