

# while loop or while-else loop

## 1. while loop or while else loop

a) while loop (or) while .. else loop

Syntax:

```
while (Test Cond) :  
    Block of statements
```

Other Statements in Program

OR

```
while (Test Cond) :
```

```
    Block of statements
```

```
else:
```

```
    Else Block of statements
```

```
Other statements in Program
```

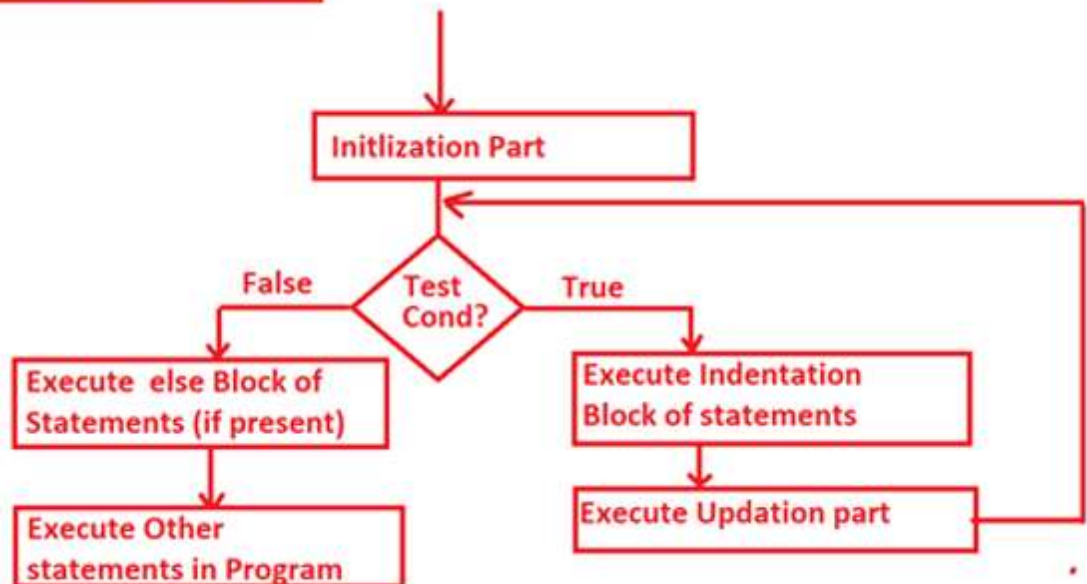
### Explanation:-

=>Test condition result may be True or False

=>In the while loop, if the test condition is true then PVM executes Indentation block of statements and once again PVM control goes to Test Cond. If the Test Cond is once again True then PVM executes Indentation block of statements once again. This Process will be continued until Test Cond becomes False.

=>Once The test cond becomes False then PVM execute else block of statements, which are written in else block and later also executes other statements in program.

### Flow Chart for while loop



## while loop Explanation

- The while loop in Python is use to iterate over a block of code as long as the test expression (condition) is true.
- We generally use this loop when we don't know beforehand, the number of times to iterate.
- In while loop, test condition is checked first. The body of the loop is entered only if the test expression evaluates to True. After one iteration the test expression is checked again. This process continues untill the test expression evaluates to false.
- In Python the body of the while loop is determined through indentation.
- Body starts with indentation and the first unindented line marks the end.
- Python interprets any Non-zero value as True. None and zero are interpreted as False.
- Writing else block is optional.
- while loop else part runs if no break occurs.

## **Difference between for loop Vs while loop :**

### **for loop :**

- for loop executes for each items in sequence and repeates block of code untill all iterates are completed.
- for loop executes for each items in sequence and repeates block of code untill if break statement is executed.

### **while loop :**

- while loop executes and repeates block of code untill test condition satisfied. It will stop once test condition failed.
- while loop executes and repeates block of code untill test condition satisfied. It will stop if break statement is executed.

## **Difference between if Vs while loop :**

### **if :**

- if condition check for one time only. If its true then executes other-wise not executes.

