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CS360L

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LAB #2

Github link: https://github.com/MynameisKoi/CS360

1.

Source code:

```cpp
#include <iostream>
#include <iomanip>
using std::cout;
using std::cin;
using std::endl;
#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;
}
```

```cpp
void Student:: putDetails(void) //member function definition, outside of the class
{
  cout << "Student details:\n";
  cout << "Name: "<< name << ", course Number: " << courseNum <<
", Total: " << total << ", Percentage: " << std::setprecision(3) << perc;
}

int main(void){
  Student student[30];
  int n, i;
  cout << "Enter total number of students: ";
  cin >> n;

  for (i = 0; i < n; i++){
    cout << "Enter details of student " << i+1 << ":" << endl;
    student[i].getDetails();
    cout << endl;
  }
  cout << endl;

  for (i = 0; i < n; i++){
    cout << "Details of student " << i+1 << ":" << endl;
    student[i].putDetails();
    cout << endl;
  }
  return 0;
}
```

Run program & result:

```
PS D:\VS CODE\C C++\CS360L\Lab2> cd "d:\VS CODE\C C++\CS360L\Lab2\" ; if ($?) { g++ 1.cpp -o
 1 } ; if ($?) { .\1 }
Enter total number of students: 3
Enter details of student 1:
Enter name: Karthik
Enter course number: 1201
Enter total grades out of 500: 456

Enter details of student 2:
Enter name: Mahesh
Enter course number: 1202
Enter total grades out of 500: 398

Enter details of student 3:
Enter name: Kiran
Enter course number: 1203
Enter total grades 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
PS D:\VS CODE\C C++\CS360L\Lab2> []
```

2.

Source code:

```cpp
#include<iostream>
using std::cout;
using std::cin;
using std::endl;
class sample{
  private:
int a;
char b;
float c;

  public:
void get_data(){
```

```cpp
//Write your program here
cout << "Enter an integer value: ";
cin >> a;
cout << "Enter a character: ";
cin >> b;
cout << "Enter a float value: ";
cin >> c;
    }

void print_data(){
//Write your program here
cout << "Values read from keyboard are" << endl;
cout << "Integer value: " << a << endl;
cout << "Character is: " << b << endl;
cout << "Float value is: " << c << endl;
    }
};
int main(void){
    sample s;
    s.get_data();
    s.print_data();

    return 0;
}
```

Run program & result:

```
PS D:\VS CODE\C C++\CS360L\Lab2> cd "d:\VS CODE\C C++\CS360L\Lab2\" ; if ($?) { g++ 2.cpp -o
 2 } ; if ($?) { .\2 }
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
PS D:\VS CODE\C C++\CS360L\Lab2> 
```

3.

a.

Source code:

```cpp
#include<iostream>
using std::cout;
using std::cin;
using std::endl;
class Rectangle{
  private:
float length, width, a, p;

  public:
void setlength(float){
cout << "Enter length: ";
cin >> length;
    }
void setwidth(float){
cout << "Enter width: ";
cin >> width;
    }
float perimeter(void){
p = (length + width) * 2;
return p;
    }
float area(void){
a = length * width;
return a;
    }
void show(void){
cout << "Length of the rectangle: " << length << endl;
cout << "Width of the rectangle: " << width << endl;
    }
int sameArea(Rectangle r1, Rectangle r2){
    if (r1.a = r2.a){
        return 1;
    }
    else {return 0;}
}
};

int main(void){
  Rectangle r1, r2;
  r1.setlength(5);
  r1.setwidth(2.5);
  cout << "Perimeter: " << r1.perimeter() << endl;
  cout << "Area: " << r1.area() << endl;
  r2.setlength(5);
  r2.setwidth(18.9);
```

```
    cout << "Perimeter: " << r2.perimeter() << endl;
    cout << "Area: " << r2.area() << endl;

    cout << "Output for 'sameArea' function: " << r1.sameArea(r1,r2) << endl;
    r1.setlength(15);
    r1.setwidth(6.3);
    cout << "Output for 'sameArea' function: " << r1.sameArea(r1,r2) << endl;
    return 0;
}
```

b.

