一、 实验名称

Methods

二、 实验目的

- Be able to write methods
- Be able to call methods
- Be able to write javadoc comments
- Be able to create HTML documentation for our Java class using javadoc

三、 实验内容

Task #1 void Methods
Task #2 Value-Returning Methods
Task #3 Calling Methods
Task #4 Java Documentation

四、 实验方法(原理、流程图)

1. Written by Intellij IDEA Community edition 2020.3

2.

Task 1:

（1）Copy the file Geometry.java (code listing 5.1).
（2）Create a static method called printMenu which print out instructions for the user with a menu of options for the user to choose from.
（3）Add a line in the main method that calls the printMenu method as indicated by the comments.

Task 2:

(1) Write a static method called circleArea that takes in the radius of the circle and returns the area using the formula $A = \pi r 2$.
(2) Write a static method called rectangleArea that takes in the length and width of the rectangle and returns the area using the formula A = lw.
(3) Write a static method called triangleArea that takes in the base and height of the triangle and returns the area using the formula A = ½bh.
(4) Write a static method called circleCircumference that takes in the radius of the circle and returns the circumference using the formula $C = 2\pi r$.
(5) Write a static method called rectanglePerimeter that takes in the length and the width of the rectangle and returns the perimeter of the rectangle using the formula P = 2l +2w.
(6) Write a static method called trianglePerimeter that takes in the lengths of the three sides of the triangle and returns the perimeter of the triangle which is calculated by adding up the three sides.

Task 3:

(1) Add lines in the main method in the GeometryDemo class which will call these Methods.

(2) Write some sample data and hand calculated results for you to test all 6 menu items.

Task4:

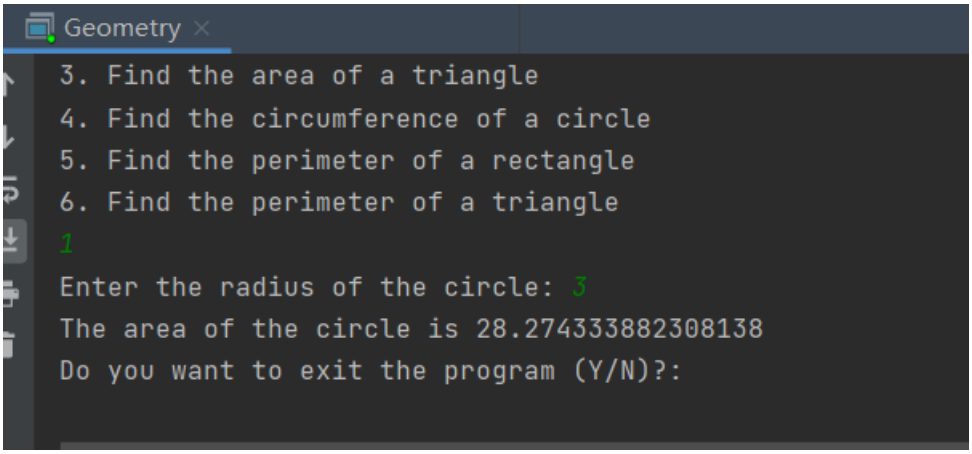
Write javadoc comments for each of the 7 static methods.

五、 实验结论

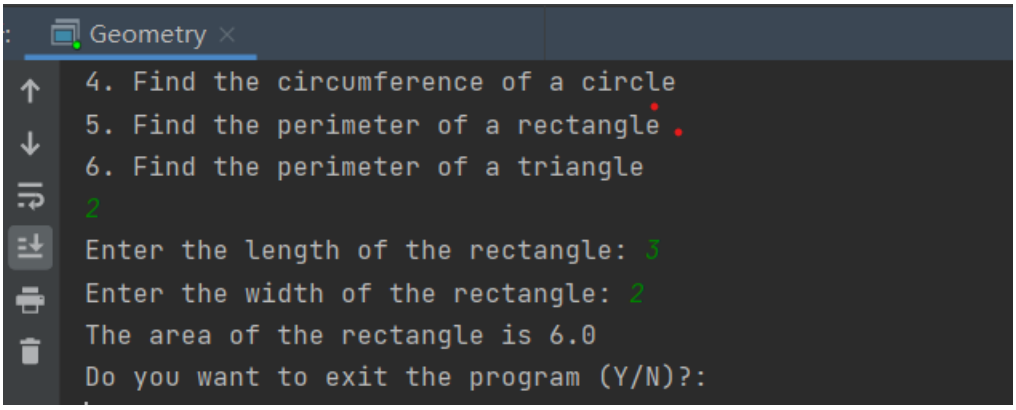
The experimental requirements have been successfully realized.

