## Cpp Practicals\Q10\Q10.cpp

```cpp

/*
10. Create a Triangle class.  Add exception handling
statements to ensure the following conditions: all
sides are greater than 0 and sum of any two sides is greater than the
third side.   The class should also have overloaded functions for calculating
the area of a right angled triangle as well as using Heron's formula to calculate
the area of any type of triangle.
*/
#include <iostream>
#include <cmath>
#include <cstring>
using namespace std;
class Error {
    int err_code;
    string err_desc;

public:
    Error(int c, string errMsg)
    {
        err_code = c;
        err_desc = errMsg;
    }

    void err_display(void)
    {
        cout << "Error Code: " << err_code << endl << "Error Description: " << err_desc << endl;
    }
};

class Triangle
{
    float side1, side2, side3;
    public :
    Triangle(){}
    Triangle(float a, float b, float c)
    {
        try
        {
            if(a<= 0 || b <=0 || c <= 0)
            {
                throw Error(001,"Sides cannot be negative or 0!");
            }
            if(a >= b + c || b >= a + c || c >= a + b)
            {
                throw Error(002,"Either of side exceeds the sum of other two sides!");
            }
            side1 = a;
            side2 = b;
            side3 = c;

        }
        catch (Error e)
        {
            e.err_display();
```

```
        }


    }
    float area()
    {
        float s = (side1 + side2 + side3)/2;
        float area = sqrt(s*(s-side1)*(s-side2)*(s-side3));
        return area;
    }
    float area(float base, float height)
    {
        try
        {
             float area = (base * height)/2;
             if( area == 0)
             {
                throw Error(003, "Invalid Base or Height of Right triangle");
             }
             return area;

        }
        catch( Error e)
        {
            e.err_display();
        }
    }
};



int main()
{
    Triangle DEF(0,3,4);
    Triangle ABC(3, 4, 5);
    float area = ABC.area();
    cout<<"Area of general Trianle ABC is "<< area<<endl;
    Triangle PQR;
    float rArea = PQR.area(4,6);
    cout<<"Area of Right angled Trianle ABC is "<< rArea<<endl;


}

/*
Error Code: 1
Error Description: Sides cannot be negative or 0!
Area of general Trianle ABC is 6
Area of Right angled Trianle ABC is 12
PS C:\Users\hp\Desktop\Cpp\Cpp Practicals\Q10>
*/
```