Q1 Request two numbers from the user and print the multiplication of the numbers.

IPO Model:

Input		Process		Output
• Number 1 • Number 2	→	• Calculate the multiplication of Number 1 and Number 2	→	• Multiplication of Number 1 and Number 2
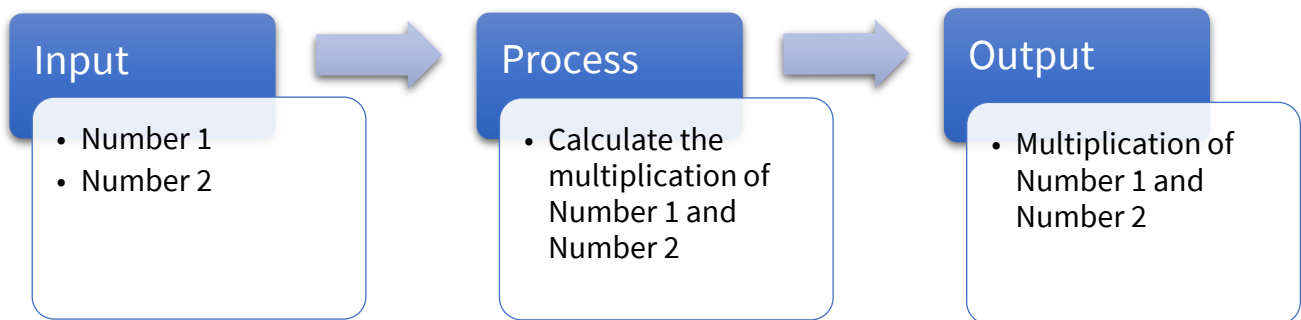
Pseudocode:

1. Get Number 1 from user.
2. Get Number 2 from user.
3. Calculate the multiplication of Number 1 and Number 2.
4. Print the result of the multiplication.

Flow Chart:

```
Start
  ↓
Get Number 1 from user  ←
  ↓
Is Number 1 a number?  —No→
  ↓ Yes
Get Number 2 from user  ←
  ↓
Is Number 2 a number?  —No→
  ↓ Yes
Calculate the multiplication of Number 1 and Number 2
  ↓
Print the result of the multiplication
  ↓
End
```
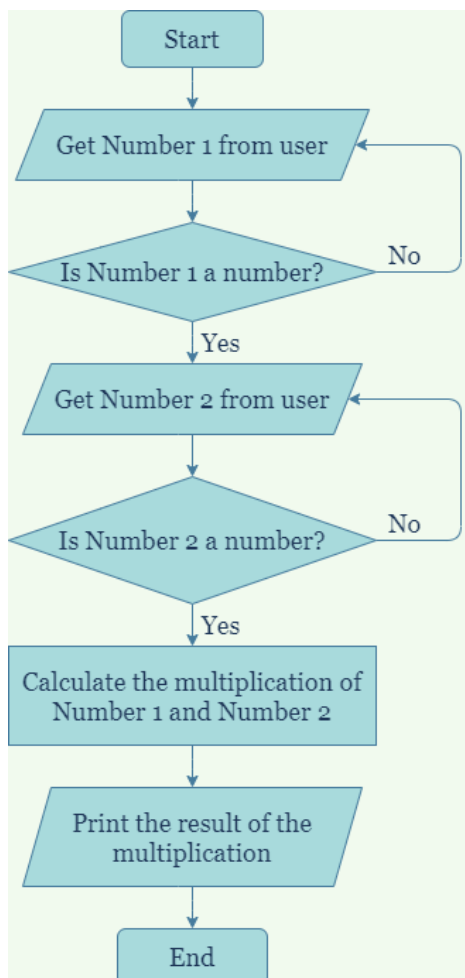
```java
public static void main(String[] args) {
    double num1, num2;
    Scanner scanner = new Scanner(System.in);

    while(true) {
        try {
            System.out.print("Enter Number 1 : ");
            num1 = Double.parseDouble(scanner.next());
            if(Double.isNaN(num1)) throw new NumberFormatException();
            break;
        } catch (NumberFormatException e) {
            System.out.println("Please enter a number.");
        }
    }

    while(true) {
        try {
            System.out.print("Enter Number 2 : ");
            num2 = Double.parseDouble(scanner.next());
            if(Double.isNaN(num2)) throw new NumberFormatException();
            break;
        } catch (NumberFormatException e) {
            System.out.println("Please enter a number.");
        }
    }
    System.out.println("Multiplication of Number 1 and Number 2 : " + num1 * num2);
}
```

