



Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

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



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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



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- 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. class forpro{  
    public static void main(String args[]){  
        int i;  
        for(i=1;i<=10;i++) {  
            System.out.println("Glory Man United");  
        }  
    }  
}
```

Output:



```
C:\Windows\system32\cmd.e:  ×  +  v

Microsoft Windows [Version 10.0.22621.2428]
(c) Microsoft Corporation. All rights reserved.

C:\Users\ayush>cd C:\Users\ayush\Desktop\java

C:\Users\ayush\Desktop\java>javac forpro.java

C:\Users\ayush\Desktop\java>java forpro.java
Glory Man United
Glory Man United
Glory Man United
Glory Man United
Glory Man United
Glory Man United
Glory Man United
Glory Man United
Glory Man United
Glory Man United
Glory Man United

C:\Users\ayush\Desktop\java>|
```

```
2. class fourthpro{
    public static void main(String args[]){
        int a=1,b=2,c=3;
        if(a>b){
            System.out.println("a is greatest");
        }else if(b>c){
            System.out.println("b is greatest");
        }else{
```



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```
System.out.println("c is the greatest");  
}  
}  
}
```

Output:

A screenshot of a Windows command prompt window. The title bar shows the path "C:\Windows\system32\cmd.e" and standard window controls. The command prompt shows the following sequence of commands and output:
C:\Users\ayush\Desktop\java>javac fourthpro.java
C:\Users\ayush\Desktop\java>java fourthpro.java
c is the greatest
C:\Users\ayush\Desktop\java>|

```
3. class dowhilepro{  
    public static void main(String args[]){  
        int i=1;  
        do{  
            System.out.println("java");  
            i++;  
        }while(i<=10);  
    }  
}
```

OUTPUT:



```
C:\Windows\system32\cmd.e: X + v

C:\Users\ayush\Desktop\java>javac dowhilepro.java

C:\Users\ayush\Desktop\java>java dowhilepro.java
java
java
java
java
java
java
java
java
java
java

C:\Users\ayush\Desktop\java>|
```

```
4. class nested{
public static void main(String args[]){
    int a=21;
    if(a%2==0){
        if(a%3==0){
            System.out.println("number is divisible by both 2 and 3");
        } else{
            System.out.println("number is divisible only by 2 ");
        }
    } else{
        if(a%3!=0){
            System.out.print("number is not divisible by both");
        } else{
            System.out.print("number is only divisible by 3");
        }
    }
}
```



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```
}  
}  
}  
}
```

OUTPUT:

A screenshot of a Windows command prompt window. The title bar shows 'C:\Windows\system32\cmd.e' with a close button and a dropdown menu. The command prompt shows the following commands and output:

```
C:\Users\ayush\Desktop\java>javac nested.java  
  
C:\Users\ayush\Desktop\java>java nested.java  
number is only divisible by 3  
C:\Users\ayush\Desktop\java>|
```

```
5. class swipro{  
public static void main(String args[]){  
    int ch=2;  
    switch(ch){  
case 1:  
    {  
System.out.println("VISCA BARCA");  
    break;}  
case 2:  
    {  
System.out.println("HALA MADRIIIIIIDDD");  
    break;}  
case 3:  
    {
```



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```
System.out.println("GLORY GLORY MAN UNITED");
```

```
break;}
```

```
}
```

```
}
```

```
}
```

Output:

A screenshot of a Windows command prompt window. The title bar shows the path "C:\Windows\system32\cmd.e" with a close button. The command prompt shows the following sequence of commands and output:
C:\Users\ayush\Desktop\java>javac swipro.java
C:\Users\ayush\Desktop\java>java swipro.java
HALA MADRIIIIIIDDD
C:\Users\ayush\Desktop\java>|

```
C:\Users\ayush\Desktop\java>javac swipro.java  
C:\Users\ayush\Desktop\java>java swipro.java  
HALA MADRIIIIIIDDD  
C:\Users\ayush\Desktop\java>|
```

```
6. class whilepro{
```

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

```
        int i=1;
```

```
        while(i<=5) {
```

```
            System.out.println(i);
```

```
            i++;
```

```
        }
```

```
    }
```

```
}
```

OUTPUT:



```
C:\Windows\system32\cmd.e: X + v

C:\Users\ayush\Desktop\java>javac whilepro.java

C:\Users\ayush\Desktop\java>java whilepro.java
1
2
3
4
5

C:\Users\ayush\Desktop\java>|
```

Conclusion:

Comment on how branching and looping useful in solving problems.

Branching and looping are fundamental programming constructs that are immensely useful in problem-solving. Here's a brief comment on their utility:

1. Branching (Conditional Statements):

- Branching, like if-else statements, allows for decision-making in code. It enables the execution of specific code blocks based on certain conditions.
- It's crucial for handling alternative scenarios and making choices within a program.
- Branching is used to implement logic, perform validation, and handle exceptions, making code adaptable and responsive to varying inputs.



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2. Looping (Repetition Structures):

- Loops, such as for, while, and do-while, are used for repetitive tasks and automation.
- They simplify the execution of a block of code multiple times, which is vital for processing large data sets or performing repeated operations efficiently.
- Loops are essential in iterating through arrays, lists, and collections, streamlining algorithms, and optimizing computational tasks.

In summary, branching and looping are indispensable tools for problem-solving in programming. They enable logic-based decision-making and repetition, enhancing a program's capability to address a wide range of computational challenges.