**Gr no 21810819**

**Assignment no: 3**

**Problem statement:**

Implement a program to create a base class called shape. Use this class to store two double types values that could be used to compute the area of figures. Derives two specific classes called function get\_data() to initialize base class data members and another member function display\_area() to compute and display the area of figures. Make classes to suit their requirements. Using these three classes, design a program that will accept dimension of a triangle or rectangle interactively, and display the area. Remember the two values given as input will be treated as length of two sides in case of rectangles, and as base and height in case of triangles, and used as follows:

Area of rectangle=x\*y;

Area of triangle=1/2\*(x\*y);

**Aim of Assignment:**

Implement one base class known as shape & two derived classes known as triangle and rectangle.

Calculate the area of figures through inheritance.

**Description:**

Program contain one base class named as shape which contain two double types values. Two classes are derived from base class named as triangle and rectangle . Derived class accept the values through get\_data() function and calculate the area and display it through display\_area() function. This is possible by using inheritance.

OOP concept used:

1. Inheritance:

The capability of class to derive properties and characteristics from another class is called inheritance.

Base class:

The class whose properties are inherited by sub class or another class ,this class is known as base class or super class.

Derived class:

The class which inherit the properties of another class is known as derived class or sub class.

**Code :**

#include<iostream>

using namespace std;

class Shape // base class

{

protected:

double a,b;

public:

void get\_data ()

{

cin>>a>>b;

}

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

};

// Implementing hirachical inheritance

class Triangle:public Shape // derive class1

{

public:

void display\_area ()

{

cout<<endl<<"Area of triangle is "<<0.5\*a\*b<<endl; // calculating area of triangle

}

};

class Rectangle:public Shape // derive class2

{

public:

void display\_area ()

{

cout<<endl<<"Area of rectangle is "<<a\*b<<endl; // calculating area of rectangle

}

};

int main()

{

Triangle t; // derive class1 object

Shape \*st = &t; // Giving reference to base class object of derive class object

Rectangle r; // derive class2 object

Shape \*sr = &r; // Reference of object is given

int c;

cout<<" AREA CALCULATION";

cout<<endl<<"1)Area of Triangle"<<endl<<"2)Area of Rectangle"<<endl;

cout<<"Enter Your choice " ;

cin>>c;

switch(c)

{

case 1:

cout<<"Enter Height and Base ";

st->get\_data();

st->display\_area();

break;

case 2:

cout<<"Enter length and breadth ";

sr->get\_data();

sr->display\_area();

break;

default:

cout<<"Invalid choice "<<endl;

}

return 0;

}

**Conclusion:**

Area of triangle and rectangle are calculated through inheritance. Thus, inheritance are implemented successfully.

**Screenshots:**

