```cpp
//CHAPTER 4 PROGRAMMING EXERCISE 4
//In this program, we are writing a code to calculate
the area and perimeter of a rectangle with a given
length
//and width; calculate the area of a traingle;
calculate the area and circumference of a circle
//with a specified raidus; and calculate the volume and
surface area of a cylinder.

#include <iostream>
#include <string>
#include <cmath>

using namespace std;
a
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int main()
{

//variable names needed to make this program work are
declared here

    string shape;
    double height;
    double length;
    double base;
    double width;
    double radius;
    double PI;

//the value of PI which is 3.14159265358979323, is
assigned below

    PI = 3.14159265358979323;
```

```
//here you input the type of shape out the the three - rectangle, triangle, circle, cylinder - you wish to work with

    cout << "Enter the shape type: rectangle, triangle, circle, cylinder" << endl;
    cin >> shape;
    cout << endl;

//we make use of the if and else if stamements in respect to selected shape you wish to work with.

    if (shape == "rectangle")
    {
        cout << "Enter the width of the rectangle ";
        cin >> width;
        cout << "Enter the length of the rectangle ";
        cin >> length;
        cout << endl;

        cout << "Perimeter of the rectangle = " << 2 * (length + width) << endl;

        cout << "Area of the rectangle = " << (length * width) << endl;
     }

     else if (shape == "triangle")
    {
        cout << "Enter the base of the triangle: ";
        cin >> base;
        cout << endl;

        cout << "Enter the height of the triangle: ";
        cin >> height;
        cout << endl;

        cout << "Area of the triangle = " << 0.5 * base * height << endl;
```

```
    }

    else if (shape == "circle")
    {
        cout << "Enter the radius of the circle: ";
        cin >> radius;
        cout << endl;

        cout << "Area of the circle = " << PI *
pow(radius, 2.0) << endl;


        cout << "circumference of the circle: " << 2 *
PI * radius << endl;
    }

    else if (shape == "circle")
    {
        cout << "Enter the height of the cylinder ";
        cin >> height;
        cout << endl;

        cout << "Volume of the cylinder = " << PI *
pow(radius, 2.0) * height << endl;

        cout << "Surface area of the cylinder: " << 2 *
PI * radius * height + 2 * PI * pow(radius, 2.0)
             << endl;
     }

//here I have written a program to let you know if you
have misspelled a shape, or put in a shape that is not
in
//the program

     else if (shape != "rectangle, triangle, circle,
cylinder")
     {
```

```
          cout << "The shape does not exist in the
program (also make sure your spelling is right)" <<
endl;
     }

return 0;

}
```