Practical-10

Q. Program to create a triangle class and overloading area function and assignment and equality operators .

Code:-

```cpp
//Harsh Bamotra AC-1216
//Program to create a triangle class

#include <iostream>
#include <cmath>
using namespace std;

//defining class triangle
class triangle
    {
        private:                        //defining private members
        double base , height , side;

        public:
        void setData(double x , double y , double z)      //function to initialize the private members
            {
                    base=x;
                    height=y;
                    side=z;
            }

        void setData(double x , double y)        //overloading setData
            {
                    base=x;
                    height=y;
                    side=0;
            }

        double area(double base , double height)     //function to calculate the area
            {
                    double area;
                    area=0.5*base*height;
                    return area;
            }

        double area(double base , double height , double side)   //overloading area
            {
                    double area , sp;
                    sp=(base+height+side)/2;
                    area=sqrt(sp*(sp-base)*(sp-height)*(sp-side));
                    return area;
            }
```

```cpp
        void operator =(triangle &m)            //overloading assignment operator
                {
                        m.base=base;
                        m.height=height;
                        m.side=side;
                }



        bool operator ==(triangle &m)        //overloading equality operator
                {
                        if(m.base==base && m.height==height && m.side==side)
                                {
                                        return true;
                                }
                        else
                                {
                                        return false;
                                }
                }
    };




int main()
    {
        double s1 , s2 , s3;            //defining variables
        int ch;
        triangle t1 , t2;            //defining objects

        cout << endl << "**************** MENU **********************" << endl;
        cout << "1. Find area using three sides." << endl;
        cout << "2. Find area using two sides." << endl;
        cout << "Enter your choice ::";
        cin >> ch;

        switch (ch)
                {
                        case 1:
                                cout << endl << "***** Enter the sides of the triangle *****" << endl;
                                cout << "Enter the first side of the triangle::";
                                cin >> s1;
                                cout << "Enter the second side of the triangle::";        //taking the length of sides
                                cin >> s2;
                                cout << "Enter the third side of the triangle::";
                                cin >> s3;
                                t1.setData(s1 , s2 , s3);            //initializing data members
                                cout << "The area of the triangle::" << t1.area(s1 , s2 , s3) << endl;
                                break;                                            //printing the result
```

```cpp
                case 2:
                        cout << endl << "***** Enter the sides of the triangle *****" << endl;
                        cout << "Enter the first side of the triangle::";
                        cin >> s1;
                        cout << "Enter the second side of the triangle::";        //taking the length of sides
                        cin >> s2;
                        t1.setData(s1 , s2);                    //initializing data members
                        cout << "The area of the triangle::" << t1.area(s1 , s2) << endl;
                        break;                                          //printing the result

                default:
                        cout << "Wrong Input !! Exiting !!";
                        break;
        }

    if(ch==1 || ch==2)
            {
                    t1=t2;                                                  //demonstrating assignment
                    cout << endl << "********** Checking assignment **********" << endl;
                    if(t1==t2)                                          //demonstrating equality operator
                        {
                                cout << "Assignment successfull !!";
                        }
                    else                                                //printing if the assignment is successfull
                        {
                                cout << "Not successfull !!";
                        }
            }
    return 0;
}
```

Output:-

```
Command Prompt

C:\Users\harsh\Desktop\AC-1216\Practicales>g++ Practical-10.cpp -o Practical-10.exe

C:\Users\harsh\Desktop\AC-1216\Practicales>Practical-10.exe

****************** MENU **************************
1. Find area using three sides.
2. Find area using two sides.
Enter your choice ::1

***** Enter the sides of the triangle *****
Enter the first side of the triangle::12
Enter the second side of the triangle::12
Enter the third side of the triangle::8
The area of the triangle::45.2548

********** Checking assignment ************
Assignment successfull !!
C:\Users\harsh\Desktop\AC-1216\Practicales>Practical-10.exe

****************** MENU **************************
1. Find area using three sides.
2. Find area using two sides.
Enter your choice ::2

***** Enter the sides of the triangle *****
Enter the first side of the triangle::12
Enter the second side of the triangle::12
The area of the triangle::72

********** Checking assignment ************
Assignment successfull !!
C:\Users\harsh\Desktop\AC-1216\Practicales>Practical-10.exe

****************** MENU **************************
1. Find area using three sides.
2. Find area using two sides.
Enter your choice ::6
Wrong Input !! Exiting !!
C:\Users\harsh\Desktop\AC-1216\Practicales>
```

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