

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 are used to control the flow of execution of a program.
Java control statements are classified into selection, iteration, and jump statements.
Selection statements include if, if-else, and switch.
Iteration statements include for, while, and do-while.
Jump statements include break, continue, and return.
- ✓ Difference between for, while, and do-while loops.
The for loop is used when the number of iterations is known beforehand.
The while loop checks the condition before executing the loop body.
The do-while loop executes the loop body at least once.
In do-while, the condition is checked after the loop body.
- ✓ What is the use of break and continue?
The break statement is used to terminate a loop or switch statement.
It transfers control to the statement following the loop.
The continue statement skips the remaining statements of the current iteration.
After continue, the loop proceeds 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

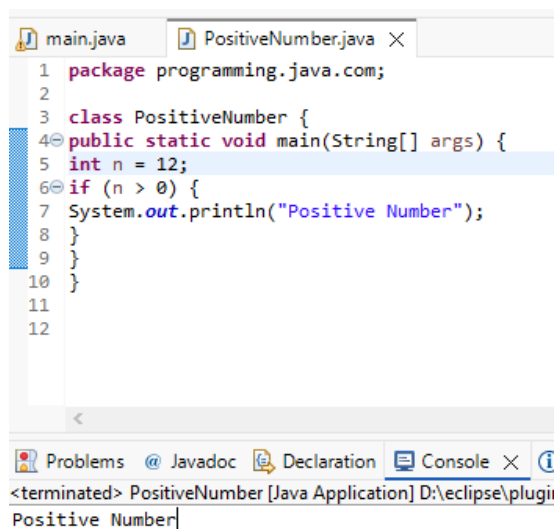
PROGRAMS:

Program 1: Check Whether a Number is Positive

```
class PositiveNumber {  
  
    public static void main(String[] args) {  
  
        int n = 12;  
  
        if (n > 0) {  
  
            System.out.println("Positive Number");  
  
        }  
  
    }  
  
}
```

Output:

Positive Number



The screenshot shows the Eclipse IDE with two tabs: 'main.java' and 'PositiveNumber.java'. The 'PositiveNumber.java' tab is active, displaying the following code:

```
1 package programming.java.com;  
2  
3 class PositiveNumber {  
4     public static void main(String[] args) {  
5         int n = 12;  
6         if (n > 0) {  
7             System.out.println("Positive Number");  
8         }  
9     }  
10 }  
11  
12
```

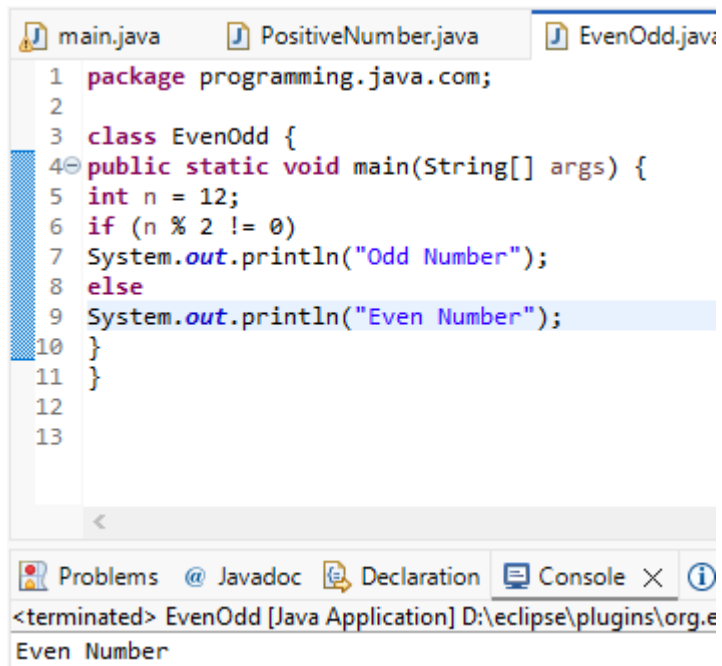
At the bottom, the 'Console' tab is active, showing the output: '<terminated> PositiveNumber [Java Application] D:\eclipse\plugin Positive Number'.

