**Loops**

---

**Q. what is loop?**

---

Loop means if we want to perform some task repeat again and again called as loop.
If we want to work with loop we have two types of loop.

**1. Entry Control Loop:** entry control loop means first check the condition and after that decide loop will be execute or not called as entry control loop.

**There are two types of loop in entry control**

---

1. While loop
2. for loop

**2. Exit Control Loop:** Exit control loop means first execute loop and after that check the condition called as exit control loop.

1. do while loop

**If we want to work with any loop we have three major important points.**

**1. Initialization:** initialization means decide from loop will be start called as initialization.

**2. Condition:** condition means to decide how many times loop will be executed or decide number of iteration

**3. Increment or decrement:** steps to increase the value and decrease the value or gap between every step called as increment or decrement

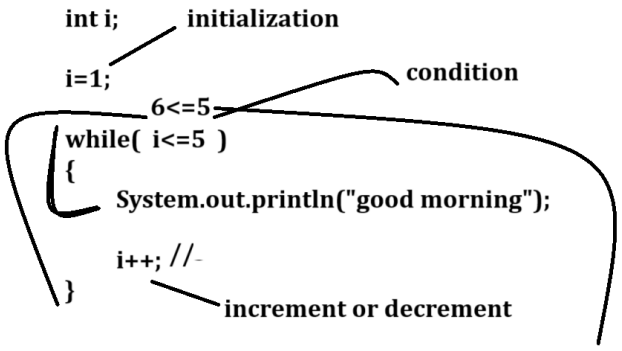
**Now we want to discuss about while loop**

---

**Syntax:**

```
Initialization;
while (condition )
{      Write here logics
        Increment or decrement;
}
```

Example: WAP to print good morning five times




'good morning'
good morning'
'good morning
good morning
'good morning'

```java
public class WhileLoopApp
{
   public static void main(String x[])
   {
       int i;
       i=1; //initialization

       while(i<=5)   //condition
       {

         System.out.println("good morning");

         i++;  //increment
       }
   }
}
```

**Output**

```
C:\Program Files\Java\jdk1.8.0_291\bin>javac WhileLoopApp.java

C:\Program Files\Java\jdk1.8.0_291\bin>java WhileLoopApp
good morning
good morning
good morning
good morning
good morning
```

**Example: WAP to print the 1 to 10 values while loop?**

```java
public class WhileLoopApp
{
   public static void main(String x[])
   {
       int i;
       i=1; //initialization

       while(i<=10)   //condition
       {

         System.out.println(" I  = "+i);

         i++;  //increment
       }
   }
}
```

```
C:\Program Files\Java\jdk1.8.0_291\bin>java WhileLoopApp
 I  = 1
 I  = 2
 I  = 3
 I  = 4
 I  = 5
 I  = 6
 I  = 7
 I  = 8
 I  = 9
 I  = 10

C:\Program Files\Java\jdk1.8.0_291\bin>
```

**Example: WAP to input number and print its table.**

---

**Steps**
1. input number
2. start loop from 1
3. execute loop 10 times
4. multiple number*i
5. gap between every iteration is 1

**Output:**
10
20
30
40
50
60
70
80
90
100

```java
import java.util.*;
public class LoopApp
{
    public static void main(String x[ ])
    {
        Scanner xyz  = new Scanner(System.in);
          int no , i , tab;
        System.out.println("Enter number");
        no=xyz.nextInt(); //10

        i=1;
        while( i<=10 )
        {
            tab = no  * i;

            System.out.printf( "%d\n" , tab);

            i++; //
        }

    }
}
```

| no | i | tab |
|---|---|---|
| 10 | 2 | 30 |

10
20

**Example: WAP to input number and calculate its factorial?**

---

```
2
import java.util.*;
public class FactApp
{
    public static void main(String x[ ])
    {    Scanner xyz  = new Scanner(System.in);
         int no , f = 1, i;
        System.out.println("Enter number");
        no=xyz.nextInt(); //5

        while( no!= 0) 0!=0
        {
            f = f * no; //120*1 = 120

            --no; //0
        }
        System.out.printf("Factorial is %d\n", f);
    }
}
```

| no | f | i |
|---|---|---|
| 4 | 120 | |

Output: Factorial is 120

**Example:** WAP to calculate sum of all natural number between 1 to 10?

---

```
import java.util.*;
public class SumApp
{
    public static void main(String x[])
    {
       int sum=0,i;
       i=1;
       while(i<=10)
       {
          sum  = sum  + i;

          i++;
       }
       System.out.printf("Sum of all value is %d\n",sum);
    }
}
```

