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	**Dr D Y Patil Pratishthan's** **D.Y. Patil Institute of Engineering, Management and Research, Akurdi, Pune**	DI No.:
Academic Year: 2021-22	**OOPAssignment : 2**	
Term – I	**Department : Computer Engineering** **Class: SE**	**Date of Preparation :** **30/09/2021**

Note : Make use of constructors , destructors wherever necessary. **PART A & PART B are compulsory**

Part A

1. C++ Program to Compare Two Strings **using operator overloading** (CO3, PO3,PO5)

Program

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

class String
{
        char str[20];
        public:
          void getdata()
        {
             gets(str);
```

```
        }

         int operator ==(String s)
        {
               if(!strcmp(str,s.str))
                return 1;

                return 0;
        }
};

int main()
{
        String s1,s2;

        cout<<"Enter first string - ";
        s1.getdata();
        cout<<"\nEnter second string - ";
        s2.getdata();
        if(s1==s2)
        {
            cout<<"\nStrigs are Equal\n";
        }
        else
        {
            cout<<"\nStrings are Not Equal\n";
        }

        return 0;
}
```

Output

Enter first string - Hello

Enter second string - Hello

Strings are Equal
PS C:\Users\Admin\OneDrive\C++\OOPS_Assignment> cd
"c:\Users\Admin\OneDrive\C++\OOPS_Assignment\" ; if ($?) { g++ new_assignment2-1.cpp -o

```
new_assignment2-1 } ; if ($?) { .\new_assignment2-1 }
Enter first string - Hello World

Enter second string - Hello Myworld

Strings are Not Equal
PS C:\Users\Admin\OneDrive\C++\OOPS_Assignment>
```

2. C++ program to find area of square,rectangle,circle and triangle **using pure virtual function**

Program

```
#include<iostream>
#include<conio.h>
using namespace std;
class shape
{
        public:
    virtual void area()=0;
};
class circle: public shape
{
   float r;
   public:
    void area()
    {
        cout<<"To calculate area of circle ";
        cout<<"\nEnter radius -";
        cin>>r;
        cout<<"\nArea of circle = "<<(2.146*r*r);
    }
};
class rectangle: public shape
{
    int l,b;
    public:
   void area()
    {
        cout<<"\nTo calculate area of Rectangle ";
        cout<<"\nEnter length - ";
```

```
        cin>>l;
        cout<<"\nEnter breadth - ";
        cin>>b;
        cout<<"\nArea of rectangle = "<<l*b;
    }
};
class triangle: public shape
{

    int h,b;
        float a;
    public:
        void area()
        {
             cout<<"\nTo calculate area of triangle ";
             cout<<"\nEnter height - ";
             cin>>h;
             cout<<"\nEnter breadth - ";
             cin>>b;
             a=0.5*h*b;
             cout<<"\nArea of triangle = "<<a;
        }
};
int main()
{
   circle c;
   c.area();
   rectangle r;
   r.area();
   triangle t;
   t.area();
   getch();
   return(0);
}
```

Output

PS C:\Users\Admin\OneDrive\C++> cd

"c:\Users\Admin\OneDrive\C++\OOPS_Assignment\" ; if ($?) { g++ new_assignment2-2.cpp -o new_assignment2-2 } ; if ($?) { .\new_assignment2-2 }

To calculate area of circle
Enter radius -5
Area of circle = 53.65

To calculate area of Rectangle
Enter length - 7
Enter breadth - 6
Area of rectangle = 42

To calculate area of triangle
Enter height - 8
Enter breadth - 2
Area of triangle = 8

3. C++ program to find volume of cube, cylinder, sphere **by function overloading** (CO3, PO3,PO5)

Program

```
#include <iostream>
using namespace std;
float vol(int, int);
float vol(float);
int vol(int);

int main()
{
    int r, h, a;
    float r1;
    cout << "Enter radius and height of a cylinder:";
    cin >> r >> h;
    cout << "Enter side of cube:";
    cin >> a;
    cout << "Enter radius of sphere: ";
```

