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A23

CSSE

Question 1

```
/*1) Create a class student which stores name, roll number and age of a student.  
Derive a class test from student class, which stores marks in 5 subjects.  
Input and display the details of a student.*/
```

```
#include <iostream>  
#include <string.h>  
using namespace std;  
  
class student  
{  
private:  
public:  
    string name;  
    int roll;  
    int age;  
};  
  
class test:public student  
{  
private:  
    int arr[5];  
    int num;  
public:  
    test()  
    {  
        cout<<"Enter name"<<endl;  
        cin>>name;  
        cout<<"Enter roll number"<<endl;  
        cin>>roll;  
        cout<<"Enter age"<<endl;  
        cin>>age;  
        cout<<"enter marks of 5 subjects:"<<endl;  
        for (int i = 0; i < 5; i++)  
        {  
            cin>>num;  
            arr[i]=num;  
        }  
    }  
    void print()  
    {  
        cout<<"Name: "<<name<<endl;  
        cout<<"Roll number: "<<roll<<endl;  
        cout<<"Age: "<<age<<endl;  
        cout<<"Marks: "<<endl;  
        for (int i = 0; i < 5; i++)  
        {  
            cout<<arr[i]<<endl;  
        }  
    }  
};  
int main()  
{  
    test t;  
    t.print();  
}
```

Output

```
PS C:\Users\KIIT\Documents\coding> cd "c:\Users\KIIT\Documents\coding\3rd semester\OOP lab\class 7\" ; if ($?) { g++ class7_q1.cpp -o class7_q1 } ; if ($?) { .\class7_q1 }
Enter name
agnim
Enter roll number
2028083
Enter age
20
enter marks of 5 subjects:
90
95
94
93
92
Name: agnim
Roll number: 2028083
Age: 20
Marks:
90
95
94
93
92
PS C:\Users\KIIT\Documents\coding\3rd semester\OOP lab\class 7> █
```

Question 2

/*Extend the program 1 to derive a class from result from classs 'test' which includes member function to calculate total marks and percentage of a student.
Input the data for astudent and display its total marks and percentage.*/

```
#include <iostream>
#include <string.h>
using namespace std;

class student
{
private:
public:
    string name;
    int roll;
    int age;
};

class test: virtual public student
{
private:
    int arr[5];
    int num;
public:
    int sum=0;
    test()
    {
        cout<<"Enter name"<<endl;
        cin>>name;
        cout<<"Enter roll number"<<endl;
        cin>>roll;
        cout<<"Enter age"<<endl;
        cin>>age;
        cout<<"enter marks of 5 subjects:"<<endl;
        for (int i = 0; i < 5; i++)
        {
            cin>>num;
            arr[i]=num;
        }
    }
};
```

```

4         for (int i = 0; i < 5; i++)
5         {
6             cin>>num;
7             arr[i]=num;
8         }
9     }
10    void print()
11    {
12        cout<<"Name: "<<name<<endl;
13        cout<<"Roll number: "<<roll<<endl;
14        cout<<"Age: "<<age<<endl;
15        cout<<"Marks: "<<endl;
16        for (int i = 0; i < 5; i++)
17        {
18            cout<<arr[i]<<endl;
19            sum+=arr[i];
20        }
21    }
22    };
23
24    class result:virtual public student, public test
25    {
26    public:
27        void display()
28        {
29            cout<<"Total marks of the student: "<<sum<<endl;
30            int p=(sum*100)/500;
31            cout<<"Total percentage of the student: "<<p<<endl;
32        }
33    };
34
35    int main()
36    {
37        result t;
38        t.print();
39        t.display();
40    }

```

Output

```
PS C:\Users\KIIT\Documents\coding> cd "c:\Users\KIIT\Documents\coding\3rd semester\OOP lab\class 7\" ; if ($?) { g++ class7_q2.cpp -o class7_q2 } ; if ($?) { .\class7_q2 }
Enter name
agnim
Enter roll number
2028083
Enter age
20
enter marks of 5 subjects:
99
98
97
96
95
Name: agnim
Roll number: 2028083
Age: 20
Marks:
99
98
97
96
95
Total marks of the student: 485
Total percentage of the student: 97
PS C:\Users\KIIT\Documents\coding\3rd semester\OOP lab\class 7> █
```

