LAB # 4

JAVA CONTROL STATEMENT

OBJECTIVE

To Study Java Control Statements and Math Classes.

THEORY

JAVA Control Statements

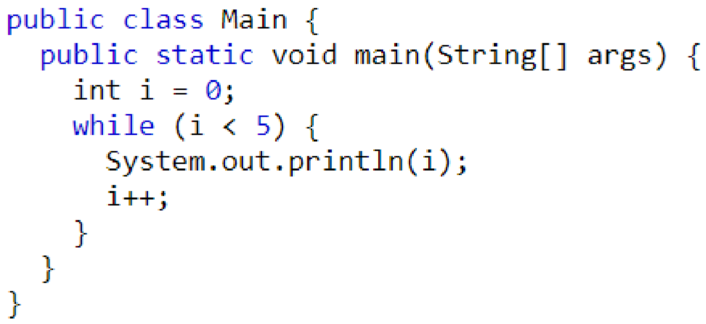
- Loops can execute a block of code as long as a specified condition is reached.
- Loops are handy because they save time, reduce errors, and they make code more readable.
- Java programming language provides the following types of loop to handle looping requirements.
  - **while loop**
  - **do/while loop**
  - **for loop**

❖ The While Loop

Repeats a statement or group of statements while a given condition is true. It tests the condition before executing the loop body. The while loop loops through a block of code as long as a specified condition is true:

Syntax

while(*condition*) {
// body of loop
}

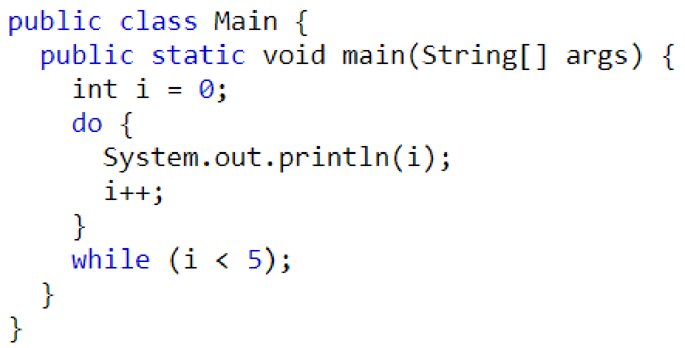


```
public class Main {
  public static void main(String[] args) {
    int i = 0;
    while (i < 5) {
      System.out.println(i);
      i++;
    }
  }
}
```

❖ The do-while Loop

The do/while loop is a variant of the while loop. This loop will execute the code block once, before checking if the condition is true, then it will repeat the loop as long as the condition is true.

do {
// body of loop
} while (*condition*);

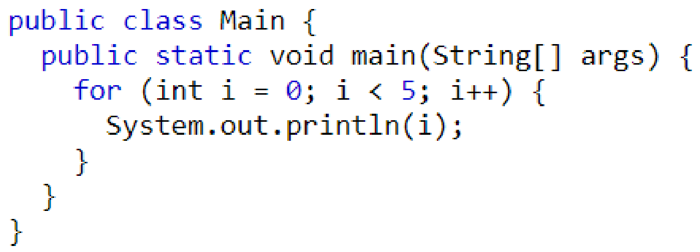


```
public class Main {
  public static void main(String[] args) {
    int i = 0;
    do {
      System.out.println(i);
      i++;
    }
    while (i < 5);
  }
}
```

❖ The for Loop

When you know exactly how many times you want to loop through a block of code, use the for loop instead of a while loop:

for(*initialization*; *condition*; *iteration*) {
// body
}



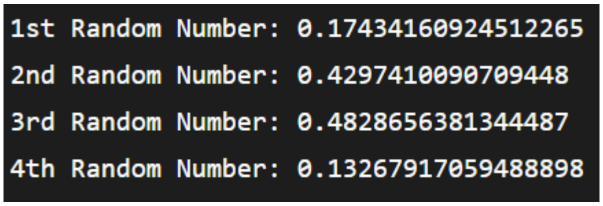
```
public class Main {
  public static void main(String[] args) {
    for (int i = 0; i < 5; i++) {
      System.out.println(i);
    }
  }
}
```

Math Classes

The **Math** class contains all the floating-point functions that are used for geometry and trigonometry, as well as several general-purpose methods. **Math** defines two **double** constants: **E** (approximately 2.72) and **PI** (approximately 3.14).

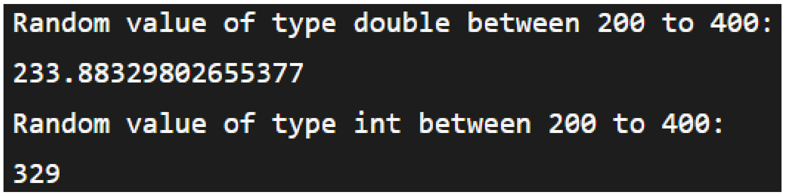
The Java Math library function Math.random() generates a double value in the range (0,1). Notice this range does not include the 1.

```
import java.lang.Math;
public class RandomNumber1
{
public static void main(String args[])
{
// Generating random numbers
System.out.println("1st Random Number: " + Math.random());
System.out.println("2nd Random Number: " + Math.random());
System.out.println("3rd Random Number: " + Math.random());
System.out.println("4th Random Number: " + Math.random());
}
}
```



```
1st Random Number: 0.17434160924512265
2nd Random Number: 0.4297410090709448
3rd Random Number: 0.4828656381344487
4th Random Number: 0.13267917059488898
```

```
public class RandomNumber2
{
public static void main( String args[] )
{
int min = 200;
int max = 400;
//Generate random double value from 200 to 400
System.out.println("Random value of type double between "+min+" to "+max+ ":");
double a = Math.random()*(max-min+1)+min;
System.out.println(a);
//Generate random int value from 200 to 400
System.out.println("Random value of type int between "+min+" to "+max+ ":");
int b = (int)(Math.random()*(max-min+1)+min);
System.out.println(b);
}
}
```



```
Random value of type double between 200 to 400:
233.88329802655377
Random value of type int between 200 to 400:
329
```

LAB TASK

1. Write a program to generate Fibonacci hypothesis for 19 generations given below.

    0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765

2. Write a program to convert given no. of days into months and days.
    (Assume that each month is of 30 days)
    Example :
    Input - 69
    Output - 69 days = 2 Month and 9 days */

3. Write a program that generates Absolute value, square root, power, exp, radian, max, min, and random.
    Hint: double num = -4876.1874d;
    double x=10.0,y=20.0;
    int max=15;