**LAB SESSION 12**

**1. Write a class Circle with a private member radius. Write a friend function to calculate the area of the circle.**

**Code:**

#include <iostream>

using namespace std;

int startlab12()

{

    cout << "Name: Saad Ali Khan(SE-23083)" << endl;

    cout << "Start of Lab 12" << endl;

    return 0;

}

class Circle

{

private:

    double radius;

public:

    Circle(double r) : radius(r) {}

    friend double calculateArea(const Circle &c);

};

double calculateArea(const Circle &c)

{

    return 3.14 \* c.radius \* c.radius;

}

int l12q1()

{

    Circle circle(5.0);

    cout << "Area of the circle: " << calculateArea(circle) << endl;

    return 0;

}

int main()

{

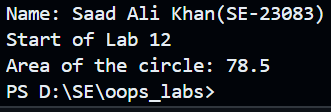
    startlab12();

    l12q1();

    return 0;

}

**Output:**

****

**2. Implement a class Rectangle with private members length and width. Write a friend function to calculate the perimeter of the rectangle.**

**Code:**

#include <iostream>

using namespace std;

int startlab12()

{

    cout << "Name: Saad Ali Khan(SE-23083)" << endl;

    cout << "Lab 12" << endl;

    return 0;

}

class Rectangle

{

private:

    double length;

    double width;

public:

    Rectangle(double l, double w) : length(l), width(w) {}

    friend double calculatePerimeter(const Rectangle &r);

};

double calculatePerimeter(const Rectangle &r)

{

    return 2 \* (r.length + r.width);

}

int l12q2()

{

    Rectangle rectangle(10.0, 5.0);

    cout << "Perimeter of the rectangle: " << calculatePerimeter(rectangle) << endl;

    return 0;

}

int main()

{

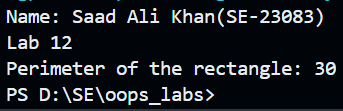
    startlab12();

    l12q2();

    return 0;

}

**Output:**

****