Source code cut from (a):

```
Rectangle r1, r2;
r1.setlength(5);
r1.setwidth(2.5);
cout << "Perimeter: " << r1.perimeter() << endl;
cout << "Area: " << r1.area() << endl;
r2.setlength(5);
r2.setwidth(18.9);
cout << "Perimeter: " << r2.perimeter() << endl;
cout << "Area: " << r2.area() << endl;
```

Run program & result:

```
Enter length: 5
Enter width: 2.5
Perimeter: 15
Area: 12.5
Enter length: 5
Enter width: 18.9
Perimeter: 47.8
Area: 94.5
```

c.

Source code cut from (a):

```
cout << "Output for 'sameArea' function: " << r1.sameArea(r1,r2) << endl;
r1.setlength(15);
r1.setwidth(6.3);
cout << "Output for 'sameArea' function: " << r1.sameArea(r1,r2) << endl;
```

Run program & result:

```
Output for 'sameArea' function: 0
Enter length: 15
Enter width: 6.3
Output for 'sameArea' function: 1_
```

4.

Source code:

```cpp
#include<iostream>
#include<list>
using std::cout;
using std::cin;
using std::endl;
using std::string;

class MusicIns {
  private:
string string_inst[5], wind_inst[5], perc_inst[5];
int n;

  public:
void string_ins(void){
string_inst[0] = "veena";
string_inst[1] = "guitar";
string_inst[2] = "sitar";
string_inst[3] = "sarod";
string_inst[4] = "mandolin";
    }
void wind_ins(void){
wind_inst[0] = "flute";
wind_inst[1] = "clarinet";
wind_inst[2] = "saxophone";
```

```cpp
wind_inst[3] = "nadaswaram";
wind_inst[4] = "piccolo";
    }
void perc_ins(void){
perc_inst[0] = "table";
perc_inst[1] = "mridangam";
perc_inst[2] = "bongos";
perc_inst[3] = "drums";
perc_inst[4] = "tambour";
    }
void show(void)
{
    if (n == 1) {for (int i = 0; i < 5; i++) {cout << string_inst[i] << ", ";}}
    if (n == 2) {for (int i = 0; i < 5; i++) {cout << wind_inst[i] << ", ";}}
    if (n == 3) {for (int i = 0; i < 5; i++) {cout << perc_inst[i] << ", ";}}
    }
void get(void){
cout << "1) String instrument" << endl;
cout << "2) Wind instrument" << endl;
cout << "3) Perc instrument" << endl;
cout << "Choose a number: ";
cin >> n;
cout << "Instrument array: ";
return show();
}
};

int main(void){
    MusicIns ins;
    ins.string_ins();
    ins.wind_ins();
    ins.perc_ins();
    ins.get();
}
```

Run program & result:

```
PS D:\VS CODE\C C++\CS360L\Lab2> cd "d:\VS CODE\C C++\CS360L\Lab2\" ; if ($?) { g++ 4.cpp -o
 4 } ; if ($?) { .\4 }
1) String instrument
2) Wind instrument
3) Perc instrument
Choose a number: 1
Instrument array: veena, guitar, cd "d:\VS CODE\C C++\CS360L\Lab2\" ; if ($?) { g++ 4.cpp -o
 4 } ; if ($?) { .\4 }360L\Lab2>
1) String instrument
2) Wind instrument
3) Perc instrument
Choose a number: 2
Instrument array: flute, clarinet, saxophone, nadaswaram, piccolo,
PS D:\VS CODE\C C++\CS360L\Lab2> cd "d:\VS CODE\C C++\CS360L\Lab2\" ; if ($?) { g++ 4.cpp -o
 4 } ; if ($?) { .\4 }
1) String instrument
2) Wind instrument
3) Perc instrument
Choose a number: 3
Instrument array: table, mridangam, bongos, drums, tambour,
PS D:\VS CODE\C C++\CS360L\Lab2>
```