

Control Statements in Java

Aim:

To understand and implement decision-making and looping control statements in Java.

PRE LAB EXERCISE

QUESTIONS

- ✓ List different control statements in Java.

Control statements control the **flow of execution** of a program. They are classified into:

a) Selection (Decision) Statements

If, if–else, else–if ladder, switch

b) Iteration (Looping) Statements

for, while, do–while

c) Jump (Branching) Statements

Break, continue, return

- ✓ Difference between for, while, and do-while loops.

| Feature | for loop | while loop | do-while loop |
|------------------------|----------------------------|-------------------------------|-----------------------------|
| Condition check | Before loop starts | Before loop starts | After loop executes |
| Executes at least once | ✗ No | ✗ No | ✓ Yes |
| Best used when | Number of iterations known | Iterations unknown | Loop must run at least once |
| Example use | Printing 1 to 10 | Reading input until condition | Menu-driven programs |

- ✓ What is the use of break and continue?
- ✓ **break:** Immediately terminates the loop or switch statement and transfers control outside it.
- continue:** Skips the current iteration of a loop and continues with the next iteration.

IN LAB EXERCISE

Objective:

To implement if-else and looping statements.

INPUT STATEMENT:

SCANNER CLASS

- ✓ The Scanner class in Java is used to read input from the user through the keyboard. It is available in the package java.util.
- ✓ The Scanner object reads different types of input such as integer, float, double, and string and stores them in variables.
- ✓ To use the Scanner class, it must be imported before using it in the program.

SYNTAX:

- ✓ `Scanner sc = new Scanner(System.in);`

Commonly Used Scanner Methods:

- ✓ `nextInt()` – reads an integer value
- ✓ `nextFloat()` – reads a float value
- ✓ `nextDouble()` – reads a double value
- ✓ `next()` – reads a single word
- ✓ `nextLine()` – reads a complete line of text
- ✓

PROGRAMS:

Program 1: Check Whether a Number is Positive

```
class PositiveNumber {  
    public static void main(String[] args) {  
        int n = 5;  
        if (n > 0) {  
            System.out.println("Positive Number");  
        }  
    }  
}
```

Output:

```
PS C:\PRITHI\java files> javac positivenum.java
PS C:\PRITHI\java files> java positivenum.java
Enter n:32
n is positive.
```

Program 2: Check Whether a Number is Even or Odd

```
class EvenOdd {
    public static void main(String[] args) {
        int n = 6;
        if (n % 2 == 0)
            System.out.println("Even Number");
        else
            System.out.println("Odd Number");
    }
}
```

Output:

```
PS C:\PRITHI\java files> java evenodd.java
Enter a: 65
a is odd
```

Program 3: Find Largest of Two Numbers

```
class LargestTwo {
    public static void main(String[] args) {
        int a = 10, b = 20;
        if (a > b)
            System.out.println("A is largest");
        else
            System.out.println("B is largest");
    }
}
```

```
}
```

Output:

```
PS C:\PRITHI\java files> javac largesttwo.java
PS C:\PRITHI\java files> java largesttwo.java
Enter a: 7
Enter b: 67
b is greater
```

Program 4: Grade Calculation

```
class Grade {
    public static void main(String[] args) {
        int marks = 75;
        if (marks >= 90)
            System.out.println("Grade A");
        else if (marks >= 75)
            System.out.println("Grade B");
        else if (marks >= 50)
            System.out.println("Grade C");
        else
            System.out.println("Fail");
    }
}
```

Output:

```
PS C:\PRITHI\java files> javac grade.java
PS C:\PRITHI\java files> java grade.java
Grade B
```

Program 5: Day of the Week

```
class DaySwitch {
    public static void main(String[] args) {
        int day = 3;
```

```
switch (day) {  
    case 1: System.out.println("Monday"); break;  
    case 2: System.out.println("Tuesday"); break;  
    case 3: System.out.println("Wednesday"); break;  
    case 4: System.out.println("Thursday"); break;  
    case 5: System.out.println("Friday"); break;  
    default: System.out.println("Invalid Day");  
}  
}  
}
```

Output:

```
PS C:\PRITHI\java files> javac day.java  
PS C:\PRITHI\java files> java day.java  
Wednesday
```

Program 6: Print Numbers from 1 to 5

```
class ForLoop {  
    public static void main(String[] args) {  
        for (int i = 1; i <= 5; i++) {  
            System.out.println(i);  
        }  
    }  
}
```

