

Nested Looping Statements

A looping statement within looping statement is called nested looping statements.

These nested looping statements can be,

1. Nested for loop
2. Nested while loop

Nested for

for loop inside for loop is called nested for loop

nested for loop allows repeating for loop number of times.

Syntax:

```
for variable-name in iterable/collection:
    for variable-name in iterable/collection:
        statement-1
        statement-2
```

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}')
```

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
....

Example:

Write a program to generate prime numbers from 2 to 20

```
for num in range(2,21): # 2 3 4 5 6 7 8 9 10 ... 20 Outer Loop
    c=0
    for i in range(1,num+1): # Inner Looping Statement
        if num%i==0:
            c=c+1
    if c==2:
        print(f'Prime {num}')
```

Output

Prime 2
Prime 3
Prime 5
Prime 7
Prime 11
Prime 13

Prime 17

Prime 19

Printing Patterns

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

1 2 3 4 5

```
for i in range(1,6):  
    print(i)
```

1
2
3
4
5

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

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

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

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

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

	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,i+1):  
        print(i,end=' ')
```

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

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

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

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

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

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

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

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

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

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

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

```
1 * 3 * 5
1 * 3 * 5
1 * 3 * 5
1 * 3 * 5
1 * 3 * 5
```

```
for i in range(1,6):
    for j in range(1,6):
        if j%2==0:
            print("*",end=' ')
        else:
            print(j,end=' ')
    print()
```

```
1
* *
3 3 3
* * * *
5 5 5 5 5
```

```
for i in range(1,6):
    for j in range(1,i+1):
        if i%2==0:
            print("*",end=' ')
        else:
            print(i,end=' ')
    print()
```

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

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

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```

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

```
A
A B
A B C
A B C D
A B C D E
```

```
for i in range(65,70):
    for j in range(65,i+1):
        print(chr(j),end=' ')
    print()
```

	65	66	67	68	69
65	A	B	C	D	E
66	A	B	C	D	E
67	A	B	C	D	E
68	A	B	C	D	E
69	A	B	C	D	E

```
for i in range(65,70):
    for j in range(65,70):
        print(chr(j),end=' ')
    print()
```

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

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

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

```
for i in range(1,6):
    for j in range(1,6):
        if i+j==6:
            print("*",end=' ')
        else:
            print(" ",end=' ')
    print()
```

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

```
for i in range(1,6):
    for j in range(1,6):
        if i==1 or i==5:
            print("*",end=' ')
        print()
```

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

```
for i in range(1,6):
    for j in range(1,6):
        if j==1 or j==5:
            print("*",end=' ')
        else:
            print(" ",end=' ')
    print()
```