

# *LECTURE*

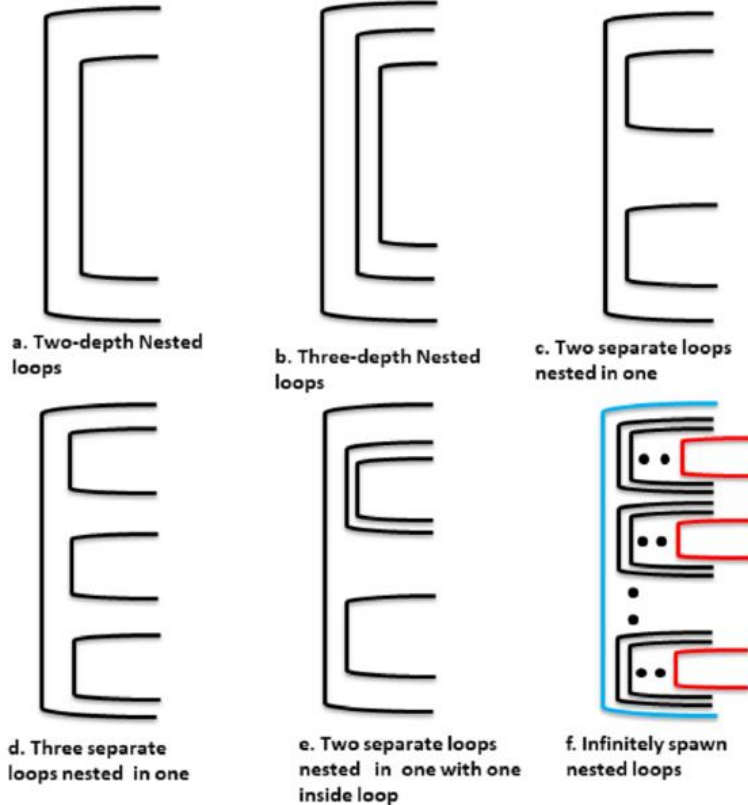
## *TWO*

### **Fundamentals of Programming**



## Nested Loop (Loops Inside Loops)

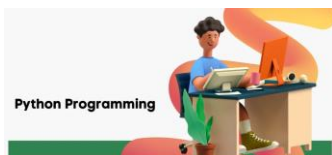
A nested loop is a loop inside a loop. The "**inner loop**" will be executed one time for each iteration of the "**outer loop**"



**Example (1):** Write Python Program to find following series:

$$\sum_{i=1}^5 \sum_{j=1}^8 i + j$$

while	for
<pre> i,s=1,0 while i&lt;=5:     j=1     while j&lt;=8:         s=s+ i+j         j=j+1     i=i+1 print("sum is",s)                     </pre>	<pre> s=0 for i in range(1,6):     for j in range(1,9):         s=s+ i+j         print("sum is",s)                     </pre>



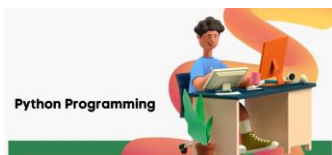
**Example (2):** Write Python Program to find following series:

$$\sum_{i=1}^n \sum_{j=1}^m \frac{i}{j}$$

While	for
<pre> n = int(input("enter n ")) m = int(input("enter m "))  i,s=1,1 while i&lt;=n:     j=1     while j&lt;=m:         s=s+ (i/j)         j=j+1     i=i+1 print("sum is",s) </pre>	<pre> n = int(input("enter n ")) m = int(input("enter m ")) s=1 for i in range(1,n+1):     for j in range(1,m+1):         s=s+ (i/j)     print("sum is",s) </pre>

**Example (3):** Write Python Program to print multiplication table

While	for
<pre> size = int(input("enter table size: ")) r=0 while r&lt;size:     c=0     while c&lt;size:         print(r,"*",c,"=",r*c)         c=c+1     r=r+1     print() </pre>	<pre> size = int(input("enter table size: ")) for r in range(size + 1):     for c in range( size + 1):         print(r,"*",c,"=",r*c)     print() </pre>



