Experiment Number : 03 **Date:**

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.

Types of Control Statements

1. **Selection Statements:** `if`, `if-else`, `switch` (Used for decision making).
2. **Iteration Statements (Loops):** `for`, `while`, `do-while` (Used for repeating code).
3. **Jump Statements:** `break`, `continue`, `return`.

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

Loop	Type	When to use?
for	Entry-controlled	When you know exactly how many times to repeat.
while	Entry-controlled	When you don't know the count, but have a condition.
do-while	**Exit-controlled**	When the code **must** run at least once, even if the condition is false.

- ✓ What is the use of break and continue?

- **`break`:** Immediately exits the entire loop or switch block.
- **`continue`:** Skips the current iteration and jumps to the next "round" of the loop.

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:

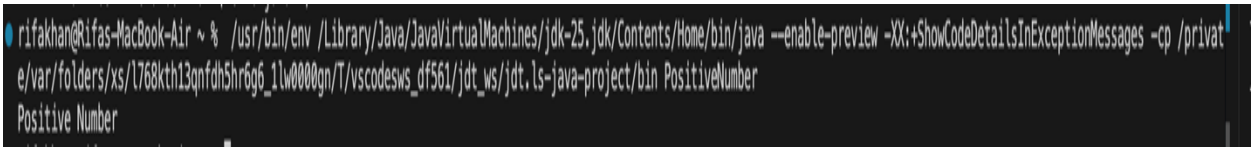
Program 1: Check Whether a Number is Positive

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

}

Output:

Positive Number

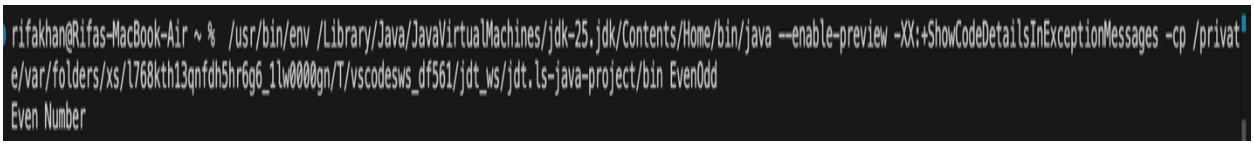


Program 2: Check Whether a Number is Even or Odd

```
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:

Even Number



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:

B is largest

```
rifakhan@Rifas-MacBook-Air ~ %  /usr/bin/env /Library/Java/JavaVirtualMachines/jdk-25.jdk/Contents/Home/bin/java --enable-preview -XX:+ShowCodeDetailsInExceptionMessages -cp /privat
e/var/folders/xs/l768kth13qnfdh5hr6g6_1lw0000gn/T/vscodesws_df561/jdt_ws/jdt.ls-java-project/bin LargestTwo
B is largest
```

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:

Grade B

```
rifakhan@Rifas-MacBook-Air ~ %  /usr/bin/env /Library/Java/JavaVirtualMachines/jdk-25.jdk/Contents/Home/bin/java --enable-preview -XX:+ShowCodeDetailsInExceptionMessages -cp /privat
e/var/folders/xs/l768kth13qnfdh5hr6g6_1lw0000gn/T/vscodesws_df561/jdt_ws/jdt.ls-java-project/bin Grade
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:

Wednesday

```
rifakhan@Rifas-MacBook-Air ~ %  /usr/bin/env /Library/Java/JavaVirtualMachines/jdk-25.jdk/Contents/Home/bin/java --enable-preview -XX:+ShowCodeDetailsInExceptionMessages -cp /privat
e/var/folders/xs/l768kth13qnfdh5hr6g6_1lw0000gn/T/vscodesws_df561/jdt_ws/jdt.ls-java-project/bin DaySwitch
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:

1

2

3

4

5

```
rifakhan@Rifas-MacBook-Air ~ %  /usr/bin/env /Library/Java/JavaVirtualMachines/jdk-25.jdk/Contents/Home/bin/java --enable-preview -XX:+ShowCodeDetailsInExceptionMessages -cp /privat
e/var/folders/xs/l768kth13qnfdh5hr6g6_1lw0000gn/T/vscodesws_df561/jdt_ws/jdt.ls-java-project/bin ForLoop
1
2
3
4
5
```

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:

1

2

3

4

5

