Loop: Something that repeats continuously.

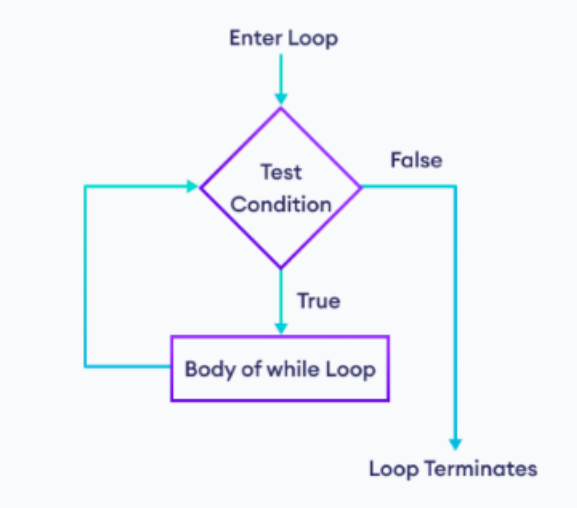
While Loop

Python while loop is used to run a block code until a certain condition is met.

The syntax of while loop is:

```
initialization
while condition:
   #body of while
   --------------
   --------------
   increment/decrement
```

1. A while loop evaluates the condition
2. If the condition evaluates to True, the code inside the while loop is executed.
3. condition is evaluated again.
4. This process continues until the condition is False.
5. When condition evaluates to False, the loop stops.



In [ ]:

In [ ]:

Variable	Condition: `i <= n`	Action
`i = 1` `n = 5`	`True`	`1` is printed. `i` is increased to **2**.
`i = 2` `n = 5`	`True`	`2` is printed. `i` is increased to **3**.
`i = 3` `n = 5`	`True`	`3` is printed. `i` is increased to **4**.
`i = 4` `n = 5`	`True`	`4` is printed. `i` is increased to **5**.
`i = 5` `n = 5`	`True`	`5` is printed. `i` is increased to **6**.
`i = 6` `n = 5`	`False`	The loop is terminated.

In [3]:
```
i=1
while i<=5:
    print(i)
    i+=1        #i=i+1
```

```
1
2
3
4
5
```

In [6]:
```
i=5
while i<=15:
    print(i,end=', ')
    i+=1
```

```
5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
```

In [8]:
```
n = int(input('Enter a number: '))
i = 1
while i<=n:
    print(i,end=', ')
    i+=1
```

```
Enter a number: 60
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, 4
1, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60,
```

In [9]:
```
i=5
while i>=1:
    print(i,end=', ')
    i-=1
```

```
5, 4, 3, 2, 1,
```

In [1]:
```
n = int(input('Enter a number: '))
i = 1
while n>=i:
    print(n,end=', ')
    n-=1
```

```
Enter a number: 7
7, 6, 5, 4, 3, 2, 1,
```

Q. Wapp to print all numbers present between 1 to 50 in reverse order.

In [2]:
```
i = 50
while i>=1:
    print(i,end=', ')
    i-=1
```

```
50, 49, 48, 47, 46, 45, 44, 43, 42, 41, 40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 1
2, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1,
```

In [ ]:
```

```

Q. Wapp to print all the even numbers present between 1 to 100 in reverse order.

In [3]:
```
i = 100
while i>=1:
    if i%2==0:
        print(i,end=', ')
    i-=1
```

```
100, 98, 96, 94, 92, 90, 88, 86, 84, 82, 80, 78, 76, 74, 72, 70, 68, 66, 64, 62, 60, 58, 56, 54, 52, 50, 48, 46, 44, 42, 40, 38, 36, 34, 32, 30, 28, 26,
24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2,
```

Q. Wapp to print all the odd numbers present between 200 to 500.

In [6]:
```
i=200
while i<=500:
    if i%2!=0:
        print(i,end=', ')
    i+=1
```

```
201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 26
1, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321,
323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 38
3, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443,
445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499,
```

In [7]:
```
n = int(input('Enter a number: '))
rev = 0
while n!=0:
    rem = n%10
    rev = rev*10+rem
    n=n//10
print(rev)
```

```
Enter a number: 435
534
```

Infinite while Loop in Python

If the condition of a loop is always True, the loop runs for infinite times (until the memory is full). For example,

In [ ]:
```
age = 18
while age>=18:
    print('you can vote')
    break
```

The 👆 condition always evaluates to True. Hence, the loop body will run for infinite times.