The results of manual calculation are the same as those calculated by six methods.

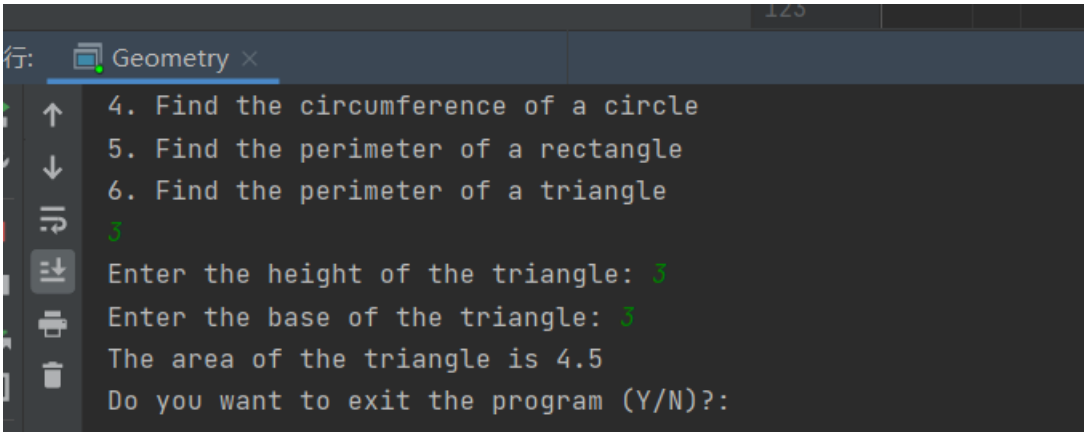
(1) circleArea



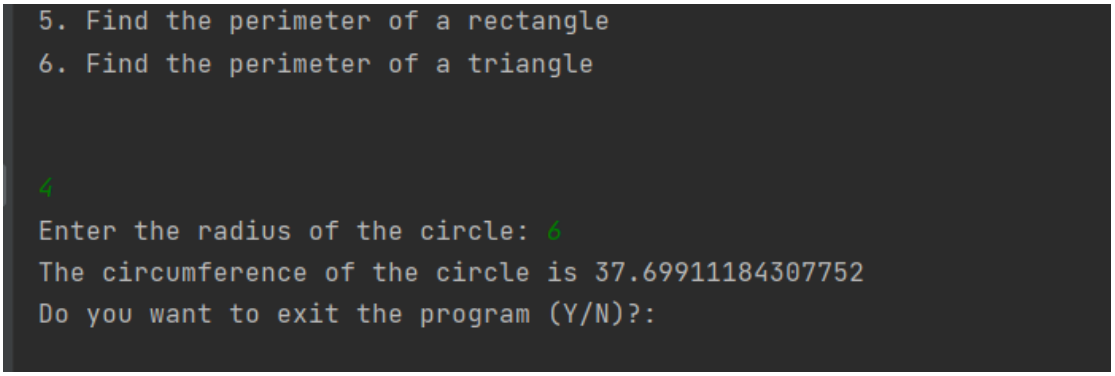
(2) rectangleArea



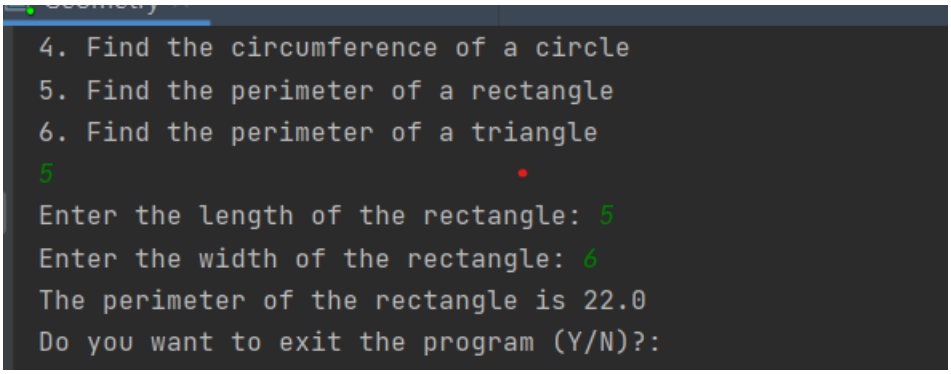
