public class MethodExample001 {

    /**
     * MethodExample001
     * Simple example of the use of methods in Java.
     * Author: Don Spickler
     * Date: 3/7/2011
     */

    public static void PrintLine() {
        System.out.println("This is a line of text.");
    }

    public static void main(String[] args) {
        System.out.println("Start Here");
        PrintLine();
        System.out.println("Back to the Main");
        PrintLine();
        System.out.println("End Here");
    }
}

Run:
Start Here
This is a line of text.
Back to the Main
This is a line of text.
End Here

public class MethodExample002 {

    /**
     * MethodExample002
     * Simple example of the use of methods in Java.
     * Author: Don Spickler
     * Date: 3/7/2011
     */

    public static void PrintIntro() {
        System.out.println("This is the intro to the program.");
    }

    public static void PrintGoodbye() {
        System.out.println("Have a nice day :-)");
    }

    public static void main(String[] args) {
        PrintIntro();
        for (int i = 0; i < 5; i++)
            { System.out.print(i + " ");
        }
        System.out.println();
        PrintGoodbye();
    }
}

Run:
This is the intro to the program.
0 1 2 3 4
Have a nice day :-)
import java.util.Scanner;

public class MethodExample003 {

  /**
   * MethodExample003
   * Simple example of the use of methods in Java.
   * Author: Don Spickler
   * Date: 3/7/2011
   */
  public static void Welcome(String name) {
    System.out.println("Welcome to Java Methods " + name);
  }

  public static void main(String[] args) {
    Scanner keyboard = new Scanner(System.in);
    System.out.print("Input your name: ");
    String myName = keyboard.nextLine();
    Welcome(myName);
  }
}

Run:
Input your name: Don Spickler
Welcome to Java Methods Don Spickler

import java.util.Scanner;

public class MethodExample004 {

  /**
   * MethodExample004
   * Simple example of the use of methods in Java.
   * Author: Don Spickler
   * Date: 3/7/2011
   */
  public static void PrintFormalName(String firstName, String lastName) {
    System.out.println("Hello " + firstName + " " + lastName);
    System.out.println("Your formal name is " + lastName + ", " + firstName);
  }

  public static void main(String[] args) {
    Scanner keyboard = new Scanner(System.in);
    System.out.print("Input your name as, first last: ");
    String firstName = keyboard.next();
    String lastName = keyboard.next();
    PrintFormalName(firstName, lastName);
  }
}

Run:
Input your name as, first last: Don Spickler
Hello Don Spickler
Your formal name is Spickler, Don
import java.util.Scanner;

public class MethodExample005 {

    /**
     * MethodExample005
     * Simple example of the use of methods in Java.
     * Author:  Don Spickler
     * Date: 3/7/2011
     */

    public static void PrintCircleArea(double radius) {
        System.out.println("Circle Area = " + Math.PI*radius*radius);
    }

    public static void PrintRectangleArea(double length, double width) {
        System.out.println("Rectangle Area = " + length*width);
    }

    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        System.out.print("Input the radius of the circle: ");
        double rad = keyboard.nextDouble();
        System.out.print("Input the length of the rectangle: ");
        double len = keyboard.nextDouble();
        System.out.print("Input the width of the rectangle: ");
        double wid = keyboard.nextDouble();

        PrintCircleArea(rad);
        PrintRectangleArea(len, wid);
    }
}

Run:
Input the radius of the circle: 5
Input the length of the rectangle: 10
Input the width of the rectangle: 15
Circle Area = 78.53981633974483
Rectangle Area = 150.0
```java
import java.util.Scanner;

public class MethodExample006 {

    /**
     * MethodExample006
     * Simple example of the use of methods in Java.
     * Author: Don Spickler
     * Date: 3/7/2011
     */

    public static double CircleArea(double radius) {
        return Math.PI*radius*radius;
    }

    public static double RectangleArea(double length, double width) {
        return length*width;
    }

    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        System.out.println("Input the radius of the circle: ");
        double rad = keyboard.nextDouble();
        System.out.println("Input the length of the rectangle: ");
        double len = keyboard.nextDouble();
        System.out.println("Input the width of the rectangle: ");
        double wid = keyboard.nextDouble();

        System.out.println("Circle Area = " + CircleArea(rad));
        System.out.println("Rectangle Area = " + RectangleArea(len, wid));
    }
}
```