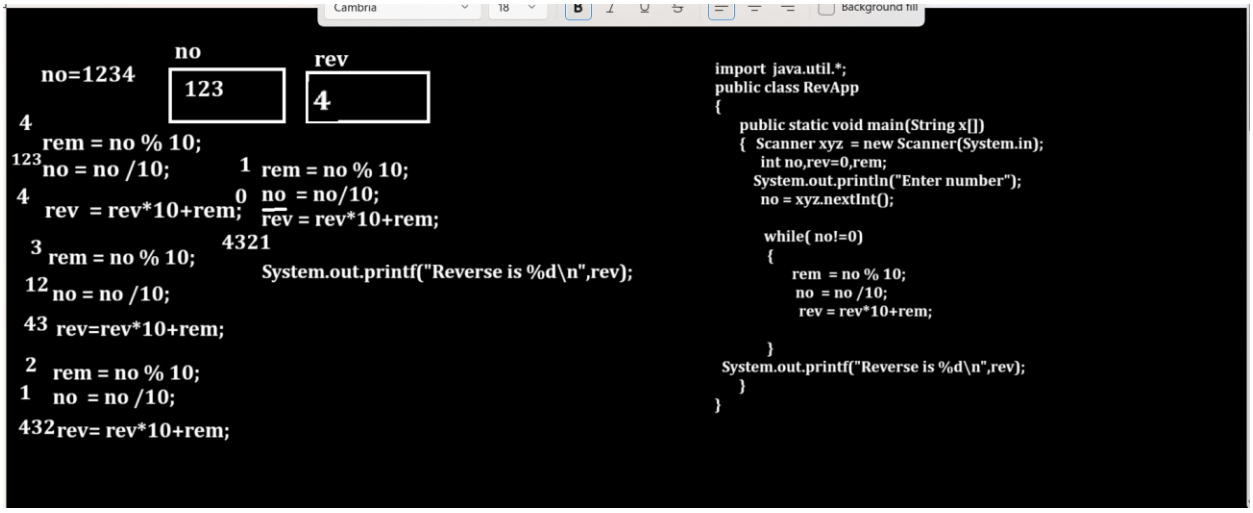
```
C:\Program Files\Java\jdk1.8.0_291\bin>javac SumApp.java

C:\Program Files\Java\jdk1.8.0_291\bin>java SumApp
Sum of all value is 55

C:\Program Files\Java\jdk1.8.0_291\bin>
```

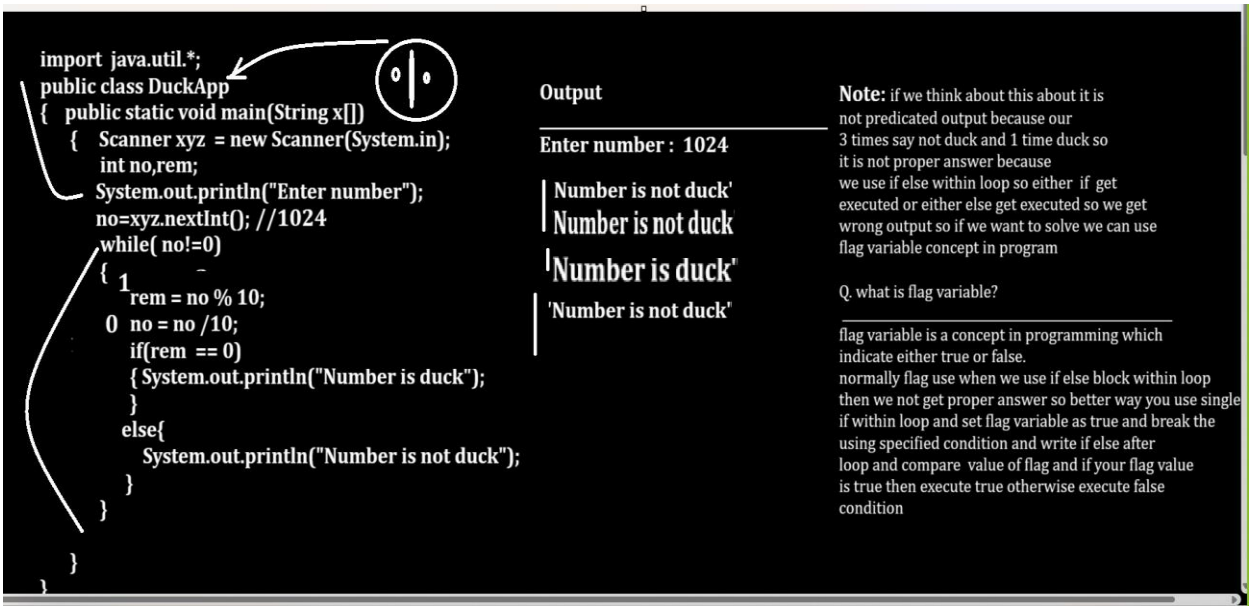
Example: WAP to input number and reverse it?
Input: 1234
Output: 4321

Input: 12345
Output: 54321




**Example:** WAP to input number and check number is duck or not
Duck number means number contain 0 called as duck
**Input: 1024** - it is duck number
**Input: 1234** – it is not duck number.