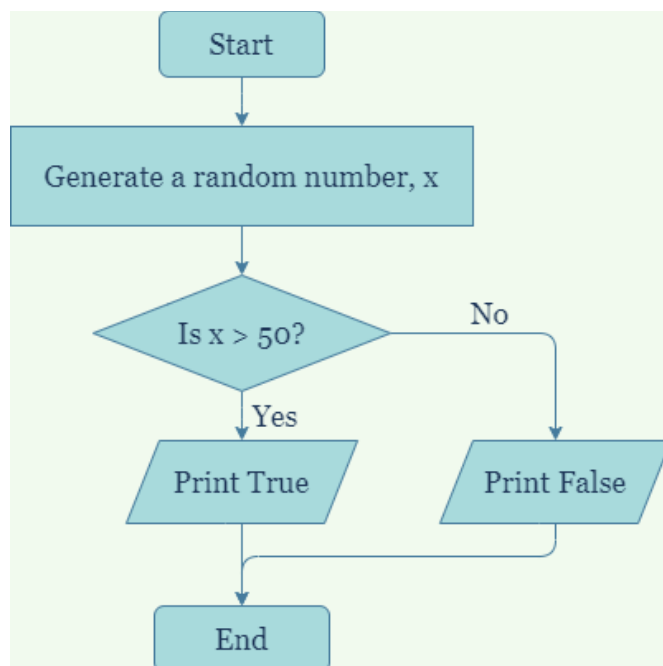Q2 Determine whether a random number is greater than 50.

IPO Model:

Input	Process	Output
• A random number	• Generate a random number, x • Determine if x > 50	• True/False
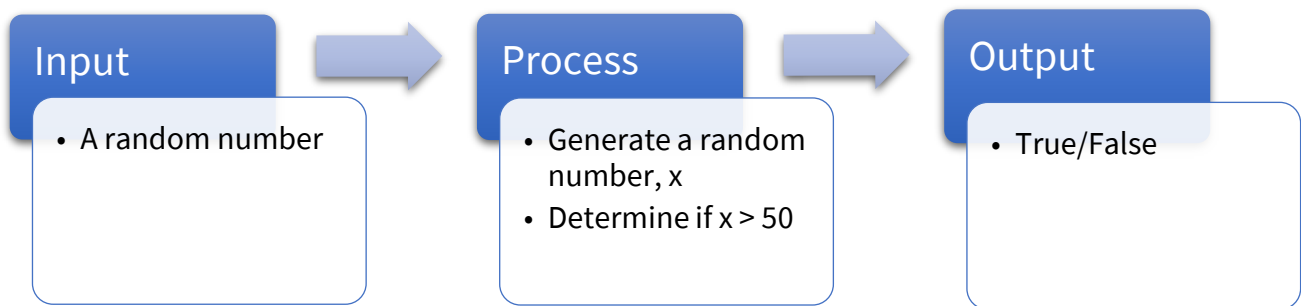
Pseudocode:

1. Generate a random number, x.
2. If x > 50, print True.
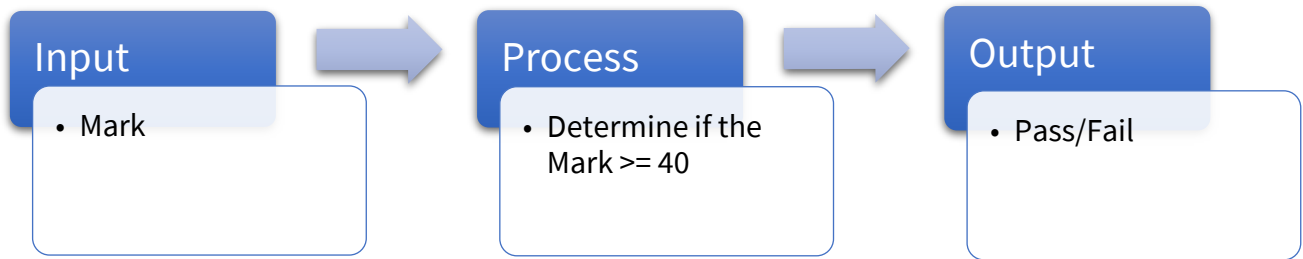3. Otherwise, print False.