(3) triangleArea



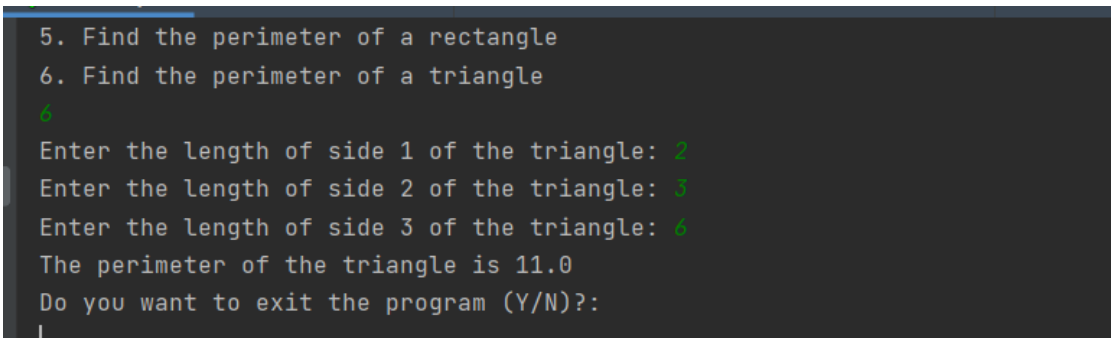
(4) circleCircumference



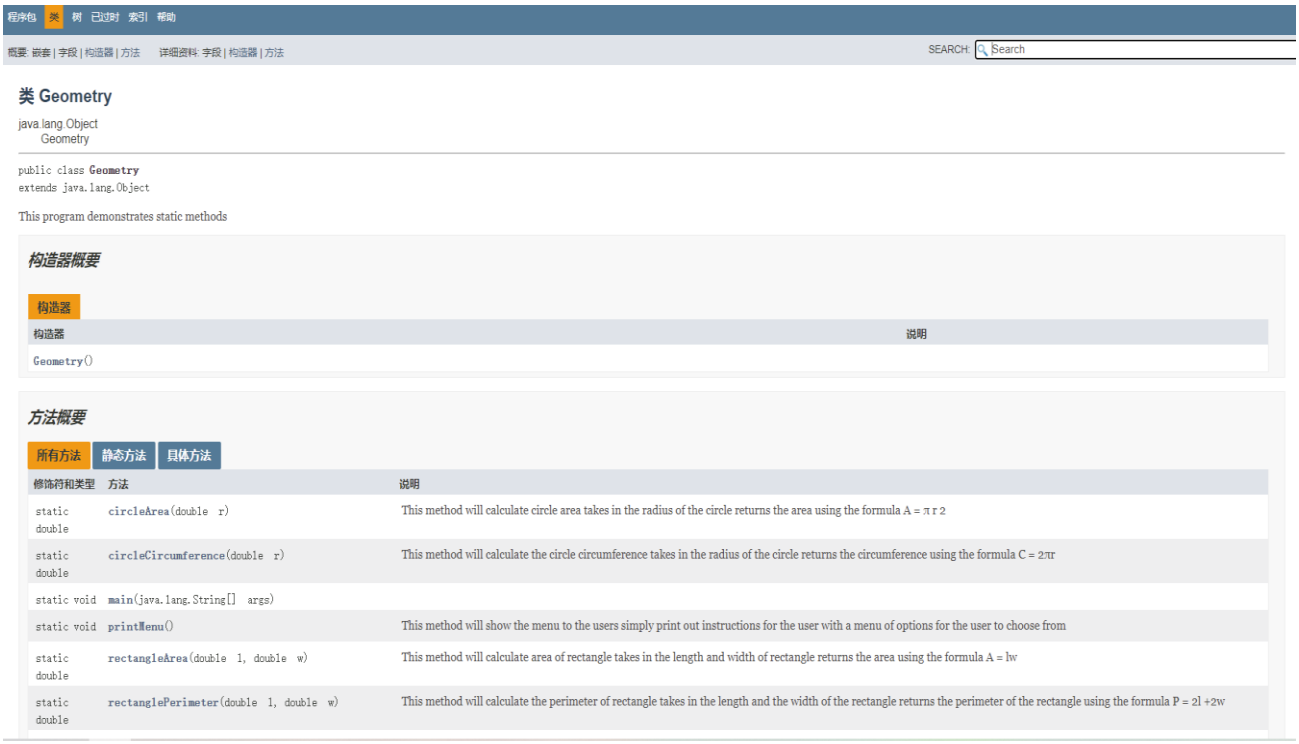
(5) rectanglePerimeter



(6) trianglePerimeter



(7) javadoc



程序包 类 树 已过时 索引 帮助