```
    cin >> r1;
    cout << "Volume of cylinder is " << vol(r, h);
    cout << "\nVolume of cube is " << vol(a);
    cout << "\nVolume of sphere is " << vol(r1);
    return 0;
}
float vol(int r, int h)
{
    return (3.14 * r * r * h);
}
float vol(float r1)
{
    return ((4 * 3.14 * r1 * r1 * r1) / 3);
}
int vol(int a)
{
    return (a * a * a);
}
```

Output

```
PS C:\Users\Admin\OneDrive\C++\OOPS_Assignment> cd "c:\Users\Admin\OneDrive\C++\OOPS_Assignment\" ; if ($?) { g++ new_assignment2-3.cpp -o new_assignment2-3 } ; if ($?) { .\new_assignment2-3 }
Enter radius and height of a cylinder:
8
9
Enter side of cube:7
Enter radius of sphere: 6
Volume of cylinder is 1808.64
Volume of cube is 343
Volume of sphere is 904.32
PS C:\Users\Admin\OneDrive\C++\OOPS_Assignment>
```

Part B: Competitive Programming Question

The given code defines two classes HotelRoom and HotelApartment denoting respectively a standard hotel room and a hotel apartment. An instance of any of these classes has two parameters: bedrooms and bathrooms denoting respectively the number of bedrooms and the number of

bathrooms in the room.

The prices of a standard hotel room and hotel apartment are given as:

- Hotel Room: 50 *bedrooms + 100 *bath rooms .
- Hotel Apartment: The price of a standard room with the same number bedrooms and bathrooms plus 100 .

For example, if a standard room costs 200 , then an apartment with the same number of bedrooms and bathrooms costs 300 .

In hotel's codebase, there is a piece of code reading the list of rooms booked for today and calculates the total profit for the hotel. However, sometimes calculated profits are lower than they should be.

Debug the existing HotelRoom and HotelApartment classes' implementations so that the existing code computing the total profit returns a correct profit. **Make use of Inheritance concept** (CO2, PO3,PO5,PO12)

Input Format

In the first line, there is a single integer ‘n’ denoting the number of rooms booked for today.

After that ‘n’ lines follow. Each of these lines begins with a room_type which is either standard or apartment, and is followed by the number of bedrooms and the number of bathrooms in this room.

Output Format

It calculates the total profit by iterating through the vector of all rooms read from the input. **Sample Input**

2
standard 3 1

apartment 1 1

Sample Output

500

In the sample we have one standard room with bedrooms and bathroom, and one apartment with one bedrooms and bathroom. The price for the room is 3*50+100=250. The price for the apartment is 50+100+100=250 . Thus the hotel profit is 250+250=500 as the sum of prices of both rooms.

Program

```
#include <iostream>
using namespace std;
class Hotelroom
{
    int bedrooms, bathrooms;
    float friend getdata();

public:
    float room_profit(int a, int b)
    {
        return ((a*50)+(b*100));
    }
};
class Hotelapartment : public Hotelroom
{
    int bedrooms, bathrooms;
    float friend getdata();

public:
    float apartment_profit(int c, int d)
    {
        return ((c*50)+(d*100)+100);
    }
};
```

```
float getdata()
{
    string s;
    int bedrooms, bathrooms;
    cin >> s >> bedrooms >> bathrooms;
    if (s == "standard")
    {
        Hotelroom p;
        return p.room_profit(bedrooms,bathrooms) ;

    }
    if (s == "apartment")
    {
        Hotelapartment q;
        return q.apartment_profit(bedrooms,bathrooms);
    }
    else
    {
        cout << "Please check your input !!";
        return 0.0;
    }
}
int main()
{
    int n , total_profit=0;
    cin>>n;
    for (int i = 0; i < n; i++)
    {
        float q=getdata();
        total_profit=total_profit+ q;
```

```
    }
    cout<<total_profit;
    return 0;
}
```

Output

```
PS C:\Users\Admin\OneDrive\C++\OOPS_Assignment> cd
"c:\Users\Admin\OneDrive\C++\OOPS_Assignment\" ; if ($?) { g++ myRoom.cpp -o myRoom } ; if ($?) {
.\myRoom }
2
standard 3 1
apartment 1 1
500
PS C:\Users\Admin\OneDrive\C++\OOPS_Assignment>
```