

Loops

1) For Loop

A for loop is used when you know the exact number of times you want to repeat a block of code. It goes through a sequence (like numbers, lists, strings, etc.)

Syntax:

- ⇒ For loop with sequence:-
for var in sequence_name:
 statements
- ⇒ For loop with range:-
for var in range(start value, stop value, step):
 statement

eg:- for i in range(1,6):
 print(i, end=" ")

Output

1 2 3 4 5

2) While Loop

A while loop is used when you don't know how many times you need to repeat. It runs as long as the condition is true.

Syntax

Initialization
while (condition):
 statements
 Inc/Dec

eg:-

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

3) Nested loop

A nested loop means a loop inside another loop used when you need rows & columns (like patterns, table, matrices)

a) for loop inside for loop

Syntax:

```
for var-a in range():  
    for var-b in range():  
        statements of inner loop  
    statement of outer loop
```

eg: for i in range(1,4):

for j in range(1,4):

print(i,j)

Output

1	1
1	2
1	3
2	1
2	2
2	3
3	1
3	2
3	3

b) while loop inside while loop

Initialization of outer loop

while (condition of outer loop):

Initialization of inner loop

while (condition of inner loop):

statements of inner loop

inc/dec of inner loop

statements of outer loop

inc/dec of outer loop