

Nested Looping Statements

Defining looping statement inside looping statement is called nested looping statements.

1. Nested for
2. Nested while

Nested for loop

Defining for loop inside for loop is called nested for.

Syntax:

```
for variable in <iterable>: # Outer For Loop
    statement-1;
    for variable in <iterable>: # Inner For Loop
        statement-1
        statement-2
    statement-2
```

Find Output

```
for x in "ABC": ————— Outer Loop
    for y in "XYZ":
        print(y,end=' ')
```

X Y Z X Y Z X Y Z

Find Output

```
for x in "ABC":
    for y in "XYZ":
        print(x,end=' ')
```

A A A B B B C C C

Example:

Write a program to generate tables from 1 to 10

```
for num in range(1,11): # 1 2 3 4 5 6 7 8 9 10
```

```
    for i in range(1,11): # 1 2 3 4 5 6 7 8 9 10
```

```
        print(f'{num}x{i}={num*i}')
```

```
    input()
```

Output:

1x1=1

1x2=2

1x3=3

1x4=4

1x5=5

1x6=6

1x7=7

1x8=8

1x9=9

1x10=10

2x1=2

2x2=4

2x3=6

2x4=8

2x5=10

2x6=12

2x7=14

2x8=16

2x9=18

2x10=20

3x1=3

3x2=6

3x3=9

3x4=12

3x5=15

3x6=18

3x7=21

3x8=24

3x9=27

$$3 \times 10 = 30$$

$$4 \times 1 = 4$$

$$4 \times 2 = 8$$

$$4 \times 3 = 12$$

$$4 \times 4 = 16$$

$$4 \times 5 = 20$$

$$4 \times 6 = 24$$

$$4 \times 7 = 28$$

$$4 \times 8 = 32$$

$$4 \times 9 = 36$$

$$4 \times 10 = 40$$

...

Example:

Write a program to generate prime numbers from 1 to 20

```
for num in range(1,21):# 1 2 3 4 5 6 7 8...20
```

```
    c=0
```

```
    for i in range(1,num+1): # 1 2 3 4
```

```
        if num%i==0:
```

```
            c=c+1
```

```
    if c==2:
```

```
        print(num)
```

Output:

2

3

5

7

11

13

17

19

Example:

Write a program to generate factorials of numbers

from 1-5

```

for num in range(1,6): # 1 2 3 4 5
    fact=1
    for i in range(1,num+1):
        fact=fact*i
    print(f'{num}-->{fact}')

```

Output:

```

1-->1
2-->2
3-->6
4-->24
5-->120

```

Patterns

```

for i in range(1,6): --> 1 2 3 4 5
    for j in range(1,6): --> 1 2 3 4 5
        print("1",end=' ')
    print()

```

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

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

```
for i in range(1,6):
    for j in range(1,6):
        print(i,end=' ')
    print()
```

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

```
for i in range(5,0,-1):
    for j in range(1,6):
        print(i,end=' ')
    print()
```

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

```
for i in range(1,6): # 1 2 3 4 5
    for j in range(1,i+1):
        print("1",end=' ')
    print()
```

```
1 1 1 1 1
1 1 1 1
1 1 1
1 1
1
```

```
for i in range(5,0,-1):
    for j in range(1,i+1):
        print("1",end=' ')
    print()
```