**Run:**
Input the radius of the circle: 5
Input the length of the rectangle: 10
Input the width of the rectangle: 15
Circle Area = 78.53981633974483
Rectangle Area = 150.0
import java.util.Scanner;

public class MethodExample007 {

    /**
     * MethodExample007
     * Simple example of the use of methods in Java.
     * Author: Don Spickler
     * Date: 3/7/2011
     */

    public static double CircleArea(double radius) {
        return Math.PI*radius*radius;
    }

    public static double RectangleArea(double length, double width) {
        return length*width;
    }

    public static int menu() {
        Scanner keyboard = new Scanner(System.in);
        int menuOption = 0;
        while (menuOption < 1 || menuOption > 3){
            System.out.println("Please select from the following menu:");
            System.out.println("1. Rectangle Properties");
            System.out.println("2. Circle Properties");
            System.out.println("3. Exit");
            System.out.println();
            System.out.print("Selection: ");
            menuOption = keyboard.nextInt();
            System.out.println();
            if (menuOption < 1 || menuOption > 3){
                System.out.println("Invalid Menu Selection!");
                System.out.println("Please make another selection.");
                System.out.println();
            }
        }
        return menuOption;
    }

    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        int menuOption = 0;
        while (menuOption != 3)
        {
            menuOption = menu();
            if (menuOption == 1){
                System.out.print("Input the width of the rectangle: ");
                double width = keyboard.nextDouble();
                System.out.print("Input the height of the rectangle: ");
                double height = keyboard.nextDouble();
                System.out.println("The area of the rectangle is " + RectangleArea(width, height));
            } else if (menuOption == 2){
                System.out.print("Input the radius of the circle: ");
                double rad = keyboard.nextDouble();
                System.out.println("The area of the circle is " + CircleArea(rad));
            }
            System.out.println();
        }
    }
}
Run:

Please select from the following menu:
1. Rectangle Properties
2. Circle Properties
3. Exit

Selection: 6

Invalid Menu Selection!
Please make another selection.

Please select from the following menu:
1. Rectangle Properties
2. Circle Properties
3. Exit

Selection: 1

Input the width of the rectangle: 2
Input the height of the rectangle: 3
The area of the rectangle is 6.0

Please select from the following menu:
1. Rectangle Properties
2. Circle Properties
3. Exit

Selection: 2

Input the radius of the circle: 5
The area of the circle is 78.53981633974483

Please select from the following menu:
1. Rectangle Properties
2. Circle Properties
3. Exit

Selection: 3
public class MethodExample008 {

    /* MethodExample008
    * Nifty Sequence Example
    * Author: Don Spickler
    * Date: 3/7/2011
    */

    public static int NiftySequence(int n) {
        if (n % 2 == 0) {
            n = n / 2;
        } else {
            n = 3 * n + 1;
        }
        return n;
    }

    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        System.out.print("Input a number: ");
        int n = keyboard.nextInt();
        System.out.print("Sequence: "+n+");
        int count = 1;
        while (n != 1) {
            n = NiftySequence(n);
            System.out.print(n + " ");
            count++;
        }
        System.out.println();
        System.out.println("The number of numbers in the sequence is " + count);
    }
}

Run:
Input a number: 104
Sequence: 104 52 26 13 40 20 10 5 16 8 4 2 1
The number of numbers in the sequence is 13
```java
import java.util.Scanner;

public class MethodExample009 {
    /**
     * MethodExample009
     * Heron's Formula for the Area of a Triangle
     * Author: Don Spickler
     * Date: 3/7/2011
     */

    public static double distance(double x1, double y1, double x2, double y2) {
        return Math.sqrt((x2-x1)*(x2-x1)+(y2-y1)*(y2-y1));
    }

    public static double heron(double a, double b, double c) {
        double p = (a+b+c)/2;
        return Math.sqrt(p*(p-a)*(p-b)*(p-c));
    }

    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        System.out.print("Input point 1 as x y: ");
        double x1 = keyboard.nextDouble();
        double y1 = keyboard.nextDouble();
        System.out.print("Input point 2 as x y: ");
        double x2 = keyboard.nextDouble();
        double y2 = keyboard.nextDouble();
        System.out.print("Input point 3 as x y: ");
        double x3 = keyboard.nextDouble();
        double y3 = keyboard.nextDouble();

        double a = distance(x1, y1, x2, y2);
        double b = distance(x1, y1, x3, y3);
        double c = distance(x3, y3, x2, y2);

        System.out.println("The area of the triangle is "+ heron(a, b, c));
    }
}
```

