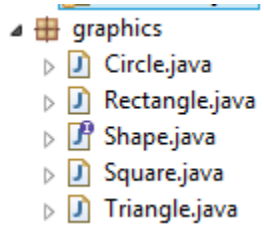
1. Create a Graphics package that has classes and interfaces for figures Rectangle, Triangle, Square and Circle. Test the package by finding the area of these figures.

```
//Mainclass.java
import graphics.*;
import java.util.Scanner;

public class Mainclass {

    public static void main(String[] args){
        Scanner scanner = new Scanner(System.in);
        int shape;

        System.out.println("Choose a Shape 1)Circle 2)Rectangle 3)Square 4)Triangle : ");
        shape = scanner.nextInt();

        if(shape==1){
            Circle circle = new Circle();
            circle.area();
        }
        else if(shape==2)
        {
            Rectangle rectangle = new Rectangle();
            rectangle.area();
        }
        else if(shape==3)
        {
            Square square = new Square();
            square.area();
        }
        else if(shape==4)
        {
            Triangle triangle = new Triangle();
            triangle.area();
        }
        else {
            System.out.println("Incorrect Shape code.");
        }
    }

}
```

Graphic package




```
//Cricle.java
package graphics;


import java.util.Scanner;

public class Circle implements Shape {

    int radius;
    Scanner scanner = new Scanner(System.in);

    public void area() {
        System.out.println("Input radius of circle : ");
        radius = scanner.nextInt();
        String area = Double.toString(Math.PI*radius*radius);
        System.out.println("Area of the circle is : "+area);
    }

}

//Rectangle.java

package graphics;

import java.util.Scanner;

public class Rectangle implements Shape {

    int length;
    int breadth;

    Scanner scanner = new Scanner(System.in);

    public void area() {
        System.out.println("Input length of rectangle : ");
        length = scanner.nextInt();
```

```
        System.out.println("Input breadth of rectangle : ");
        length = scanner.nextInt();
        String area = Double.toString(length*breadth);
        System.out.println("Area of the rectangle is : "+area);
    }

}

//Shape .java
package graphics;

public interface Shape {
    public void area();
}

package graphics;

import java.util.Scanner;

public class Square {

    int side;
    Scanner scanner = new Scanner(System.in);

    public void area() {
        System.out.println("Input side length of square : ");
        side = scanner.nextInt();
        String area = Double.toString(side*side);
        System.out.println("Area of the square : "+area);
    }

}

//Triangle.java
package graphics;

import java.util.Scanner;

public class Triangle {

    int height;
    int breadth;

    Scanner scanner = new Scanner(System.in);
```

```
    public void area() {

        System.out.println("Input height of the triangle : ");
        height = scanner.nextInt();
        System.out.println("Input breadth of triangle : ");
        breadth = scanner.nextInt();
        String area = Double.toString((height*breadth)/2f);
        System.out.println("Area of the triangle is : "+area);

    }

}
```

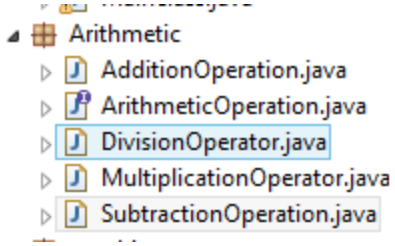
Output

```
Choose a Shape 1)Circle 2)Rectangle 3)Square 4)Triangle :
1
Input radius of circle :
4
Area of the circle is : 50.26548245743669
```

2. Create an Arithmetic package that has classes and interfaces for the 4 basic arithmetic operations. Test the package by implementing all operations on two given numbers

```
//Main.java
import Arithmetic.*;
import java.util.Scanner;

public class Main {

    public static void main(String[] args)
    {

        Scanner scanner = new Scanner(System.in);

        System.out.println("Choose an operation : 1.Add, 2.Subtract, 3.Multiply, 4.Divide");
        int choice = scanner.nextInt();

        System.out.println("Enter the numbers : ");
        int number1 = scanner.nextInt();
```

```
        int number2= scanner.nextInt();

        System.out.println("The Result is : ");

        switch (choice){
            case 1:
                AdditionOperation additionOperation = new AdditionOperation();
                System.out.println(additionOperation.operateNumbers(number1,number2));
                break;
            case 2:
                SubtractionOperation subtractionOperation = new SubtractionOperation();
                System.out.println(subtractionOperation.operateNumbers(number1,number2));
                break;
            case 3:
                MultiplicationOperator multiplicationOperator = new MultiplicationOperator();
                System.out.println(multiplicationOperator.operateNumbers(number1,number2));
                break;
            case 4:
                DivisionOperator divisionOperator = new DivisionOperator();
                System.out.println(divisionOperator.operateNumbers(number1,number2));
                break;
            default:
                System.out.println("Invalid Code");
        }

    }

}


//AdditionOperation.java
package Arithmetic;

public class AdditionOperation implements ArithmeticOperation {

    public int operateNumbers(int number1,int number2)
    {
        return number1+number2;
    }

}
```




```
//ArithmeticOperation.java
package Arithmetic;

public interface ArithmeticOperation {

    public int operateNumbers(int number1,int number2);

}

//DivisionOperator
package Arithmetic;

public class DivisionOperator implements ArithmeticOperation{

    public int operateNumbers(int number1,int number2)
    {
        return number1*number2;
    }

}

//MultiplicationOperator.java
package Arithmetic;

public class MultiplicationOperator implements ArithmeticOperation{

    public int operateNumbers(int number1,int number2)
    {
        return number1*number2;
    }

}

//SubtractionOperation.java
package Arithmetic;

public class SubtractionOperation implements ArithmeticOperation{
```

```
    public int operateNumbers(int number1,int number2)
    {
        return number1-number2;
    }

}
```

Output

```
Choose an operation : 1.Add, 2.Subtract, 3.Multiply, 4.Divide
1
Enter the numbers :
5
5
The Result is :
10
```