Flow Chart:


```java
public static void main(String[] arg) {
    Random random = new Random();
    int x = random.nextInt( bound: 100);

    if (x > 50) System.out.println("True");
    else        System.out.println("False");
}
```

Q3 Print the pass/fail grade based on the mark entered by user. The passing mark is at least 40.
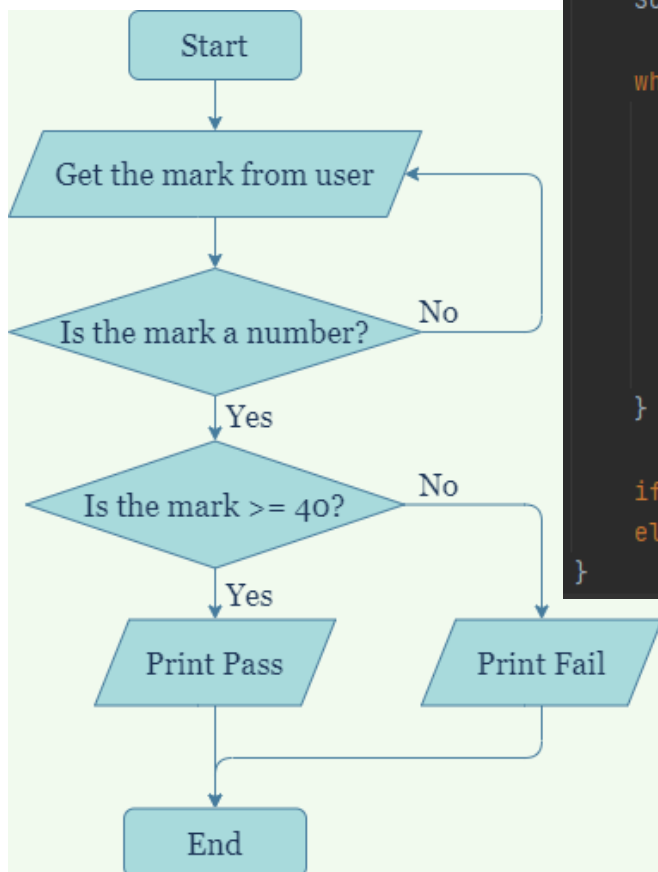
IPO Model:

Input	Process	Output
• Mark	• Determine if the Mark >= 40	• Pass/Fail

Pseudocode:

1. Get the mark from user.
2. If the mark >= 40, print Pass.
3. Otherwise, print Fail.
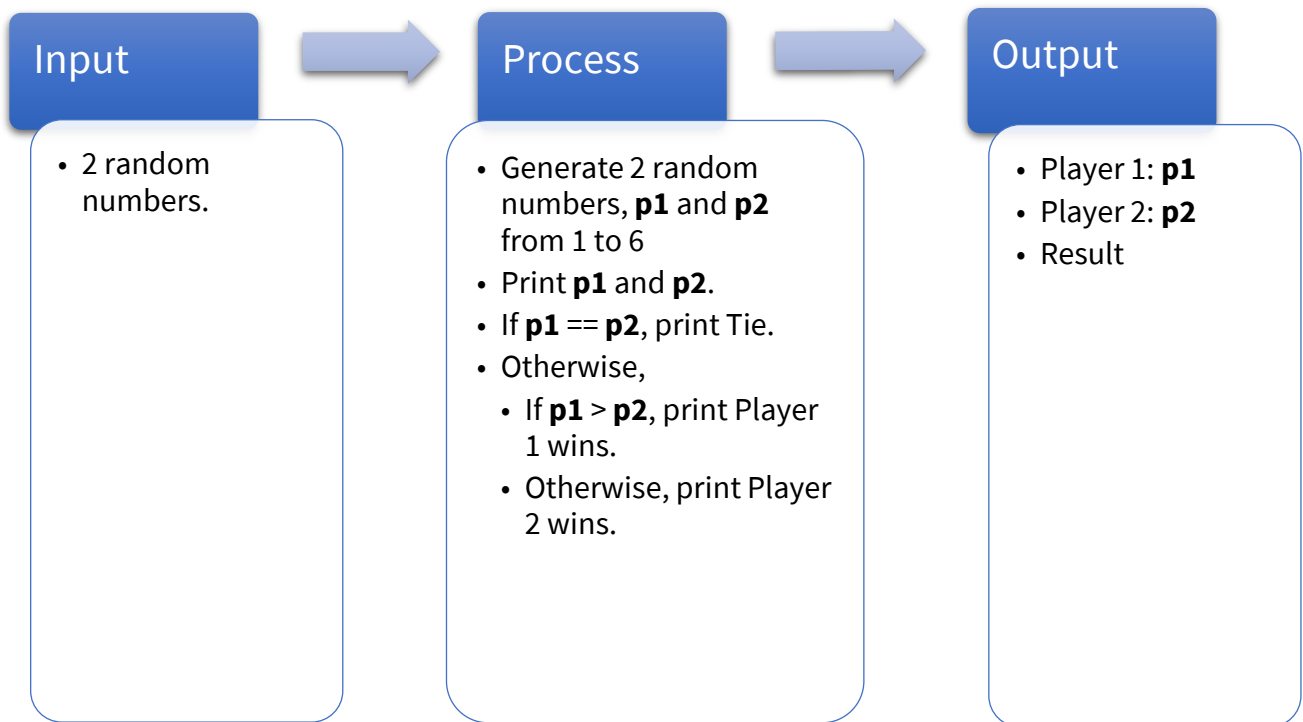
Flow Chart:


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

    while(true) {
        try {
            System.out.print("Enter the mark : ");
            mark = Integer.parseInt(scanner.next());
            break;
        } catch (NumberFormatException e) {
            System.out.println("Please enter a number.");
        }
    }

    if(mark >= 40) System.out.println("Pass");
    else            System.out.println("Fail");
}
```

Q4 Print the results of the two players' dice game.

IPO Model:

Input	Process	Output
• 2 random numbers.	• Generate 2 random numbers, **p1** and **p2** from 1 to 6 • Print **p1** and **p2**. • If **p1** == **p2**, print Tie. • Otherwise, • If **p1** > **p2**, print Player 1 wins. • Otherwise, print Player 2 wins.	• Player 1: **p1** • Player 2: **p2** • Result

Pseudocode:

1. Generate 2 random numbers, **p1** and **p2** from 1 to 6.
2. Print "Player 1: " and value of **p1**.
3. Print "Player 2: " and value of **p2**.
4. If **p1** == **p2**, print Tie.
5. Otherwise,
   a. If **p1** > **p2**, print Player 1 wins.
   b. Otherwise, print Player 2 wins.
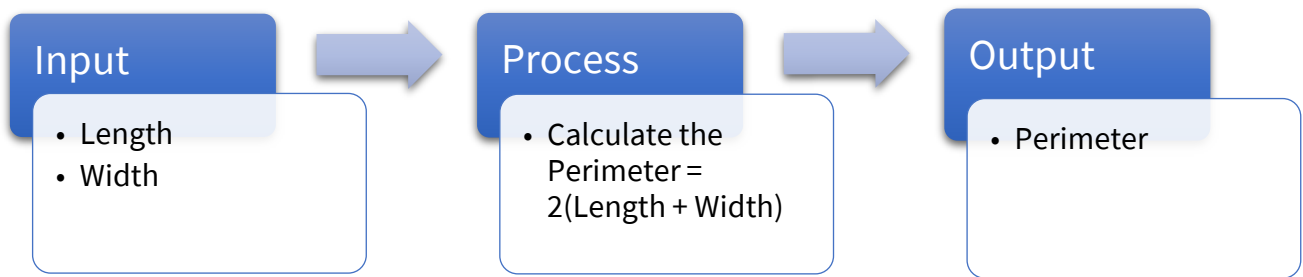
Flow Chart:
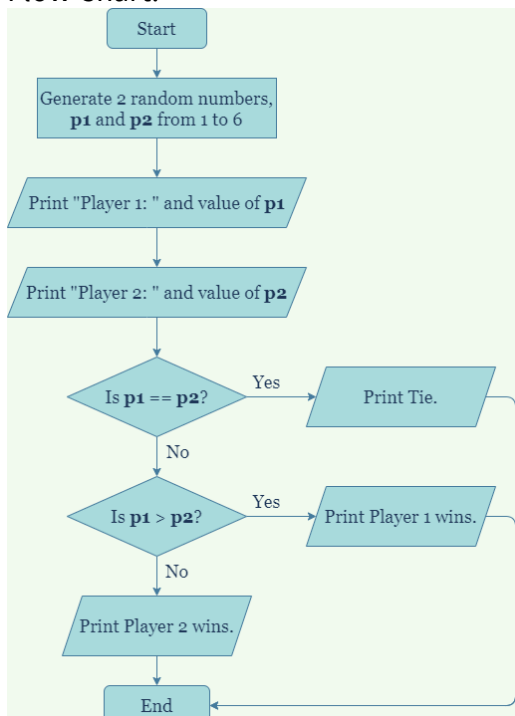