概要: 嵌套 | 字段 | 构造器 | 方法 详细资料: 字段 | 构造器 | 方法 SEARCH: Search

类 Geometry

java.lang.Object
Geometry

public class **Geometry**
extends java.lang.Object

This program demonstrates static methods

构造器概要

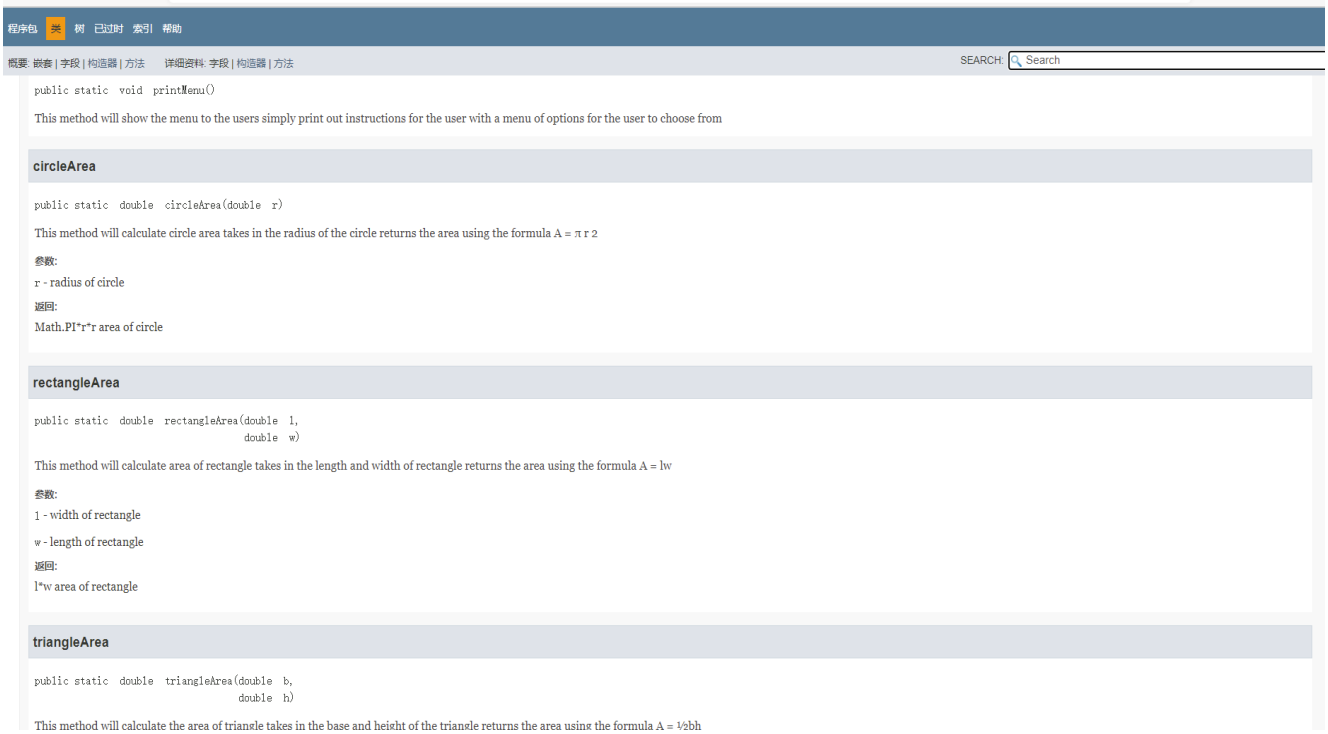
构造器

构造器	说明
Geometry()	