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



```
1 package programming.java.com;  
2  
3 class EvenOdd {  
4 public static void main(String[] args) {  
5     int n = 12;  
6     if (n % 2 != 0)  
7         System.out.println("Odd Number");  
8     else  
9         System.out.println("Even Number");  
10 }  
11 }  
12  
13
```

Problems @ Javadoc Declaration Console × ⓘ

<terminated> EvenOdd [Java Application] D:\eclipse\plugins\org.e

Even Number

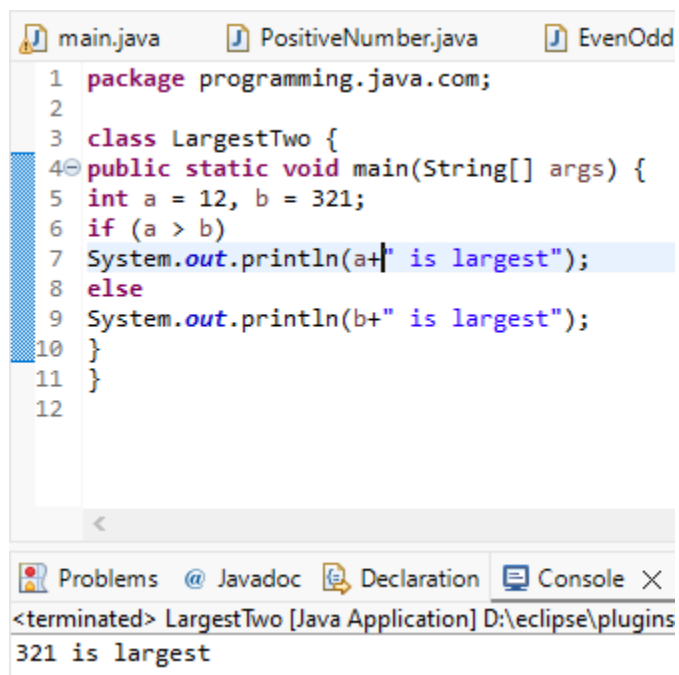
Program 3: Find Largest of Two Numbers

```
class LargestTwo {  
    public static void main(String[] args) {  
        int a = 12, b = 321;
```

```
if (a > b)
System.out.println("A is largest");
else
System.out.println("B is largest");
}
}
```

Output:

321 is largest

A screenshot of the Eclipse IDE. The top editor shows a file named 'main.java' with the following code:

```
1 package programming.java.com;
2
3 class LargestTwo {
4     public static void main(String[] args) {
5         int a = 12, b = 321;
6         if (a > b)
7             System.out.println(a+" is largest");
8         else
9             System.out.println(b+" is largest");
10    }
11 }
12
```

The bottom editor shows the 'Console' tab with the output:

```
<terminated> LargestTwo [Java Application] D:\eclipse\plugins
321 is largest
```

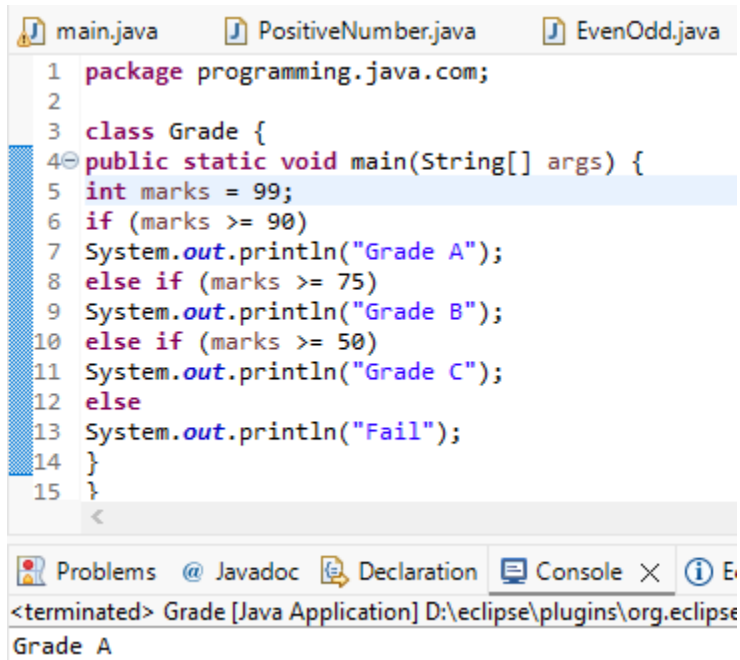
Program 4: Grade Calculation

```
class Grade {
public static void main(String[] args) {
int marks = 99;
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 A



The screenshot shows the Eclipse IDE with three tabs: main.java, PositiveNumber.java, and EvenOdd.java. The main.java tab is active, displaying the following code:

```
1 package programming.java.com;  
2  
3 class Grade {  
4     public static void main(String[] args) {  
5         int marks = 99;  
6         if (marks >= 90)  
7             System.out.println("Grade A");  
8         else if (marks >= 75)  
9             System.out.println("Grade B");  
10        else if (marks >= 50)  
11            System.out.println("Grade C");  
12        else  
13            System.out.println("Fail");  
14        }  
15    }  
<
```

Below the code editor, the Console tab is visible, showing the output: <terminated> Grade [Java Application] D:\eclipse\plugins\org.eclipse Grade A.

Program 5: Day of the Week

```
class DaySwitch {  
    public static void main(String[] args) {  
        int day = 7;  
        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;
```

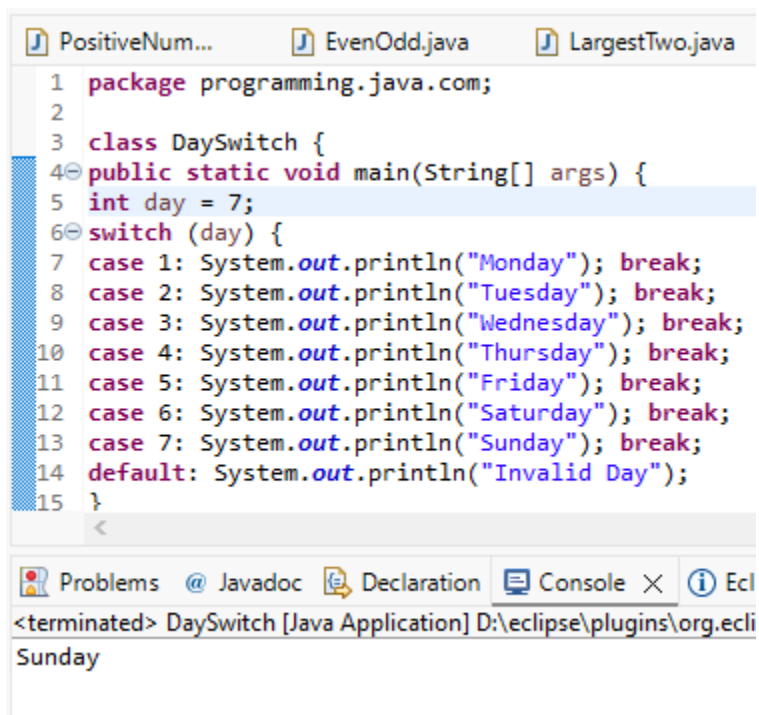
```

    case 6: System.out.println("Saturday"); break;
    case 7: System.out.println("Sunday"); break;
    default: System.out.println("Invalid Day");
}
}
}

```

Output:

Wednesday



The screenshot shows the Eclipse IDE with three tabs: 'PositiveNum...', 'EvenOdd.java', and 'LargestTwo.java'. The 'EvenOdd.java' tab is active, displaying the following code:

```

1 package programming.java.com;
2
3 class DaySwitch {
4     public static void main(String[] args) {
5         int day = 7;
6         switch (day) {
7             case 1: System.out.println("Monday"); break;
8             case 2: System.out.println("Tuesday"); break;
9             case 3: System.out.println("Wednesday"); break;
10            case 4: System.out.println("Thursday"); break;
11            case 5: System.out.println("Friday"); break;
12            case 6: System.out.println("Saturday"); break;
13            case 7: System.out.println("Sunday"); break;
14            default: System.out.println("Invalid Day");
15        }
16    }
17 }

```

At the bottom, the 'Console' tab is active, showing the output: '<terminated> DaySwitch [Java Application] D:\eclipse\plugins\org.ecli' followed by 'Sunday' on a new line.

Program 6: Print Numbers from 1 to 5

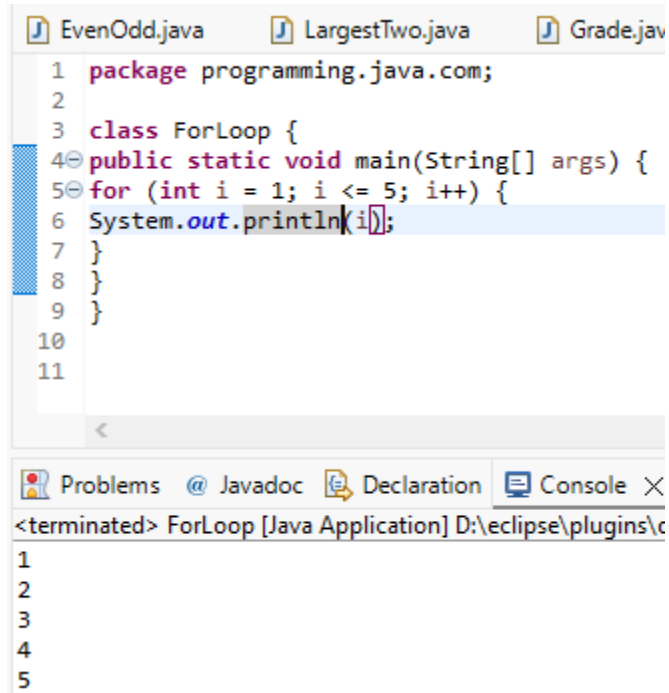
```

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



```
1 package programming.java.com;
2
3 class ForLoop {
4     public static void main(String[] args) {
5         for (int i = 1; i <= 5; i++) {
6             System.out.println(i);
7         }
8     }
9 }
10
11
```

<terminated> ForLoop [Java Application] D:\eclipse\plugins\c

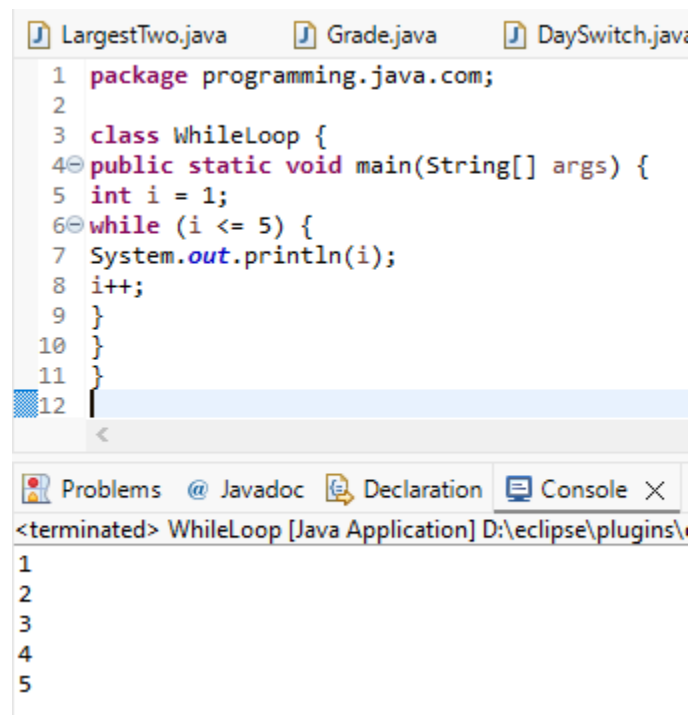
1
2
3
4
5

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



The screenshot shows the Eclipse IDE with a Java project. The editor displays a file named 'WhileLoop.java' with the following code:

```
1 package programming.java.com;
2
3 class WhileLoop {
4     public static void main(String[] args) {
5         int i = 1;
6         while (i <= 5) {
7             System.out.println(i);
8             i++;
9         }
10    }
11 }
12
```