**Example (4):** Write Python Program to find following pattern:

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

```
for i in range(1,4):  
    for j in range(1,4):  
        print("*",end="")  
    print()
```

**Example (5):** Write Python Program to find following pattern:

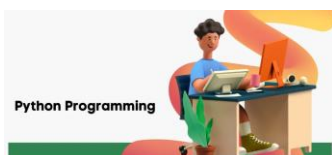
```
111  
222  
333
```

```
for i in range(1,4):  
    for j in range(1,4):  
        print(i,end="")  
    print()
```

**Example (6):** Write Python Program to find following pattern:

```
123  
123  
123
```

```
for i in range(1,4):  
    for j in range(1,4):  
        print(j,end="")  
    print()
```



**Example (7):** Write Python Program to find following pattern:

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

```
for i in range(1,4):  
    for j in range(1,i+1):  
        print("*",end="")  
    print()
```

**Example (8):** Write Python Program to find following pattern:

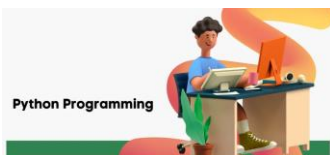
```
1  
22  
333
```

```
for i in range(1,4):  
    for j in range(1,i+1):  
        print(i,end="")  
    print()
```

**Example (9):** Write Python Program to find following pattern:

```
1  
1 2  
1 2 3
```

```
for i in range(1,4):  
    for j in range(1,i+1):  
        print(j,end="")  
    print()
```

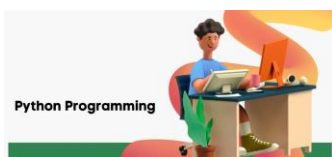


## Python break statement

The break statement **terminates** the loop containing it. Control of the program flows. If the break statement is inside a nested loop (loop inside another loop), the break statement will terminate the innermost loop.

Example: Python break statement inside loop	
while	for
<pre>i=1 while i&lt;5:     if i == 3:         break     print(i)     i=i+1</pre>	<pre>for i in range(1,5):     if i == 3:         break     print(i)</pre>

Example: Python break statement inside nested loop	
while	for
<pre>i=1 while i&lt;5:     if i == 3:         break     j=1     while j&lt;5:         print(i, end="")         j=j+1     print()     i=i+1</pre>	<pre>for i in range(1,5):     if i == 3:         break     for j in range(1,5):         print(i, end="")     print()</pre>
output	
1111	
2222	

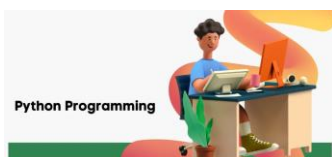


## Python continue statement

The continue statement is used to skip the rest of the code inside a loop for the current iteration only. Loop does not terminate but continues on with the next iteration.

Example: Python continue statement inside the loop	
while	for
<pre>i = 1 while i &lt; 5:     if i == 2:         continue     print(i)     i = i + 1</pre>	<pre>for i in range(1,5):     if i == 2:         continue     print(i)</pre>

Example: Python continue statement inside nested loop	
while	for
?	<pre>for i in range(1,5):     if i == 3:         continue     for j in range(1,5):         print(i, end="")     print()</pre>
output	
<pre>1111 2222 4444</pre>	



## WORK SHEET (6)

 Homework Write Python Program to find following pattern:

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

 Homework Write Python Program to find following pattern:

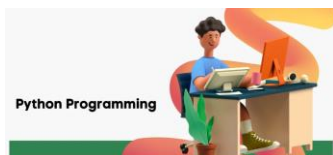
```
4 4 4 4
3 3 3
2 2
1
```

 Homework Write Python Program to find following pattern:

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

 Homework Write Python Program to find following pattern:

```
4444
3333
2222
1111
```





**Homework** Write Python Program to find following pattern:

```
1
2 3
4 5 6
7 8 9 10
```

**Homework** What will be the output of the following Python code:

```
i = 1
while i<=6:
    if i%3 == 0:
        break
    print(i)
    i=i+1
```

**Homework** What will be the output of the following Python code:

```
i = 1
while i<=6:
    if i%2 == 0:
        continue
    print(i)
    i=i+2
```