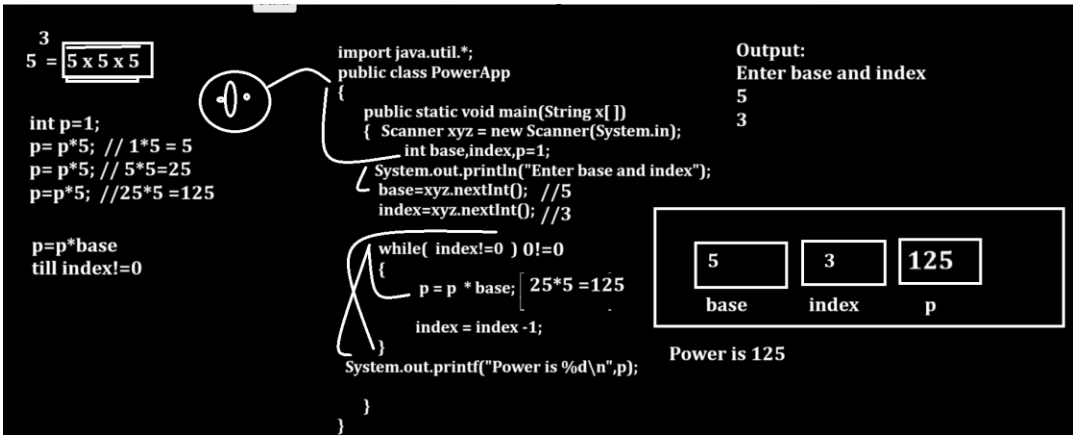
**Code without using flag variable concept**



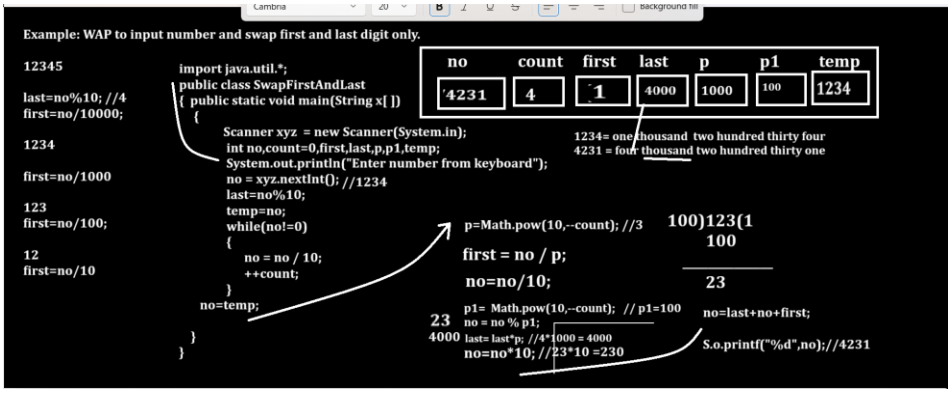
**Q. What will be output of given code?**

```
import java.util.*;
public class DuckApp
{
    public static void main(String x[])
    {  Scanner xyz  =new Scanner(System.in);
       System.out.println("Enter number");
       int no=xyz.nextInt(); //1024
  false boolean flag=false;
       while(no!=0)
       {
  0      int rem = no % 10;
  1      no  = no /10;
         if(rem ==0)
         {
              flag=true;
              break;
         }
       }
         if(flag) if(true)
         { System.out.println("Number is duck");
         }
         else
         { System.out.println("Number is not duck");
         }
    }
}
```

**Example:** WAP to input the two values consider first value as base and second value as index and calculate power of number?




Example: WAP to input number and swap its first and last digit?



**Example with source code**

```
import java.util.*;
public class SwapFirstAndLastDigit
{
   public static void main(String x[])
         {
            Scanner xyz  = new Scanner(System.in);
                  int no,temp,count=0,p,p1,first,last;
                  System.out.println("Enter number");
                  no=xyz.nextInt();
                  temp=no;
                  System.out.printf("\nBefore swapping first and last digit %d\n",no);
                  while(no!=0)
                  {  no  = no /10;
                     ++count;
                  }
                  no=temp;
                  last=no%10;
                  p=((int)Math.pow((double)10,(double)(--count)));
                  first=no/p;
                  no = no /10;
                  p1=((int)Math.pow((double)10,(double)(--count)));
                  no=no%p1;
                  last=last*p;
                  no = no *10;
                  no=last+no+first;
                  System.out.printf("\nAfter swapping first and last digit %d\n",no);
         }
}
```

**Example:** WAP to input number from keyboard and input search digit from keyboard and check digit present in number or not

**Output:**
**Input number:**
12345
**Input Digit for search**
3
**Output:** Digit found