Run:
Input point 1 as x y: 2 1
Input point 2 as x y: 3 7
Input point 3 as x y: 0 4
The area of the triangle is 7.5
import java.util.Random;
import java.util.Scanner;

public class MethodExample010 {

    /**
     * MethodExample010
     * Guessing Game Example 1
     * Author: Don Spickler
     * Date: 3/7/2011
     */

    // returns true if the user wins.
    public static boolean GuessingGame() {
        Random generator = new Random();
        Scanner keyboard = new Scanner(System.in);
        int answer = generator.nextInt(100)+1;
        int numGuesses = 1;
        int guess = 0;

        while ((numGuesses <= 7) && (guess != answer)) {
            System.out.print("Guess a number: ");
            guess = keyboard.nextInt();

            if (numGuesses < 7) {
                if (guess < answer) {
                    System.out.println("Higher...");
                } else if (guess > answer) {
                    System.out.println("Lower...");
                } else {
                    System.out.println("You Win");
                    return true;
                }
            } else {
                if (guess == answer) {
                    System.out.println("You Win");
                    return true;
                } else {
                    System.out.println("I Win, the number was " + answer);
                    return false;
                }
            }
            numGuesses++;
        }
        return false; // Never happens but the compiler needs it.
    }

    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        String playAgain = "Y";
        int userWins = 0;
        int computerWins = 0;

        while (playAgain.compareToIgnoreCase("Y") == 0) {
            boolean youWin = GuessingGame();
            
            if (youWin) {
                userWins++;
            } else {
                computerWins++;
            }
            System.out.println("User wins: ");
        }
if (youWin) {
    userWins++;
} else {
    computerWins++;
}

System.out.print("Would you like to play another game? (Y/N): ");
playAgain = keyboard.next();

System.out.println("Final Score: You " + userWins + " Computer " + computerWins);
}

Run:

Guess a number: 50
Higher...
Guess a number: 75
Lower...
Guess a number: 62
Lower...
Guess a number: 56
Higher...
Guess a number: 59
Higher...
Guess a number: 60
You Win
Would you like to play another game? (Y/N): y
Guess a number: 25
Higher...
Guess a number: 26
Higher...
Guess a number: 27
Higher...
Guess a number: 28
Higher...
Guess a number: 29
Higher...
Guess a number: 30
Higher...
Guess a number: 31
I Win, the number was 85
Would you like to play another game? (Y/N): n
Final Score: You 1 Computer 1
import java.util.Random;
import java.util.Scanner;

public class MethodExample011 {

    public static boolean GuessingGame() {
        Random generator = new Random();
        Scanner keyboard = new Scanner(System.in);

        int answer = generator.nextInt(100) + 1;
        int numGuesses = 1;
        int guess = 0;

        while ((numGuesses <= 7) && (guess != answer)) {
            System.out.print("Guess a number: ");
            guess = keyboard.nextInt();

            if (numGuesses < 7) {
                if (guess < answer)
                    System.out.println("Higher...");
                else if (guess > answer)
                    System.out.println("Lower...");
                else {
                    System.out.println("You Win");
                    return true;
                }
            } else {
                if (guess == answer)
                    System.out.println("You Win");
                return true;
            }
            numGuesses++;
        }
        return false; // Never happens but the compiler needs it.
    }

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

        String playAgain = "Y";
        int userWins = 0;
        int computerWins = 0;

        while (playAgain.compareToIgnoreCase("Y") == 0) {
            if (GuessingGame())
                userWins++;
            else
                computerWins++;

            System.out.print("Would you like to play another game? (Y/N): ");
            playAgain = keyboard.next();
        }
        System.out.println("Final Score: You " + userWins + " Computer " + computerWins);
    }
}
Rectangle.java

```java
public class Rectangle {
    public static double Area(double length, double width) {
        return length*width;
    }

    public static double Perimeter(double length, double width) {
        return 2*length + 2*width;
    }
}
```