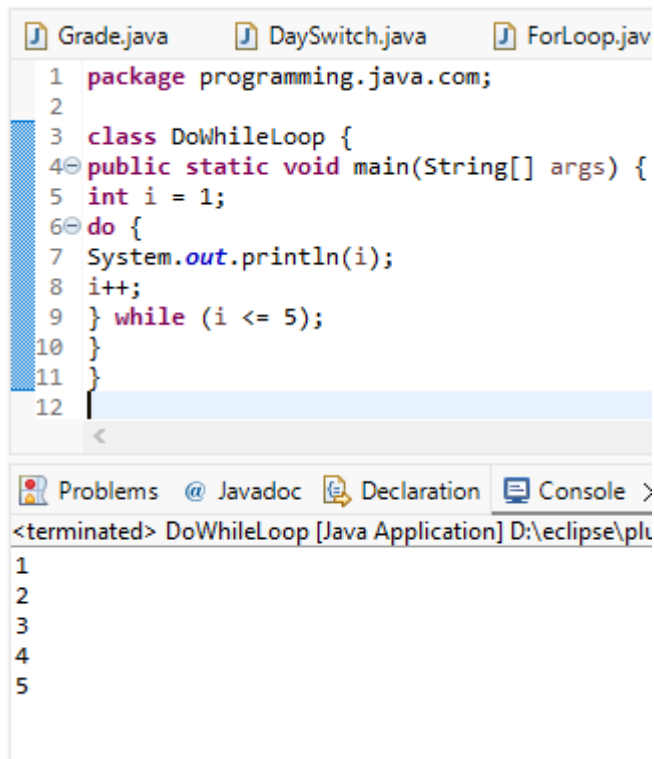
The console output at the bottom shows the numbers 1 through 5, each on a new line, indicating the program executed successfully.

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



```
1 package programming.java.com;
2
3 class DoWhileLoop {
4     public static void main(String[] args) {
5         int i = 1;
6         do {
7             System.out.println(i);
8             i++;
9         } while (i <= 5);
10    }
11 }
12
```

<terminated> DoWhileLoop [Java Application] D:\eclipse\plu

1
2
3
4
5

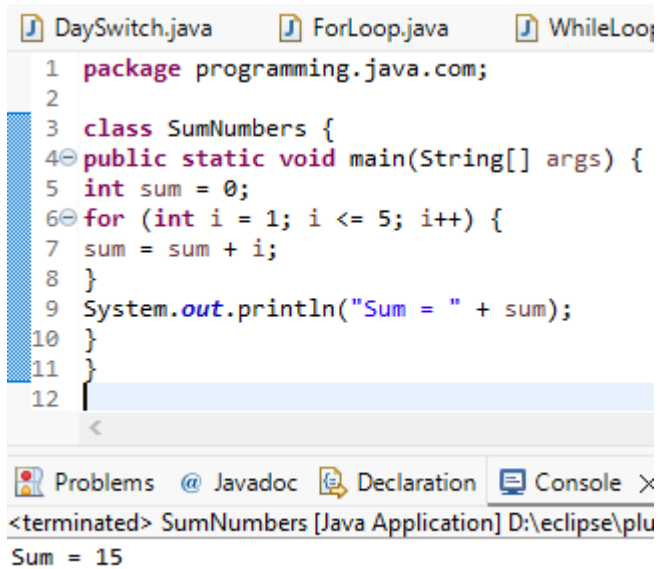
Program 9: Sum of First 5 Natural Numbers

```
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



