Nested While Loop:-

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⇒ A nested While Loop means having one While Loop inside another While Loop.

⇒ The outer loop controls how many times the inner loops runs.

⇒ The inner loop runs completely for each iteration of the outer loop

Syntax:-

```
Initialization of outer loop
While condition: #(outer loop)
    Initialization of inner loop
    While condition 2 : #(inner While Loop)
        Statements of innerLoop.
        Inc/dec of inner loop.
    Statements of outer Loop.
```

Eg: Square of Star :- 3×3

```
i = 1
while i <= 3:
    j = 1
    while j <= 3:
        print("*", end = " ")
        j += 1
    print()
    i += 1
```

* outer loop (i) → row control (runs 3 times)
* inner Loop (j) = column control runs 3 time for every row)
* Total stars printed 3×3 = 9

O/P

```
* * *
* * *
* * *
```

Number Triangle:-

```
i = 1
while i <= 5 :
    j = 1
    while j <= i :
    print(j, end = " ")
        j += 1
    print()
    i += 1
```

O/p

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

Note :-

1. Outer loop runs first → start one row it has to
2. Inner loop runs fully - Completes its job for that row
3. After Inner loop ends, Outer loop updates and run again
4. Always update Variable

(i += 1, j += 1)

if otherwise - Infinite loop

Outer loop → How many lines

Inner loop → what to print in that line

Reverse pattern printing in while Loop

```
i = 5
while i >0:
    print("*", * i)
    i = i - 1
```

O/p

```
* * * * *
* * * *
* * *
* *
*
```

Above Question in Nested While Loop

```
row = 5
while (row <=5):
    col = 1
    while (col <= row):
        print("*", end = " ")
        col = col + 1
    print()
    row = row - 1
```

O/p

```
* * * * *
* * * *
* * *
* *
*
```