Method Examples in Java

```
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 :-)
```

```java
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
```

```java
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
```

```java
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.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();

		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
```

```java
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
```

```java
import java.util.Scanner;

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.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;
               }
               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)
         {
            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

```
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

```
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

```
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;
   }
```

```
   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
```

Triangle.java

```
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;
   }
}
```

MethodExample013.java

```
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.");
   }
}
```