```
1 package programming.java.com;
2
3 class SumNumbers {
4     public static void main(String[] args) {
5         int sum = 0;
6         for (int i = 1; i <= 5; i++) {
7             sum = sum + i;
8         }
9         System.out.println("Sum = " + sum);
10    }
11 }
12
```

<terminated> SumNumbers [Java Application] D:\eclipse\plu
Sum = 15

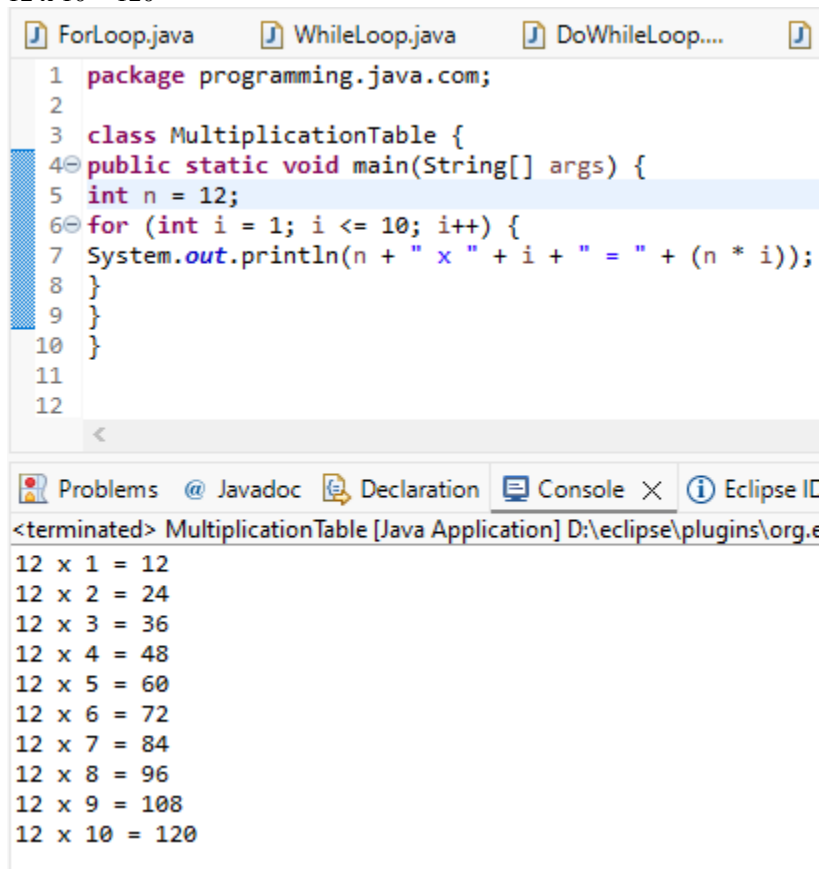
Program 10: Multiplication Table of a Number

```
class MultiplicationTable {
    public static void main(String[] args) {
        int n = 12;
        for (int i = 1; i <= 10; i++) {
            System.out.println(n + " x " + i + " = " + (n * i));
        }
    }
}
```

Output:

```
12 x 1 = 12
12 x 2 = 24
12 x 3 = 36
12 x 4 = 48
12 x 5 = 60
12 x 6 = 72
12 x 7 = 84
12 x 8 = 96
12 x 9 = 108
```

12 x 10 = 120



```
1 package programming.java.com;
2
3 class MultiplicationTable {
4 public static void main(String[] args) {
5 int n = 12;
6 for (int i = 1; i <= 10; i++) {
7 System.out.println(n + " x " + i + " = " + (n * i));
8 }
9 }
10 }
11
12
```

<terminated> MultiplicationTable [Java Application] D:\eclipse\plugins\org.e

```
12 x 1 = 12
12 x 2 = 24
12 x 3 = 36
12 x 4 = 48
12 x 5 = 60
12 x 6 = 72
12 x 7 = 84
12 x 8 = 96
12 x 9 = 108
12 x 10 = 120
```

POST LAB EXERCISE

- ✓ What is the use of if statement?

The if statement is used to check a condition in a program and control the flow of execution. When the condition is true, the corresponding block of code is executed; otherwise, it is skipped. It helps in decision making and allows programs to behave differently under different conditions.

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

The if-else statement is used when there are only two possible conditions to choose from. The else-if ladder is used to check multiple conditions sequentially. The conditions are evaluated from top to bottom, and the first true condition is executed.

- ✓ Why is switch statement used?
The switch statement is used to select one block of code from multiple choices based on the value of a variable. It makes the program more readable and organized when handling many conditions. It is commonly used in menu-driven applications.
- ✓ Difference between for, while, and do-while loops.
The for loop is used when the number of iterations is known in advance, while the while loop is used when the number of iterations is not known. The do-while loop executes the loop body at least once because the condition is checked after execution. This makes it different from for and while loops.
- ✓ Which loop executes at least once?
The do-while loop executes at least once in a program. This is because the loop body is executed before the condition is evaluated. Even if the condition is false, the loop runs one time.

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		