### **while loop :**

- while condition checks multiple times untill test condition satisfied. It will stop once test condition failed.

```
In [2]: x=0

while x<=6:
    print(x)
    x=x+1
```

```
0
1
2
3
4
5
6
```

```
In [4]: x=8

while x>=6:
    x=x-1
    print(x)
```

```
7
6
5
```

```
In [6]: i=0
s=0

while (i<=5):
    s=s+i
    i=i+2
    print(s)
    print(i)
```

```
0
2
2
4
6
6
```

```
In [7]: x=0

while x<5:
    x=x+1
print(x)
```

```
5
```

In [9]: *# Program to print 0 to 100 (inclusive) whole numbers by using while loop.*

```
i=0
while (i<=100):
    print(i,end=" ")
    i=i+1
```

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29  
 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 5  
 6 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82  
 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

In [1]: *#WAPP which will compute the sum of the n natural numbers by using while loop.*

```
# Ask the user to enter the n number.
n=int(input("Enter the n number:"))

i=1
sum=0
# use while loop to iterate until condition false.
while (i<=n):
    sum=sum+i
    i=i+1
print("The Sum of Natural Numbers from 1 to {} = {}".format(n, sum))
```

Enter the n number:5

The Sum of Natural Numbers from 1 to 5 = 15

In [3]: *#WAPP to find the product of all numbers present in the list by using while loop.*

```
# User given List
lst=[1,2,3,4,6]

p=1
i=0

while (i<len(lst)):
    p=p*lst[i]
    i=i+1
print("Product is:{}".format(p))
```

Product is:144

```
In [3]: '''WAPP to Find Sum of Numbers Entered by the User in Python once user want
        to stop the entering then enter #.'''

        # Ask the user to enter the numbers and once everything completed enter #.
        print(input("Enter the numbers and once everything completed enter # "))

        s=0

        while True:
            a=input("Enter a value:")
            if (a=="#"):
                break
            s=s+int(a)
        print("Sum of Numbers Entered by the User:",s)
```

```
Enter the numbers and once everything completed enter # 5
5
Enter a value:6
Enter a value:7
Enter a value:1
Enter a value:#
Sum of Numbers Entered by the User: 14
```

```
In [4]: numbers = [1,2,3,4,5]

        index=0

        while (index<=len(numbers)):
            print(index)
            index=index+1
            if index==3:
                break

        else:
            print("No item left in the list")
```

```
0
1
2
```

```
In [5]: '''Write a python program which will generate Even numbers within
         n where n must be positive integer value.'''

         # Ask the user to enter the number.
         n=int(input("Enter the number:"))

         # If number is less than or equal to "0", then print "n is invalid number"
         if (n<=0):
             print("{} is invalid number".format(n))

         # If number is greater than "0".
         else:
             # Initlization Part.
             i=2

             # use while loop to iterate until condition false.
             while (i<=n):
                 print("\t{}".format(i))
                 # Updation part.
                 i=i+2
```

Enter the number:10

2  
4  
6  
8  
10

```
In [7]: '''Write a python program which will a positive numeric integer
        value & generate its multiplication table.'''

        # Ask the user to enter the number.
        n=int(input("Enter the number:"))

        # If number is less than or equal to "0", then print "n is invalid number"
        if (n<=0):
            print("{} is invalid number".format(n))

        # If number is greater than "0".
        else:
            # Initlization Part.
            i=1
            # use while loop to iterate until condition false.
            while (i<=10):
                # print the multiplication table for n number
                print("{} X {}={}".format(n,i,n*i))
                # Updation part.
                i=i+1
```

Enter the number:8

```
8 X 1=8
8 X 2=16
8 X 3=24
8 X 4=32
8 X 5=40
8 X 6=48
8 X 7=56
8 X 8=64
8 X 9=72
8 X 10=80
```

```
In [9]: '''Write a python program which will generate Odd numbers within n
        where n must be positive integer value.'''

        # Ask the user to enter the number.
        n=int(input("Enter the number:"))

        # If number is less than or equal to "0", then print "n is invalid number"
        if (n<=0):
            print("{} is invalid number".format(n))

        # If number is greater than "0".
        else:
            # Initlization Part.
            i=1
            # use while loop to iterate until condition false.
            while (i<=n):
                # print the odd numbers.
                print("{}".format(i))
                # Updation part.
                i=i+2
```

Enter the number:10

1  
3  
5  
7  
9