Question 3

/*Extend the program 2. to include a class sports, which stores the marks in sports activities. Derive the result class from the classes 'test' and 'sports'. Calculate the total marks and percentage of a student. */

```
#include <iostream>
#include <string.h>
using namespace std;

class student
{
private:
public:
    string name;
    int roll;
    int age;
};

class test: virtual public student
{
private:
    int num;
public:
    int arr[6];
    int sum=0;
    test()
    {
        cout<<"Enter name"<<endl;
        cin>>name;
        cout<<"Enter roll number"<<endl;
        cin>>roll;
        cout<<"Enter age"<<endl;
        cin>>age;
        cout<<"enter marks of 5 subjects:"<<endl;
        for (int i = 0; i < 5; i++)
        {
            cin>>num;
            arr[i]=num;
            sum+=arr[i];
        }
    }
};
```

```

        for (int i = 0; i < 5; i++)
        {
            cin>>num;
            arr[i]=num;
            sum+=arr[i];
        }
    }

};

class sports:virtual public test
{
public:
    sports()
    {
        cout<<"Enter marks for sports: "<<endl;
        cin>>arr[5];
        sum+=arr[5];
    }
    void print()
    {
        cout<<"Name: "<<name<<endl;
        cout<<"Roll number: "<<roll<<endl;
        cout<<"Age: "<<age<<endl;
        cout<<"Marks: "<<endl;
        for (int i = 0; i < 6; i++)
        {
            cout<<arr[i]<<endl;
        }
    }
};

class result:public sports , virtual public test
{
public:
    void display()
    {
        cout<<"Total marks of the student: "<<sum<<endl;
        int p=(sum*100)/600;
        cout<<"Total percentage of the student: "<<p<<endl;
    }
};

int main()
{
    result t;
    t.print();
    t.display();
}

```

Output

```
PS C:\Users\KIIT\Documents\coding\3rd semister\
OOP lab\class 7> cd "c:\Users\KIIT\Documents\co
ding\3rd semister\OOP lab\class 7\" ; if ($?) {
  g++ class7_q3.cpp -o class7_q3 } ; if ($?) { .
\class7_q3 }
Enter name
Agnim
Enter roll number
2028083
Enter age
20
enter marks of 5 subjects:
99
96
95
94
93
Enter marks for sports:
92
Name: Agnim
Roll number: 2028083
Age: 20
Marks:
99
96
95
94
93
92
Total marks of the student: 569
Total percentage of the student: 94
PS C:\Users\KIIT\Documents\coding\3rd semister\
OOP lab\class 7> █
```


Question 4

/*Create a class 'shape'. Derive three classes from it: Circle, Triangle and Rectangle. Include the relevant data members and functions in all the classes. Find the area of each shape and display it.*/

```
#include <iostream>
using namespace std;

class Shape
{
public:
    int a, b, r;
    void get_data(int n,int m)
    {
        a= n;    b = m;
    }
    void get_data(int r)
    {
        this->r= r;
    }
};

class Circle : public Shape
{
public:
    int circle_area()
    {
        int result = (22*r*r)/7;
        return result;
    }
};

class Rectangle : public Shape
{
public:
    int rect_area()
    {
        int result = a*b;
        return result;
    }
};
```

```

class Triangle : public Shape
{
    public:
    int triangle_area()
    {
        float result = 0.5*a*b;
        return result;
    }
};

main(){
    Rectangle r;
    Triangle t;
    Circle c;
    int length,breadth,base,height, radius;
    cout << "Enter the radius of a circle: ";
    cin>>radius;
    c.get_data(radius);
    int m = c.circle_area();
    cout << "Area of the circle is : " <<m<<endl ;
    cout << "Enter the base and height of the triangle: " ;
    cin>>base>>height;
    t.get_data(base,height);
    float n = t.triangle_area();
    cout <<"Area of the triangle is : " << n<<endl;
    cout << "Enter the length and breath of a rectangle: ";
    cin>>length>>breadth;
    r.get_data(length, breadth);
    int p = r.rect_area();
    cout << "Area of the rectangle is : " <<p<<endl ;
    return 0;
}

```

Output

```

PS C:\Users\KIIT\Documents\coding> cd "c:\Users\KIIT\Documents\coding\3rd semester\OOP lab\class 7\" ; if ($?) { g++ class7_q4.cpp -o class7_q4 } ; if ($?) { .\class7_q4 }
Enter the radius of a circle: 7
Area of the circle is : 154
Enter the base and height of the triangle: 20
2
Area of the triangle is : 20
Enter the length and breath of a rectangle: 20
40
Area of the rectangle is : 800
PS C:\Users\KIIT\Documents\coding\3rd semester\OOP lab\class 7> █

```