



**Vidyavardhini's College of Engineering and Technology**

**Department of Artificial Intelligence & Data Science**

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Experiment No.1
Basic programming constructs like branching and looping
Date of Performance:
Date of Submission:



# Vidyavardhini's College of Engineering and Technology

## Department of Artificial Intelligence & Data Science

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**Aim :-** To apply programming constructs of decision making and looping.

**Objective :-** To apply basic programming constructs like Branching and Looping for solving arithmetic problems like calculating factorial of a no entered by user at command prompt .

### Theory :-

Programming constructs are basic building blocks that can be used to control computer programs. Most programs are built out of a fairly standard set of programming constructs. For example, to write a useful program, we need to be able to store values in variables, test these values against a condition, or loop through a set of instructions a certain number of times. Some of the basic program constructs include decision making and looping.

Decision Making in programming is similar to decision making in real life. In programming also we face some situations where we want a certain block of code to be executed when some condition is fulfilled. A programming language uses control statements to control the flow of execution of program based on certain conditions. These are used to cause the flow of execution to advance and branch based on changes to the state of a program.

- if
- if-else
- nested-if
- if-else-if
- switch-case
- break, continue

These statements allow you to control the flow of your program's execution based upon conditions known only during run time.

A loop is a programming structure that repeats a sequence of instructions until a specific condition is met. Programmers use loops to cycle through values, add sums of numbers, repeat functions, and many other things. ... Two of the most common types of loops are the while loop and the for loop. The different ways of looping in programming languages are

- while
- do-while



- for loop
- Some languages have modified for loops for more convenience eg :- Modified for loop in java.  
For and while loop is entry-controlled loops. Do-while is an exit-controlled loop.

**Code: -**

### 1)While loop

```
class WhileLoopProgram
{
    public static void main(String args[])
    {
        int n=8;
        System.out.println("Check Even Number or Not!!");
        while(n%2==0)
        {
            System.out.println("Even Number!!");
            break;
        }
    }
}
```



```
Microsoft Windows [Version 10.0.22000.1936]
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C:\Users\parik>cd C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>javac WhileLoopProgram.java

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>java WhileLoopProgram.java
Check Even Number or Not!!
Even Number!!

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>_
```

## 2) For loop

```
class ForProgram
{
    public static void main(String args[])
    {
        int a=20,i;
        for(i=0;i<=a;i++)
        {
            System.out.println("whole number=",i);
        }
    }
}
```



```
ES Command Prompt
C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>javac ForProgram.java

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>java ForProgram.java
whole number=0
whole number=1
whole number=2
whole number=3
whole number=4
whole number=5
whole number=6
whole number=7
whole number=8
whole number=9
whole number=10
whole number=11
whole number=12
whole number=13
whole number=14
whole number=15
whole number=16
whole number=17
whole number=18
whole number=19
whole number=20

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>javac ForProgram.java
```

### 3) Do-While loop

```
class DoWhileProgram
{
    public static void main(String args[])
    {
        int a=20,i=0;
        System.out.println("Whole Number!!");
        do
        {
            System.out.println(i);
            i++;
        }
        while(i<=a);
    }
}
```

### 4) If Else

```
public class ifelse
```



```
{
public static void main(String[] args) {
    int number=13;
    if(number%2==0)
    {
        System.out.println("even number");
    }
    else
    {
        System.out.println("odd number");
    }
}
}
```

```
Microsoft Windows [Version 10.0.22000.1936]
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C:\Users\parik>cd C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02
C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>javac ifelse.java
C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>java ifelse.java
odd number
C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>
```

### 5) If Else Ladder

```
class IfElseLadder
{
    public static void main(String args[])
    {
        int month=8;

        if(month==6)
        {
            System.out.println("Entered month is June.");
        }
    }
}
```



```
        else if(month==7)
        {
            System.out.println("Entered month is July.");
        }
        else if(month==8)
        {
            System.out.println("Entered month is August.");
        }
        else if(month==9)
        {
            System.out.println("Entered month is September.");
        }
    }
}
```

```
ES: Command Prompt
Microsoft Windows [Version 10.0.22000.1936]
(c) Microsoft Corporation. All rights reserved.

C:\Users\parik>cd C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>javac IfElseLadder.java

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>java IfElseLadder.java
Entered month is August.

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>_
```

### 6)Nested If else

```
public class PositiveNegativeExample
{
```

```
    public static void main(String[] args) {
        int number=-13;
        if(number>0)
        {
```



```
        System.out.println("POSITIVE");
    }
    else if(number<0)
    {
        System.out.println("NEGATIVE");
    }
    else
    {
        System.out.println("ZERO");
    }
}
}
```

```
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C:\Users\parik>cd C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>javac PositiveNegativeExample.java

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>java PositiveNegativeExample.java
NEGATIVE

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>
```

## 7)Switch case

```
class SwitchProgram
{
    public static void main(String args[])
    {

        int a=2;
        switch(a)
        {
            case 1:
            {
                System.out.println("Monday!!!!");
            }
        }
    }
}
```





```
    }
    case 2:
    {
        System.out.println("Tuesday!!!!");
        break;
    }
    case 3:
    {
        System.out.println("Wednesday!!!!");
        break;
    }
    case 4:
    {
        System.out.println("Thursday!!!!");
        break;
    }
    default:
    {
        System.out.println("Invalid Day. Enter a Valid Day!!!!");
        break;
    }
}
}
}
```



```
Microsoft Windows [Version 10.0.22000.1936]
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C:\Users\parik>cd C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>javac SwitchProgram.java

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>java SwitchProgram.java
Tuesday!!!!

C:\Users\parik\OneDrive\Desktop\Priyanka Bhandari 02>
```

### Conclusion:

1) Comment on how branching and looping useful in solving problems.

Branching and looping are fundamental control structures in Java (and many other programming languages) that are essential for solving a wide range of problems. They provide the means to make decisions and repeat actions, making your code more dynamic and adaptable.

Branching (if statements):

Decision Making: If statements allow you to make decisions in your code based on conditions. You can execute different blocks of code depending on whether a condition is true or false.

Looping:

Repetition: Loops (for, while, and do-while) enable you to repeat a block of code multiple times, which is useful for tasks like processing arrays, lists, and performing iterative calculations.



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