```java
public static void main(String[] arg) {
    Random random = new Random();
    int p1 = random.nextInt( bound: 6) + 1;
    int p2 = random.nextInt( bound: 6) + 1;

    System.out.println("Player 1 : " + p1);
    System.out.println("Player 2 : " + p2);

    if       (p1 == p2) System.out.println("Tie.");
    else if (p1 >  p2) System.out.println("Player 1 wins.");
    else                System.out.println("Player 2 wins.");
}
```
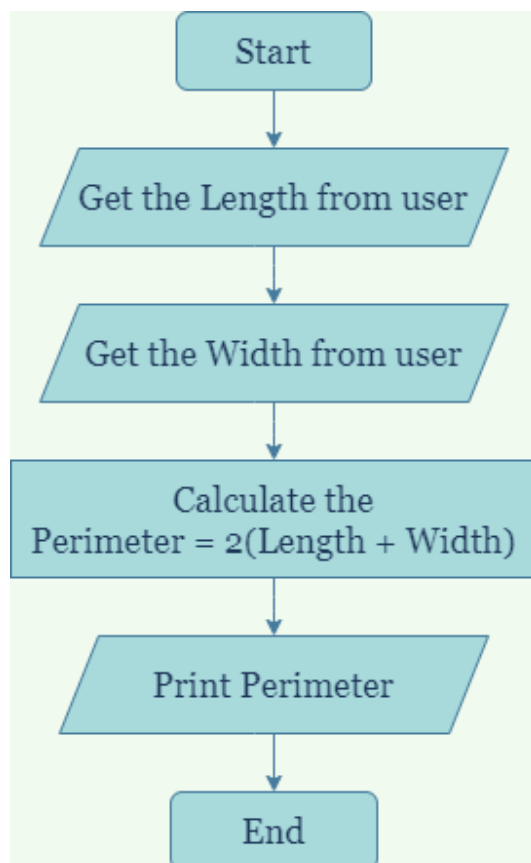
Q5 Print the perimeter of a rectangle.

IPO Model:

Input		Process		Output
• Length • Width	→	• Calculate the Perimeter = 2(Length + Width)	→	• Perimeter

Pseudocode:

1. Get the length from user.
2. Get the width from user.
3. Calculate the Perimeter = 2(Length + Width)
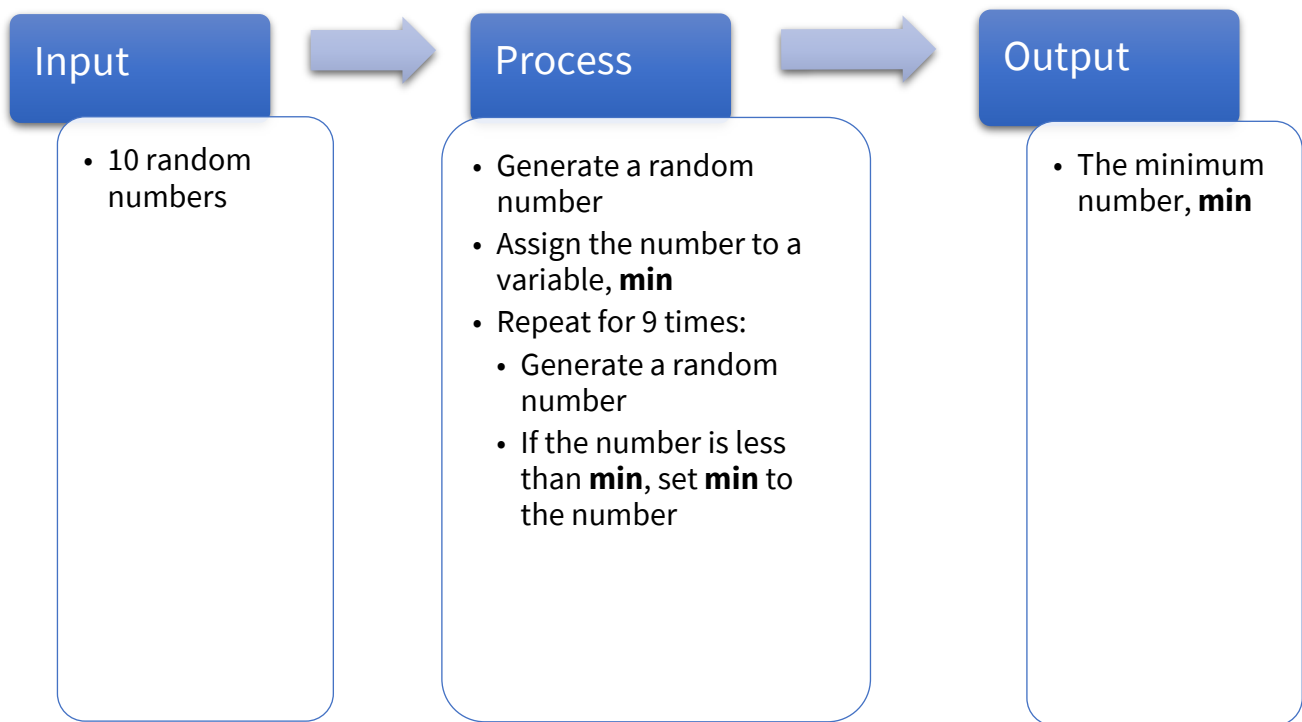4. Print the perimeter.

Flow Chart:


```java
public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);
    System.out.print("Length : ");
    double length = scanner.nextDouble();
    System.out.print("Width : ");
    double width  = scanner.nextDouble();
    double perimeter = 2 * (length + width);

    System.out.println(perimeter);
}
```

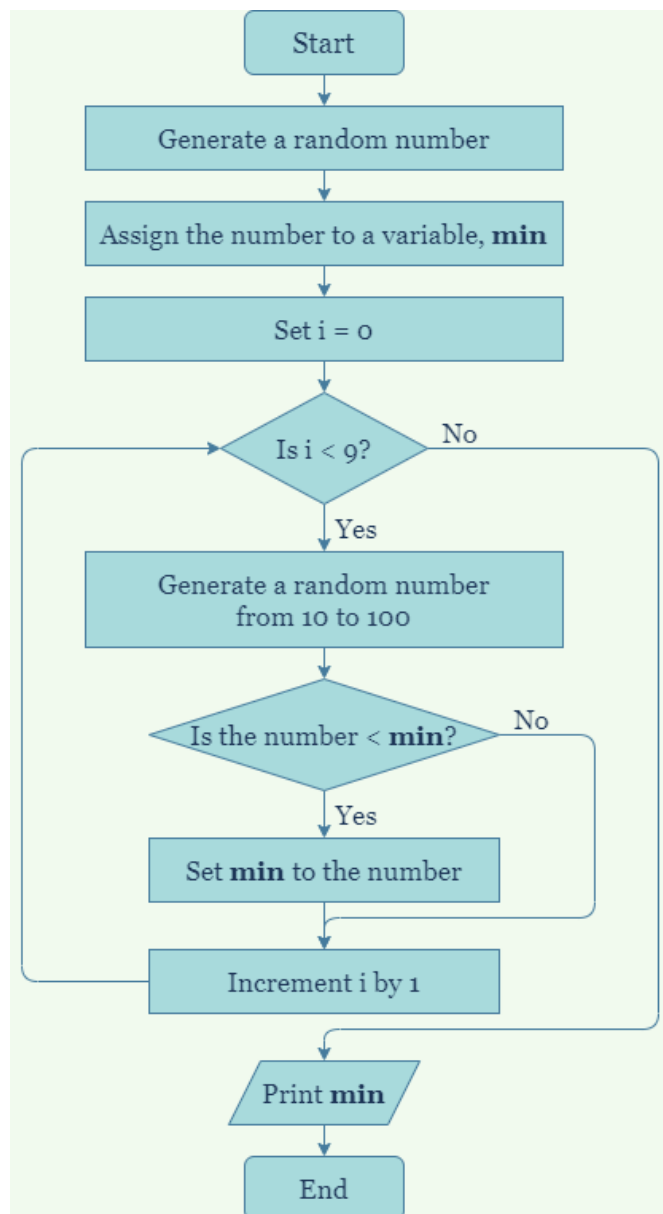Q6 Print the minimum number from 10 random numbers generated by computer.

IPO Model:

Input	Process	Output

• 10 random numbers	• Generate a random number
