Iterative/Looping statements

Iterative construct/ Loop

- A construct in which a block of statements gets executed repeatedly unless the required task has been completed, is known as an Iterative construct or a Loop.
- Iteration means repeated execution of a set of statement. This can be achieved by using a loop.
- Loop statement helps the programmer to execute the set of instructions repeatedly

In java we have different types of loop statements, they are:

1) while loop
2) do-while loop
3) for loop
4) for each / advanced for / enhanced for
5). nested loop

while Loop

- In while loop, a set of instructions are to be executed repeatedly without knowing the number of iteration.
- This loop can be applied to a program where number of iteration are not fixed.
- while is a conditional controlled loop.
- The loop will continue executing till the condition is true.
- The control terminates when the test condition is false.

Syntax to create while loop:

```
while(condition)
{
    Statement to be repeated ;
}
```

WORKFLOW:

CASE 1: When the condition is true

- The loop continues.
- Control execute the statement which belongs to the loop.
- After execution once the loop block ends, control goes back to the

condition and the entire process will be repeated till the condition becomes false.

CASE 2: When the condition is false

- The loop is stopped i.e. repetition is stopped.
- The loop block will not get executed.
- The control comes outside the loop to the next statement

do while

- do while loop is used in a program where number of iteration is not fixed.
- In this looping construct condition is checked at the exit point of the loop.

Syntax to create do-while loop :

```
do

{

  //statement

}

while(condition) ;
```

WORKFLOW :

CASE 1 : When the condition is true

- Control goes to the loop block directly , execute the instructions.
- Then control goes to the condition, if the condition is true the control goes back to the do block.

CASE 2: When the condition is false

- Control goes to the loop block directly, execute the instructions.
- Then control goes to the condition, if the condition is false the loop is stops and control goes to the next statement.

for loop

- In for looping construct, the statements are repeated for a fixed number of times.
- The control terminates after repeating the statement for given number of times.
- All the three segments are optional (Initialization, condition, update).
- If the condition is not provided, by default it is considered as true.

```
for(initialization ; condition ; update)
    {
      // statement to be repeated
    }
```

WORKFLOW:

Step 1: Control go to the initialization part.

Step 2: Then it will go to the condition part.

Step 3: If the condition is true then it will enter inside the loop block.

Step 4: Once the execution of instruction inside the loop block is completed control will go to the update segment.

Step 5: Then it will go back to the condition. Step1,2,3,4 will continue until the condition become false.

INFINITE LOOP

A loop which never ends is referred as Infinite or endless loop.

Eg 1;

```
int a=10;

  for( ; ; )

{

System.out.println(a);

}
```

Eg 2;

```
int a;

for(a=1; a<10;  )
{

   System.out.println(a);
}
```

Null loop

A for statement which does not include any statement as body of the loop is called Null loop or empty loop.

E.g. 1

```
for (int a=1;a<=10;a++);
```

E.g. 2

```
for(int a=1;a<=10;a++)
{
}
```