```
rifakhan@Rifas-MacBook-Air ~ %  /usr/bin/env /Library/Java/JavaVirtualMachines/jdk-25.jdk/Contents/Home/bin/java --enable-preview -XX:+ShowCodeDetailsInExceptionMessages -cp /privat
e/var/folders/xs/l768kth13qnfdh5hr6g6_1lw0000gn/T/vscodesws_df561/jdt_ws/jdt.ls-java-project/bin WhileLoop
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:

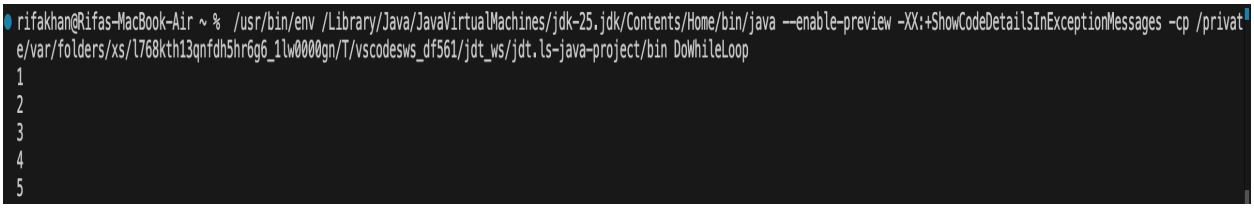
1

2

3

4

5



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;

}

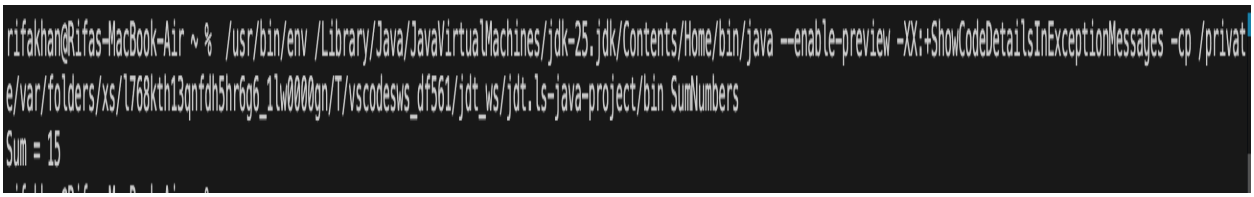
System.out.println("Sum = " + sum);

}

}

Output:

Sum = 15



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:

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

```
rifakhan@Rifas-MacBook-Air ~ %  /usr/bin/env /Library/Java/JavaVirtualMachines/jdk-25.jdk/Contents/Home/bin/java --enable-preview -XX:+ShowCodeDetailsInExceptionMessages -cp /privat
e/var/folders/xs/l768kth13qnfdh5hr6g6_1lw0000gn/T/vscodesws_df561/jdt_ws/jdt.ls-java-project/bin MultiplicationTable
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?

It is used to execute a specific block of code only when a given condition is **true**.

- ✓ Difference between if-else and else-if ladder.

• **`if-else`**: Chooses between **two** paths. If the condition is true, the `if` block runs; otherwise, the `else` block runs.

• **`else-if` ladder**: Chooses between **multiple** paths. It checks several conditions one by one until it finds one that is true.

- ✓ Why is switch statement used?

It is used for **multi-way branching**. It is often cleaner and more readable than a long `else-if` ladder when you are comparing a single variable against several constant values.

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

Difference between `for`, `while`, and `do-while` loops:

- **`for`**: Best when you know the exact number of iterations (e.g., counting 1 to 10).
- **`while`**: Best when you don't know the count and want to loop as long as a condition remains true.

- **`do-while`**: Similar to `while`, but the condition is checked **after** the code runs.

✓ Which loop executes at least once?

The **`do-while`** loop, because it is an "exit-controlled" loop—it runs the body first and checks the condition second.

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		