	• Assign the number to a variable, **min**
	• Repeat for 9 times:
	  • Generate a random number
	  • If the number is less than **min**, set **min** to the number
		• The minimum number, **min**

Pseudocode:

1. Generate a random number.
2. Assign the number to a variable, **min**.
3. Repeat for 9 times:
   a. Generate a random number.
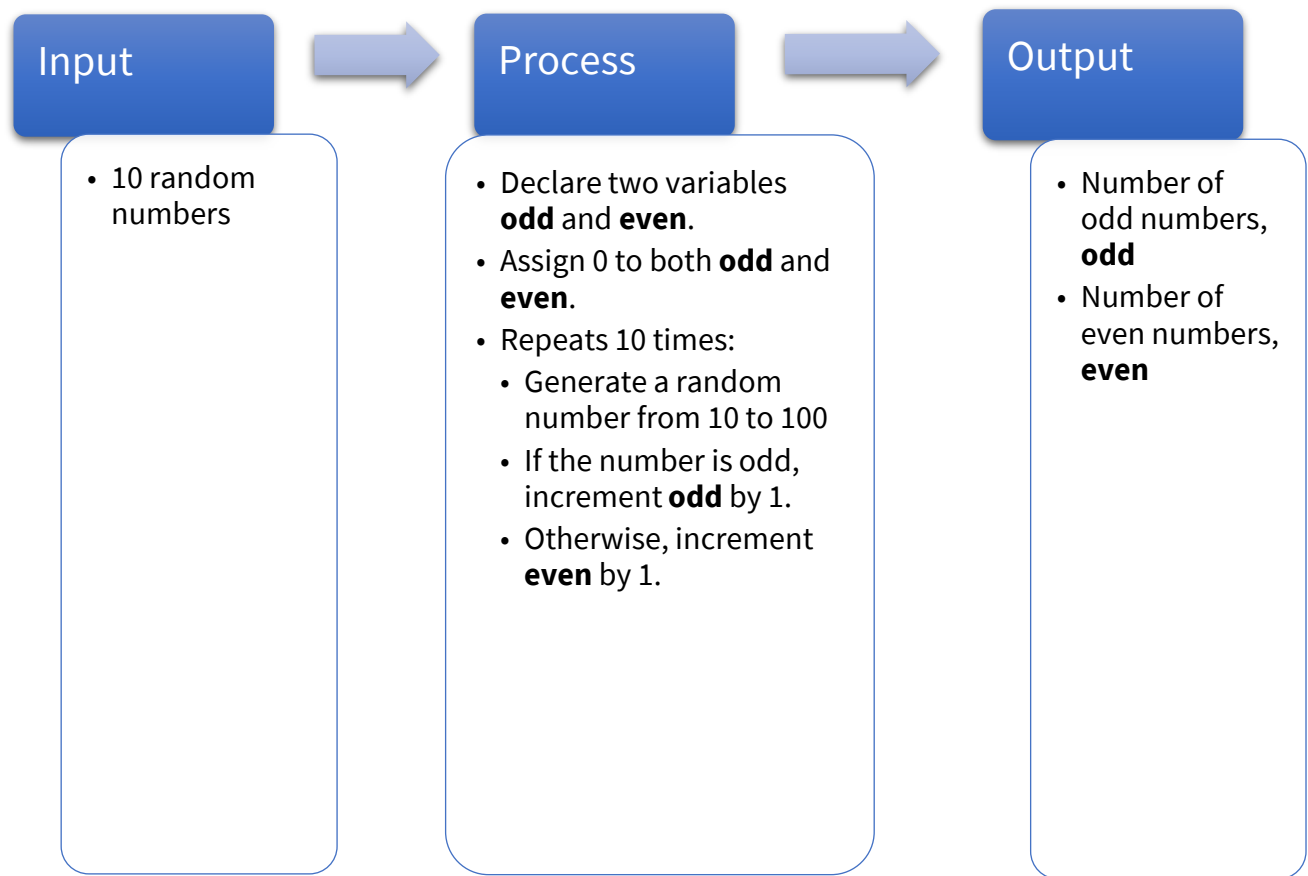   b. If the number is less than **min**, set **min** to the number.
4. Print **min**.

Flow Chart:


```java
public static void main(String[] args) {
    Random random = new Random();
    int min = random.nextInt( bound: 100);

    for (int i = 0; i < 9; i++) {
        int num = random.nextInt( bound: 100);
        if(num < min) min = num;
    }
    System.out.println(min);
}
```

Flowchart text:

- Start
- Generate a random number
- Assign the number to a variable, **min**
- Set i = 0
- Is i < 9? — No / Yes
- Generate a random number from 10 to 100
- Is the number < **min**? — No / Yes
- Set **min** to the number
- Increment i by 1
- Print **min**
- End

Q7 Print the number of odd and even number from 10 random numbers generated by computer. The random number must be from 10 – 100.

IPO Model:

| Input	Process	Output

• 10 random numbers	• Declare two variables **odd** and **even**.
	• Assign 0 to both **odd** and **even**.
	• Repeats 10 times:
	  • Generate a random number from 10 to 100
	  • If the number is odd, increment **odd** by 1.
	  • Otherwise, increment **even** by 1.
		• Number of odd numbers, **odd**
		• Number of even numbers, **even**

Pseudocode:

1. Declare two variables **odd** and **even**.
2. Assign 0 to both **odd** and **even**.
3. Repeats 10 times:
   a. Generate a random number from 10 to 100.
   b. If the number is odd, increment **odd** by 1.
   c. Otherwise, increment **even** by 1.
4. Print "Number of odd numbers: " and value of **odd**.
5. Print "Number of even numbers: " and value of **even**.

Flow Chart:
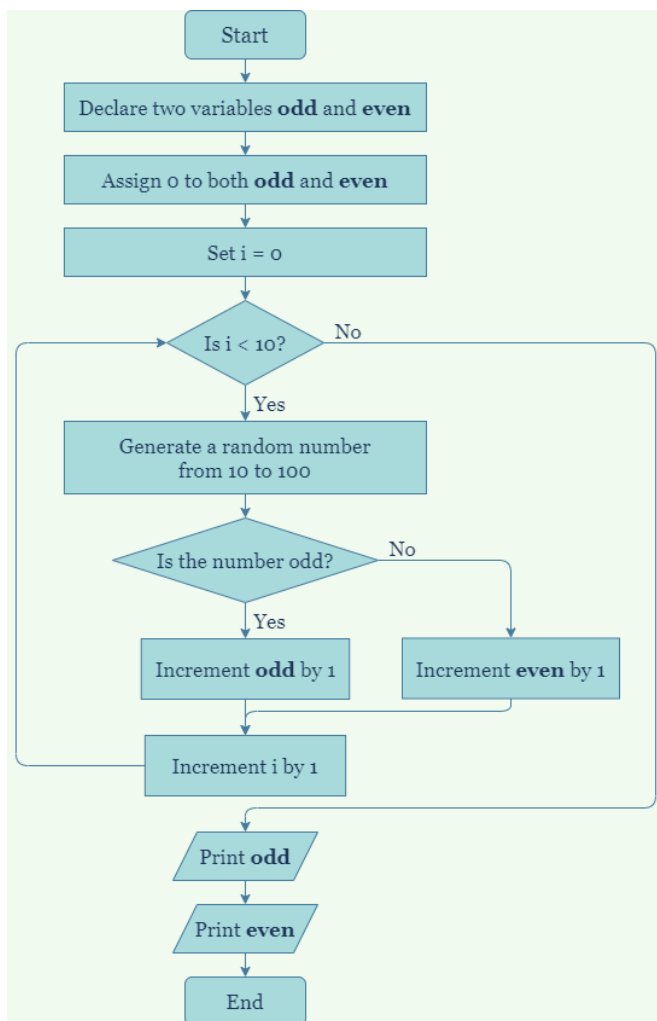

```java
public static void main(String[] args) {
    int odd = 0, even = 0;
    Random random = new Random();

    for (int i = 0; i < 10; i++) {
        int num = 10 + random.nextInt( bound: 91);
        if (num % 2 == 1) odd++;
        else                even++;
    }
    System.out.println("Number of odd numbers: " + odd);
    System.out.println("Number of even numbers: " + even);
}
```