Circle.java

```java
public class Circle {
    public static double Area(double radius) {
        return Math.PI*radius*radius;
    }

    public static double Circumference(double radius) {
        return 2*Math.PI*radius;
    }

    public static double Perimeter(double radius) {
        return Circumference(radius);
    }
}
```

MethodExample012.java

```java
import java.util.Scanner;

public class MethodExample012 {

    /**
     * MethodExample012
     * External Class Methods Example
     * Author: Don Spickler
     * Date: 3/7/2011
     */

    public static int menu() {
        Scanner keyboard = new Scanner(System.in);
        int menuOption = 0;
        while (menuOption < 1 || menuOption > 3){
            System.out.println("Please select from the following menu:");
            System.out.println("1. Rectangle Properties");
            System.out.println("2. Circle Properties");
            System.out.println("3. Exit");
            System.out.println();
            System.out.print("Selection: ");
            menuOption = keyboard.nextInt();
            System.out.println();
            if (menuOption < 1 || menuOption > 3){
                System.out.println("Invalid Menu Selection!");
                System.out.println("Please make another selection.");
                System.out.println();
            }
        }
        return menuOption;
    }
}
```
```java
public static void main(String[] args) {
    Scanner keyboard = new Scanner(System.in);

    int menuOption = 0;
    while (menuOption != 3) {
        menuOption = menu();

        if (menuOption == 1) {
            System.out.print("Input the width of the rectangle: ");
            double width = keyboard.nextDouble();
            System.out.print("Input the height of the rectangle: ");
            double height = keyboard.nextDouble();
            System.out.println("The area of the rectangle is "+ Rectangle.Area(width, height));
            System.out.println("The perimeter of the rectangle is "+ Rectangle.Perimeter(width, height));
        } else if (menuOption == 2) {
            System.out.print("Input the radius of the circle: ");
            double rad = keyboard.nextDouble();
            System.out.println("The area of the circle is "+ Circle.Area(rad));
            System.out.println("The circumference of the circle is "+ Circle.Circumference(rad));
        }
        System.out.println();
    }
}

Run:
Please select from the following menu:
1. Rectangle Properties
2. Circle Properties
3. Exit

Selection: 1

Input the width of the rectangle: 2
Input the height of the rectangle: 3
The area of the rectangle is 6.0
The perimeter of the rectangle is 10.0

Please select from the following menu:
1. Rectangle Properties
2. Circle Properties
3. Exit

Selection: 2

Input the radius of the circle: 2
The area of the circle is 12.566370614359172
The circumference of the circle is 12.566370614359172

Please select from the following menu:
1. Rectangle Properties
2. Circle Properties
3. Exit

Selection: 2

Input the radius of the circle: 10
The area of the circle is 314.1592653589793
The circumference of the circle is 62.83185307179586

Please select from the following menu:
1. Rectangle Properties
2. Circle Properties
3. Exit

Selection: 3
```
public class Triangle {
    public static double Area(double a, double b, double c) {
        double p = (a+b+c)/2;
        return Math.sqrt(p*(p-a)*(p-b)*(p-c));
    }

    public static double Perimeter(double a, double b, double c) {
        return a + b + c;
    }

    public static boolean isRight(double a, double b, double c) {
        boolean righttri = false;
        if (a*a+b*b == c*c) righttri = true;
        if (a*a+c*c == b*b) righttri = true;
        if (c*c+b*b == a*a) righttri = true;
        return righttri;
    }

    public static boolean isTriangle(double a, double b, double c) {
        boolean tri = true;
        // Find longest leg
        double longleg = a;
        if (b > longleg) longleg = b;
        if (c > longleg) longleg = c;
        // Check if the two shorter legs do add up to the length of the
        // longest leg.
        if (a+b+c-longleg <= longleg) tri = false;
        return tri;
    }
}

import java.util.Scanner;

public class MethodExample013 {
    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        System.out.print("Input the lengths of the sides of the triangle, a b c: ");
        double a = keyboard.nextDouble();
        double b = keyboard.nextDouble();
        double c = keyboard.nextDouble();
        if (Triangle.isTriangle(a,b,c)) {
            System.out.println("Area = " + Triangle.Area(a,b,c));
            System.out.println("Perimeter = " + Triangle.Perimeter(a, b, c));
            System.out.println("Right Triangle = " + Triangle.isRight(a, b, c));
        } else
            System.out.println("This is not a triangle.");
    }
}