Q. Wapp to print table of enter number using while loop.

In [ ]:

In [ ]:

Q. Wapp to reverse the digits of any entered number.

```
input - 897
output - 798
```

In [ ]:

Q. Wapp to find sum of the digits of any entered number.

```
input - 897
output - 8+9+7 = 24
```

In [ ]:

Q. Find the sum of even numbers from 1 to entered number using while loop.

In [ ]:

Q. Take input of start and end range from user and print the average value of the given range.

Q. Wapp to find the factorial of an entered number using while loop.

For Loop :

A for loop is used for iterating over a sequence (that is either a list, a tuple, a dictionary, a set, or a string).
With the for loop we can execute a set of statements, once for each item in a list, tuple, set etc.

The syntax of for loop is:

```
for i in collection:
    #body of for
```

In [1]:
```
#string
for i in 'python':
    print(i)
```

```
p
y
t
h
o
n
```

In [2]:
```
a = 'python'
for i in a:
    print(i)
```

```
p
y
t
h
o
n
```

In [3]:
```
#list
for j in [89,6,23,16,90]:
    print(j)
```

```
89
6
23
16
90
```

In [4]:
```
#tuple
for t in (34,56,78,2,3,3):
    print(t)
```

```
34
56
78
2
3
3
```

In [5]:
```
#set
for s in {4,6,8,2,6,8,9,5}:
    print(s)
```

```
2
4
5
6
8
9
```

In [7]:
```
#dictionary
d = {1:'A',2:'B',3:'C',4:'D'}
for J in d.values():
    print(J)
```

```
A
B
C
D
```

In [ ]:

range() : It is a built-in function generates a sequence of integers between any given interval.

```
range(start,stop+1,step)
```

In [8]:
```
for i in range(1,6,1):
    print(i)
```

```
1
2
3
4
5
```

In [9]:
```
for i in range(6):
    print(i)
```

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

In [10]:
```
for i in range(5,0,-1):
    print(i)
```

```
5
4
3
2
1
```

In [ ]:

In [ ]:

Q. Wapp to find all the numbers that are divisible by 5 lies between the range 100 - 200.

In [11]:
```
for i in range(100,201,1):
    if i%5==0:
        print(i,end=', ')
```

```
100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200,
```

In [ ]:

Q. Wapp to count the number of even and odd numbers from a series of numbers.

```
series = [11,13,87,41,51,5,16,44,90,3,23,56,78,33,98,76,99]
```

In [13]:
```
series = [11,13,87,41,51,5,16,44,90,3,23,56,78,33,98,76,99]
e = 0
o = 0
for i in series:
    if i%2==0:
        e+=1
    else:
        o+=1
print('Total even number :',e)
print('Total odd number :',o)
```

```
Total even number : 7
Total odd number : 10
```

Q. Wapp to print multiplication table of entered number using for loop.

In [ ]:

Q. Wapp to count the total number of digits in a number.

In [ ]:

In [ ]:

In [ ]:

Q. Wapp to find product of the digits of any entered number.

```
input - 897
output - 8*9*7 = 504
```

Q. Wapp to enter any string and print the vowels present in the string.

Q. Wapp to print the factors of an entered number.

Q. Wapp that accepts a word from the user and reverses it.

Q. Wapp to count the factors of an entered number.

Q. Wapp to find the factorial of an entered number using for loop.

Q. Wapp to check if the entered string is pallindrome or not.

```
input - 'mom'
output - 'mom' when reversed
```

Q. Wapp to check if the entered number is pallindrome or not.

```
input - '12321'
output - '12321' when reversed
```

Q. Find the sum of even numbers using for loop.

Q. Wapp to convert the month name to number of days.

Q. Find the sum of odd numbers using all possible looping structure.

Q. Wapp to count the no. of digits and alphabets present inside the entered string.

Q. Write a Python program that takes an integer n as input and returns the sum of the squares of all integers from 1 to n.

Q. Write a Python program to find duplicates from a list and returns a list of elements that appear more than once in list.