方法概要

所有方法 静态方法 具体方法

修饰符和类型	方法	说明
static double	circleArea(double r)	This method will calculate circle area takes in the radius of the circle returns the area using the formula A = π r 2
static double	circleCircumference(double r)	This method will calculate the circle circumference takes in the radius of the circle returns the circumference using the formula C = 2πr
static void	main(java.lang.String[] args)	
static void	printMenu()	This method will show the menu to the users simply print out instructions for the user with a menu of options for the user to choose from
static double	rectangleArea(double l, double w)	This method will calculate area of rectangle takes in the length and width of rectangle returns the area using the formula A = lw
static double	rectanglePerimeter(double l, double w)	This method will calculate the perimeter of rectangle takes in the length and the width of the rectangle returns the perimeter of the rectangle using the formula P = 2l +2w



程序包 类 树 已过时 索引 帮助

概要: 嵌套 | 字段 | 构造器 | 方法 详细资料: 字段 | 构造器 | 方法 SEARCH: Search

public static void printMenu()

This method will show the menu to the users simply print out instructions for the user with a menu of options for the user to choose from

circleArea

public static double circleArea(double r)

This method will calculate circle area takes in the radius of the circle returns the area using the formula A = π r 2

参数:
r - radius of circle

返回:
Math.PI*r*r area of circle

rectangleArea

public static double rectangleArea(double l,
double w)

This method will calculate area of rectangle takes in the length and width of rectangle returns the area using the formula A = lw

参数:
l - width of rectangle
w - length of rectangle

返回:
l*w area of rectangle

triangleArea

public static double triangleArea(double b,
double h)

This method will calculate the area of triangle takes in the base and height of the triangle returns the area using the formula A = ½bh

六、实验体会和收获

1. Through this task I successfully put methods into practice and write javadoc correctly.By writing these code,I have a deepy realize to methods.Mainly about how to write methods and use it in the main function.

2. When writing these codes,i meet some difficults.But I solve these problemss by search relevant information on the Internet and review PPT.

