CHANDIGARH UNIVERSITY

UIC

OOPs LAB PRACTICAL

Practical No. – 8

Name :- Amar Preet Das

Section :- 19BCA2-A

Group :- II

UID :- 19BCA1129

Submitted to:- Prof. Dr Kirti Walia

Practical 8)

WAP to evaluate the area of a particular shape as entered by the user at run time, where shape is the base class in which function area is declared. Various shape classes should be defined derived from shape class and accordingly the area function should be defined. User will give its choice as per the menu to calculate the area.

Ans)

Code :-

```
#include <iostream>

using namespace std;

float pi=3.14;      //Use of global variable

class shape{      //base class

        protected:          //protected members can be inherited

                int a,b;

        public:

    virtual void area()=0;      //using pure virtual function ( only declaration in base class )


};

class square: public shape{          //1st  derived class

        protected:

                int r;

        public:

                void area(){          //defining pure virtual function in base class

                        cout<<"Enter side of square: "<<endl;

                        cin>>b;

                        r=b*b;

                        cout<<"Area of square is: "<<r;

                }

};

class circle: public shape{          //2nd  derived class

        protected:

                float r;
```

```
        public:
                void area(){       //defining pure virtual function in base class
                        cout<<"Enter radius of circle: "<<endl;
                        cin>>r;
                        cout<<"Area of circle is: "<<pi*r*r;
                }
};
class rectangle: public shape{                          //3rd  derived class
        protected:
                int r;
        public:
                void area(){        //defining pure virtual function in base class
                        cout<<"Enter length and breadth of rectangle: "<<endl;
                        cin>>a>>b;
                        r=a*b;
                        cout<<"Area of rectangle is: "<<r;
                }
};
class triangle: public shape{              //4th  derived class
        protected:
                float r;
        public:
                void area(){           //defining pure virtual function in base class
                        cout<<"Enter base & height of triangle: "<<endl;
                        cin>>a>>b;
                        r=0.5*a*b;
                        cout<<"Area of triangle is: "<<r;
                }
};
class trapezium: public shape{     //5th derived class
```

```
        protected:
                float y;
                int r;
        public:
                void area(){        //defining pure virtual function in base class
                        cout<<"Enter length of two parallel sides of trapezium: "<<endl;
                        cin>>a>>b;
                        cout<<"Enter value of distance between these sides: "<<endl;
                        cin>>r;
                        y = 0.5*(a+b)*r;
                        cout<<"Area of trapezium is: "<<y;
                }
};
int main() {
        int q;
        cout<<"Enter the shape whose area you want to calculate: "<<endl;
        cout<<"List of shapes available: Enter Shape no."<<endl<<"1=square, 2=circle, 3=rectangle, 4=  triangle, 5=trapezium: \n";
        cin>>q;
   //using nested if-else condition to choose shapes
   if( q == 1 ){
        square s;      //creating object
        s.area();         //calling pure virtual function
        }
   else if( q == 2 ){
        circle c;       //creating object
        c.area();     //calling pure virtual function
        }
        else if( q == 3 ){
                rectangle r;     //creating object
                r.area();             //calling pure virtual function
```

```
        }
        else if( q == 4 ){
                triangle t;     //creating object
                t.area();       //calling pure virtual function
        }
        else if( q == 5 ){
                trapezium tt;    //creating object
                tt.area();     //calling pure virtual function
        }
        else{
                cout<<"\n\n\n\nPlease enter correct value from list\n\n\n\n"<<endl;
        }
        return 0;
}
```

OUTPUT:-