Assignment 33

1. Create a base class called shape. Use this class to store two double type values that

could be used to compute the area of figures. Derive two specific classes called

triangle and rectangle from the base shape. Add to the base class, a member

function get\_data() to initialise base class data members and another member

function display\_area() to compute and display the area of figures. Make

display\_area() as a virtual function and redefine this function in the derived classes to

suit their requirements.

Using these three classes, design a program that will accept dimensions of a

triangle or a rectangle interactively, and display the area.

Remember the two values given as input will be treated as lengths of two sides in

the case of rectangles, and as base and height in the case of the triangles, and used

as follows:

Area of rectangle = x \* y Area of triangle = 1/2 \* x \* y

#include<iostream>

using namespace std;

class shape

{

    double x;

    double y;

    public:

        shape()

        {

        }

        void set\_value(double l, double b)

        {

            x=l;

            y=b;

        }

        double get\_x()

        {

            return x;

        }

        double get\_y()

        {

            return y;

        }

        virtual void display\_area()=0;// pure virtual function

};

class rectangle : public shape

{

    public:

        void display\_area()

        {

            cout<<" area of rectangle is "<< get\_x() \* get\_y()<<endl;

        }

};

class triangle : public shape

{

    public:

        void display\_area()

        {

            cout<<" area of triangle is "<< 0.5 \* get\_x() \* get\_y()<<endl;

        }

};

int main()

{

    rectangle r;

    r.set\_value(3,4);

    r.display\_area();

    triangle tri;

    tri.set\_value(2,4);

    tri.display\_area();

    return 0;

}

Output:

cd "c:\Users\tusha\Documents\coadind\assignment33.cpp\" ; if ($?) { g++ problem01.cpp -o problem01 } ; if ($?) { .\problem01 }

area of rectangle is 12

area of triangle is 4

2. Extend the above program to display the area of circles. This requires the addition of

a new derived class 'circle' that computes the area of a circle. Remember, for a circle

we need only one value, its radius, but the get\_data() function in the base class

requires two values to be passed. (Hint: Make the second argument of get\_data()

function as a default one with zero value.)

#include<iostream>

using namespace std;

class shape

{

    double x;

    double y;

    public:

        shape()

        {

        }

        void set\_value(double l, double b=0)

        {

            x=l;

            y=b;

        }

        double get\_x()

        {

            return x;

        }

        double get\_y()

        {

            return y;

        }

        virtual void display\_area()=0;// pure virtual function

};

class rectangle : public shape

{

    public:

        void display\_area()

        {

            cout<<" area of rectangle is "<< get\_x() \* get\_y()<<endl;

        }

};

class triangle : public shape

{

    public:

        void display\_area()

        {

            cout<<" area of triangle is "<< 0.5 \* get\_x() \* get\_y()<<endl;

        }

};

class circle : public shape

{

    public:

        void display\_area()

        {

            cout<<" area of circle is "<< 3.1415 \* get\_x()\*get\_x()<<endl;

        }

};

int main()

{

    rectangle r;

    r.set\_value(3,4);

    r.display\_area();

    triangle tri;

    tri.set\_value(2,4);

    tri.display\_area();

    circle c;

    c.set\_value(10);

    c.display\_area();

    return 0;

}

cd "c:\Users\tusha\Documents\coadind\assignment33.cpp\" ; if ($?) { g++ problem01.cpp -o problem01 } ; if ($?) { .\problem01 }

area of rectangle is 12

area of triangle is 4

area of circle is 314.15

PS C:\Users\tusha\Documents\coadind\assignment33.cpp>

3. Using the concept of pointers, write a function that swaps the private data values of

two objects of the same class type.

#include<iostream>

using namespace std;

class A

{

    int x;

    public:

        A()

        {

        }

        A(int x)

        {

            this->x=x;

        }

        void swap( A \* num)

        {

            int t;

            t = num->x;

            num->x = x;

            x = t;

        }

        void display()

        {

            cout<<" value : "<<x;

        }

};

int main()

{

    A a(5),b(6);

    a.display();

    b.display();

    a.swap(&b);

    cout<<"\n ----------------------"<<endl;

    a.display();

    b.display();

    return 0;

}

value : 5 value : 6

----------------------

value : 6 value : 5

PS C:\Users\tusha\Documents\coadind\assignment33.cpp>

4. Create a base class called shape. Use this class to store 2 double type values that

could be used to compute the area of figures. Derive 2 specific classes called triangle

and rectangle from the base shape. Add to the base class a member function

get\_data() to initialise base class data members and another member function

display\_area() to compute and display the area of figures. Make display\_area() as a

virtual function and redefine this function in derived classes to suit their requirements.

Using these 3 classes, design a program that will accept the dimensions of the

shapes interactively and display area.

#include<iostream>

using namespace std;

class shape

{

    protected:

        double length1;

        double length2;

    public:

        void set\_value(double length1, double length2 =0)

        {

            this->length1=length1;

            this->length2 = length2;

        }

        virtual void display()=0;

};

class rectangle : public shape

{

public:

    void display()

    {

        cout<<"the area of rectangle is "<<length1 \* length2<<endl;

    }

};

class triangle : public shape

{

private:

public:

   void display()

    {

        cout<<"the area of triangle is "<<length1 \* length2/2<<endl;

    }

};

int main()

{

    rectangle r;

    r.set\_value(4,5);

    triangle t;

    t.set\_value(2,4);

    r.display();

    t.display();

    return 0;

}

Output:

the area of rectangle is 20

the area of triangle is 4

PS C:\Users\tusha\Documents\coadind\assignment33.cpp>