3. By writing this task I am more interested in Java.

七、程序代码

```
import java.util.Scanner;

/**

        This program demonstrates static methods

 */

//create Geometry to show menu

public class Geometry

{

    /**

        * This method will show the menu to the users

        * Simply print out instructions for the user with a menu of options for the user

to choose from

        */

            public static void printMenu()

            {

                    System.out.println("This is a geometry calculator");

                    System.out.println("Choose what you would like to calculate");

                    System.out.println("1. Find the area of a circle");

                    System.out.println("2. Find the area of a rectangle");

                    System.out.println("3. Find the area of a triangle");

                    System.out.println("4. Find the circumference of a circle");

                    System.out.println("5. Find the perimeter of a rectangle");
```

```
            System.out.println("6. Find the perimeter of a triangle");
        }
    /**
     * This method will calculate circle area
     * Take in the radius of the circle
     * Return the area using the formula A = π r 2
     * @param r radius of circle
     * @return Math.PI*r*r area of circle
     */
    public static double circleArea(double r)
        {
            return Math.PI*r*r;
        }
    /**
     * This method will calculate area of rectangle
     * Take in the length and width of rectangle
     * Return the area using the formula A = lw
     * @param l width of rectangle
     * @param w length of rectangle
     * @return l*w area of rectangle
     */
        public static double rectangleArea(double l,double w)
```

```
        {
            return l*w;
        }
    /**
     * This method will calculate the area of triangle
     * Take in the base and height of the triangle
     * Return the area using the formula A = ½bh
     * @param b base of triangle
     * @param h height of triangle
     * @return b*h/2 area of triangle
     */
        public static double triangleArea(double b, double h)
        {
            return b*h/2;
        }
    /**
     * This method will calculate the circle circumference
     * Take in the radius of the circle
     * Return the circumference using the formula C = 2πr
     * @param r the radius of the circle
     * @return Math.PI*r*2 circumference of the circle
     */
```

```
        public static double circleCircumference(double r)
        {
            return   Math.PI*r*2;
        }
    /**
     * This method will calculate the perimeter of rectangle
     * Take in the length and the width of the rectangle
     * Return the perimeter of the rectangle using the formula P = 2l +2w
     * @param l the length of rectangle
     * @param w the width of the rectangle
     * @return 2l+2w the perimeter of the rectangle
     */
        public static double rectanglePerimeter(double l,double w)
        {
            return 2*l+2*w;
        }
    /**
     * This method will calculate the perimeter of triangle
     * Take in the lengths of the three sides of the triangle
     * Return the perimeter of the triangle which is calculated by adding up the three
sides
     * @param l1 the first lengths of the three sides of the triangle
```

```
     * @param l2 the second lengths of the three sides of the triangle
     * @param l3 the third lengths of the three sides of the triangle
     * @return l1+l2+l3 the perimeter of the triangle
     */
        public static double trianglePerimeter(double l1,double l2,double l3)
        {
            return l1+l2+l3;
        }
        public static void main (String [] args)
        {
            int choice; //the user's choice
            double value; //the value returned from the method
            char letter; //the Y or N from the user's decision to exit
            double radius; //the radius of the circle
            double length; //the length of the rectangle
            double width; //the width of the rectangle
            double height; //the height of the triangle
            double base; //the base of the triangle
            double side1; //the first side of the triangle
            double side2; //the second side of the triangle
            double side3; //the third side of the triangle
```

```
        //create a scanner object to read from the keyboard
        Scanner keyboard = new Scanner (System.in);

        //do loop was chose to allow the menu to be displayed first
        do
        {
            //call the printMenu method
            printMenu();
            choice = keyboard.nextInt();
            switch (choice)
            {
                case 1:
                    System.out.print("Enter the radius of the circle: ");
                    radius = keyboard.nextDouble();
                    //call the circleArea method and store the result in the
value
                    value = circleArea(radius);
                    System.out.println("The area of the circle is " + value);
                    break;
                case 2:
                    System.out.print("Enter the length of the rectangle: ");
                    length = keyboard.nextDouble();
```

```
                    System.out.print("Enter the width of the rectangle: ");
                    width = keyboard.nextDouble();
                    value = rectangleArea(length,width);
                    //call the rectangleArea method and store the result in
the value
                    System.out.println("The area of the rectangle is " +
value);
                    break;
                case 3:
                    System.out.print("Enter the height of the triangle: ");
                    height = keyboard.nextDouble();
                    System.out.print("Enter the base of the triangle: ");
                    base = keyboard.nextDouble();
                    value = triangleArea(height,base);
                    //call the triangleArea method and store the result in
the value
                    System.out.println("The area of the triangle is " + value);
                    break;
                case 4:
                    System.out.print("Enter the radius of the circle: ");
                    radius = keyboard.nextDouble();
                    value = circleCircumference(radius);
```

```
                        //call the circumference method and store the result in
the value
                        System.out.println("The circumference of the circle is " +
value);
                        break;
                    case 5:
                        System.out.print("Enter the length of the rectangle: ");
                        length = keyboard.nextDouble();
                        System.out.print("Enter the width of the rectangle: ");
                        width = keyboard.nextDouble();
                        value=rectanglePerimeter(length,width);
                        //call the perimeter method and store the result in the
value
                        System.out.println("The perimeter of the rectangle is " +
value);
                        break;
                    case 6:
                        System.out.print("Enter the length of side 1 of the
triangle: ");
                        side1 = keyboard.nextDouble();
                        System.out.print("Enter the length of side 2 of the
triangle: ");
```

```
                                side2 = keyboard.nextDouble();
                                System.out.print("Enter the length of side 3 of the
triangle: ");
                                side3 = keyboard.nextDouble();
                                value=trianglePerimeter(side1,side2,side3);
                                //call the perimeter method and store the result in the
value
                                System.out.println("The perimeter of the triangle is " +
value);
                                break;
                            default:
                                System.out.println("You did not enter a valid choice.");
                        }

                        //consumes the new line character after the number
                        keyboard.nextLine();
                        System.out.println("Do you want to exit the program (Y/N)?: ");
                        String answer = keyboard.nextLine();
                        letter = answer.charAt(0);
                    }while (letter != 'Y' && letter != 'y');
                }
}
```