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Roll Number: SYCOC303   Division: C

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Problem Statement:

⇨ Create a base class called 'SHAPE' having-two data members of type double -member function get-data( )to initialize base class data members - pure virtual member function display-area( )to compute and display the area of the geometrical object.

Derive two specific classes 'TRIANGLE' and 'RECTANGLE' from the base class Using these three classes, design a program that will accept the dimension of a triangle / rectangle interactively and display the area. Implement using C++.

==

INPUT:

```
/*
 *     ===================================
 *          Program Name: ShapeInheritance.cpp
 *    Created on: November 30, 2022
 *     Author: Vinayak Shete
 *   ===================================
 */
/*
    How the inheritance in program will work??
    ==>>
    ==========================================================================
                                      Class Shape
                                          ||
                                          ||
                         =================================
                              ||
        ||
```

```
                                                    ||
            ||

                                class Triangle                                  class
    Rectangle


        =============================================================================
    */
    #include<iostream>
    #include<stdlib.h>
    using namespace std;


    class Shape
    {
            protected:
                    //data members for class Shape
                    double height,base;


            public:
                    //function for accepting the values from the user
                    void get_data()
                    {
                            cout<<"\n=============================";
                            cout<<"\nEnter the value of height for the selected geometrical
    object:";
                            cin>>height;
                            cout<<"\nEnter the value of base for the selected geometrical
    object:";
                            cin>>base;
                            cout<<"\n=============================";
                            cout<<"\nValues are entered successfully!!";
                            cout<<"\n=============================";
                    }


                    //pure virtual function for computing and displaying the results
                    virtual void display_area()=0;
    };


    class Triangle:public Shape
```

```cpp
{
      public:
              void display_area()
              {
                      cout<<"\n\n=================SELECTED OBJECT IS
TRIANGLE=================";
                      cout<<"\nThe height of the triangle is: "<<height<<" units.";
                      cout<<"\nThe base of the triangle is: "<<base<<" units.";
                      double area=(0.5*height*base);
                      cout<<"\nThe area of Triangle with height "<<height<<" and base
"<<base<<" is: "<<area<<" units sq.";\

      cout<<"\n=============================================================\n\n";
              }
};


class Rectangle:public Shape
{
              public:
              void display_area()
              {
                      cout<<"\n=================SELECTED OBJECT IS
RECTANGLE=================";
                      cout<<"\nThe breadth of the rectangle is: "<<height<<" units.";
                      cout<<"\nThe length of the rectangle is: "<<base<<" units.";
                      double area=(height*base);
                      cout<<"\nThe area of Rectangle with breadth "<<height<<" and
height "<<base<<" is: "<<area<<" units sq.";\

      cout<<"\n=============================================================\n\n";
              }
};


int main()
{
      int ch,ch1;
      Triangle t;
      Rectangle r;
      do
```

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```
        {
                cout<<"\n====================WELCOME====================";
                cout<<"\nGeometrical objects available
are:\n1.TRIANGLE\n2.RECTANGLE\n3.EXIT";
                cout<<"\nSelect the appropriate option you want:";
                cin>>ch;
                switch(ch)
                {
                        case 1:
                                t.get_data();
                                t.display_area();
                                break;

                        case 2:
                                r.get_data();
                                r.display_area();
                                break;

                        case 3:
                                goto exit1;
                                break;
                }
                cout<<"\nDo you want to continue with geometrical objects? [1-YES||0-NO]-
->";
                cin>>ch1;
        }while(ch1==1);
        exit1:
                cout<<"\n==============THANK YOU!===============";
        return 0;
}



==============================================================
```

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OUTPUT:

```
====================WELCOME====================
Geometrical objects available are:
1.TRIANGLE
2.RECTANGLE
3.EXIT
Select the appropriate option you want:1

==============================
Enter the value of height for the selected geometrical object:15

Enter the value of base for the selected geometrical object:25

==============================
Values are entered successfully!!
==============================

==================SELECTED OBJECT IS TRIANGLE==================
The height of the triangle is: 15 units.
The base of the triangle is: 25 units.
The area of Triangle with height 15 and base 25 is: 187.5 units sq.
==============================================================

Do you want to continue with geometrical objects? [1-YES||0-NO]-->
```

```
Do you want to continue with geometrical objects? [1-YES||0-NO]-->1

====================WELCOME====================
Geometrical objects available are:
1.TRIANGLE
2.RECTANGLE
3.EXIT
Select the appropriate option you want:2

==============================
Enter the value of height for the selected geometrical object:10

Enter the value of base for the selected geometrical object:25

==============================
Values are entered successfully!!
==============================
==================SELECTED OBJECT IS RECTANGLE==================
The breadth of the rectangle is: 10 units.
The length of the rectangle is: 25 units.
The area of Rectangle with breadth 10 and height 25 is: 250 units sq.
==============================================================

Do you want to continue with geometrical objects? [1-YES||0-NO]-->
```