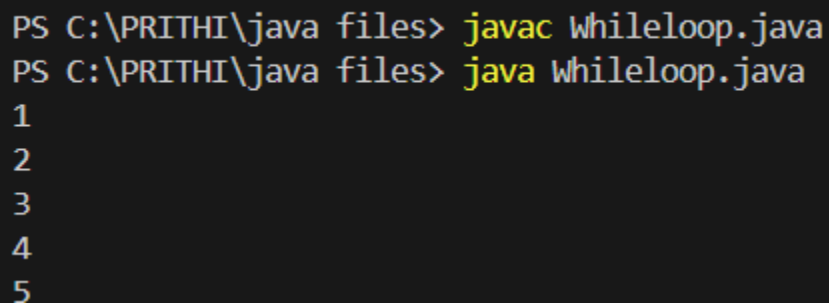
Output:

```
PS C:\PRITHI\java files> javac printnum.java  
PS C:\PRITHI\java files> java printnum.java  
0  
1  
2  
3  
4  
5  
6  
7
```

Program 7: Print Numbers from 1 to 5

```
class WhileLoop {  
    public static void main(String[] args) {  
        int i = 1;  
        while (i <= 5) {  
            System.out.println(i);  
            i++;  
        }  
    }  
}
```

Output:



```
PS C:\PRITHI\java files> javac whileloop.java  
PS C:\PRITHI\java files> java whileloop.java  
1  
2  
3  
4  
5
```

Program 8: Print Numbers from 1 to 5

```
class DoWhileLoop {  
    public static void main(String[] args) {  
        int i = 1;  
        do {  
            System.out.println(i);  
            i++;  
        } while (i <= 5);  
    }  
}
```

Output:

```
PS C:\PRITHI\java files> javac dowhileloop.java
PS C:\PRITHI\java files> java dowhileloop.java
1
2
3
4
5
6
7
8
```

Program 9: Sum of First 5 Natural Numbers

```
class SumNumbers {
    public static void main(String[] args) {
        int sum = 0;
        for (int i = 1; i <= 5; i++) {
            sum = sum + i;
        }
        System.out.println("Sum = " + sum);
    }
}
```

Output:

```
PS C:\PRITHI\java files> javac sumnatural.java
PS C:\PRITHI\java files> java sumnatural.java
Sum: 21
```

Program 10: Multiplication Table of a Number

```
class MultiplicationTable {
    public static void main(String[] args) {
        int n = 5;
        for (int i = 1; i <= 10; i++) {
            System.out.println(n + " x " + i + " = " + (n * i));
        }
    }
}
```

```
}  
}
```

Output:

```
PS C:\PRITHI\java files> javac multiplicationtable.java  
PS C:\PRITHI\java files> java multiplicationtable.java  
5 x 1 = 5  
5 x 2 = 10  
5 x 3 = 15  
5 x 4 = 20  
5 x 5 = 25  
5 x 6 = 30  
5 x 7 = 35  
5 x 8 = 40  
5 x 9 = 45  
5 x 10 = 50
```

POST LAB EXERCISE

- ✓ What is the use of if statement?
The if statement is used to **execute a block of code when a condition is true.**
- ✓ Difference between if-else and else-if ladder.

| if-else | else-if ladder |
|-----------------------------------|-----------------------------------|
| Checks only two conditions | Checks multiple conditions |
| Has one if and one else | Has one if and many else if |
| Used for simple decisions | Used for multiple choices |
- ✓ Why is switch statement used?
The switch statement is used to **select one block of code from many options** based on a single value, making the code **cleaner and easier to read.**

- ✓ Difference between for, while, and do-while loops.

| Loop | Condition Check | Use |
|----------|-----------------|------------------------------------|
| for | Before loop | When number of iterations is known |
| while | Before loop | When iterations are not fixed |
| do-while | After loop | Executes at least once |

- ✓ Which loop executes at least once?

The **do-while loop** executes at least once because the condition is checked **after** the loop body.

Result:

Thus the different control statements were executed successfully with expected output.

ASSESSMENT

| Description | Max Marks | Marks Awarded |
|--------------------------|-----------|---------------|
| Pre Lab Exercise | 5 | |
| In Lab Exercise | 10 | |
| Post Lab Exercise | 5 | |
| Viva | 10 | |
| Total | 30 | |
| Faculty Signature | | |