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3) while loop inside for loop

A while loop inside a for loop means that for every iteration of the for loop, the while loop executes as long as its condition remains true.

Syntax:

```
for var in range(): #outer loop
    initialization of while
    while(condition): #inner loop
        statements of while loop
        incrementation/decrementation of while loop
    statements of for loop
```

example:

```
for i in range(1,6,1):
    j=5
    while(j>i):
        print(' ',end=' ')
        j=j-1
    k=1
    while(k<=i):
        print(i,end=' ')
        k=k+1
    print()
```

o/p:

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

```
for i in range(1,6,1):
   j=5
   while(j>i):
      print(' ',end=' ')
      j=j-1
   k=1
   while(k<=i):
      print(i,end=' ')
      k=k+1
   print()
for i in range(4,0,-1):
   j=5
   while(j>i):
      print(' ',end=' ')
      j=j-1
   k=1
   while(k<=i):
      print(i,end=' ')
      k=k+1
   print()
```

o/p:

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

4) for loop inside while loop

A for loop inside a while loop means that for every iteration of the while loop, the for loop executes completely before the next iteration of the while loop begins.

Syntax:

```
initialization of while loop
while(condition): #outer loop
    for var in range(): # inner loop
        statements of for loop
    statements of while loop
    incrementation/decrementation of while loop
```

example:

```
i=1

num=2

while(i<=5):

    for j in range(1,i+1,1):

        print(num,end=' ')

        num=num+2

    print()

    i=i+1
```

o/p:

```
2

4 6

8 10 12

14 16 18 20

22 24 26 28 30
```