

```
In [1]: if True:
    print('Data Science')
```

Data Science

```
In [2]: if True:
    print('ds')
```

ds

```
In [3]: if False:
    print('Data Science')
print('Bye for now')
```

Bye for now

```
In [4]: if True:
    print('Data Science')
print('Bye for now')
```

Data Science

Bye for now

```
In [5]: x = 4
r = x % 2

if r == 0:
    print('Even number')

# else:
#     print('Odd number')
```

Even number

```
In [6]: x = 5
r = x % 2

if r == 0:
    print('Even number')
print('Odd number')
```

Odd number

```
In [7]: x = 10
r = x % 2

if r == 0:
    print('Even number')

if r == 1:
    print('Odd number')
```

Even number

```
In [8]: x = 11
r = x % 2
```

```

if r == 0:
    print('Even number')

if r == 1:
    print('Odd number')

```

Odd number

```

In [9]: x = 23
r = x % 2

if r == 0:
    print('Even number')

if r == 1:
    print('Odd number')

```

Odd number

```

In [10]: x = 23
r = x % 2

if r == 0:
    print('Even number')

if r != 0:
    print('Odd number')

```

Odd number

```

In [11]: x = 5
r = x % 2
if r == 0:
    print('Even number')

else:
    print('Odd number')

```

Odd number

```

In [12]: x = 5
r = x % 2
if x == 0:
    print('Even number')

else:
    print('Odd number')

```

Odd number

## NESTED IF (if we have 2 condition so we need to implement with nested if )

```

In [14]: x = 3
r = x % 2
if(r == 0):

```

```

print('Even number')
if(x > 5):
    print('Greater number')

else:
    print('Odd number')

```

Odd number

```

In [15]: x = 4
r = x % 2
if r == 0:
    print('Even number')
    if x > 5:
        print('Greater number')

else:
    print('Odd number')

```

Even number

```

In [16]: x = 8
r = x % 2
if r == 0:
    print('Even number')
    if x > 5:
        print('Greater number')

else:
    print('Odd number')

```

Even number

Greater number

```

In [17]: x = 4
r = x % 2
if r == 0:
    print('Even number')
    if x > 5:
        print('Greater number')

else:
    print('Not Greater number')

else:
    print('Odd number')

```

Even number

Not Greater number

## We do have concept of ( IF - ELIF- ELSE)

e.g i want to print ( 1--> one , 2 --> two, 3--> three,  
4--> four, 5- five)

```
In [19]: x = 2

if x == 1:
    print('one')
if x == 2:
    print('Two')
if x == 3:
    print('Three')
if x == 4:
    print('four')
```

Two

```
In [20]: x = 4

if(x == 1):
    print('One')
elif(x == 2):
    print('Two')
elif(x == 3):
    print('Three')
elif(x == 4):
    print('Four')
```

Four

```
In [21]: x = 7

if(x == 1):
    print('One')
if(x == 1):
    print('One')

if(x == 1):
    print('One')

if(x == 1):
    print('One')

else:
    print('Wrong output')
```

Wrong output

```
In [22]: x = 10

if(x == 1):
    print('One')
if(x == 1):
    print('One')

if(x == 1):
    print('One')

if(x == 1):
    print('One')
```

```
else:
    print('Wrong output')
```

Wrong output

```
In [23]: a = 30
b = 20

if a>b: print('a is greater than b')
```

a is greater than b

**LOOPS -- in programming world some time we keep on repeating , may be you want to repeat 5 statement so one way is copy & paste multiple times or other way is**

**if you want to print the datascience 1000 times then what you will you cant copy for 1000 times , if you want to print 1000 times then you cant do manualy . that is the reason why we need to apply loop -> 2 type of loops -- While loop & For loop**

```
In [25]: print('data science')
print('data science')
print('data science')
print('data science')
print('data science')
```

data science  
data science  
data science  
data science  
data science

```
In [26]: i = 1

while i<= 5:
    print('data science')
    i = i + 1
```

data science  
data science  
data science  
data science  
data science

```
In [27]: i = 5

while i>=1:
    print('data science')
    i = i - 1
```

```
data science
data science
data science
data science
data science
data science
```

```
In [28]: i = 1
```

```
while i <= 5:
    print('data science: ', i)
    i = i + 1
```

```
data science: 1
data science: 2
data science: 3
data science: 4
data science: 5
```

```
In [29]: i = 5
```

```
while i >= 1:
    print('data science: ', i)
    i = i - 1
```

```
data science: 5
data science: 4
data science: 3
data science: 2
data science: 1
```

```
In [30]: i = 1
```

```
while i <= 5:
    print('Data Science')
    j = 1
    while j <= 5:
        print('Technology')
        j = j + 1

    i = i + 1
print()
```

```
Data Science
Technology
Technology
Technology
Technology
Technology
```

```
Data Science
Technology
Technology
Technology
Technology
Technology
```

```
Data Science
Technology
Technology
Technology
Technology
Technology
```

```
Data Science
Technology
Technology
Technology
Technology
Technology
```

```
Data Science
Technology
Technology
Technology
Technology
Technology
```

```
In [31]: i = 1
while i <= 5:
    print(' Data Science', end="")
    j = 1
    while j <= 4:
        print(' Technology', end = "")
        j = j+1
    i = i + 1
print()
```

```
Data Science Technology Technology Technology Technology
```

```
In [32]: i = 1

while i <= 2:
    j = 0
```

```

while j <= 2:
    print(i*j, end=" ")
    j += 1
print()
i += 1

```

0 1 2  
0 2 4

```

In [33]: i = 1

while i <= 4:
    j = 0
    while(j <= 3):
        print(i*j, end = " ")
        j += 1

    print()
    i += 1

```

0 1 2 3  
0 2 4 6  
0 3 6 9  
0 4 8 12

## FOR LOOP -

**normally while loop it work with iteration or certain some condition but for loop it will work with sequence (list, string,int)**

```

In [35]: name = 'nit'
for i in name:
    print(i)

```

n  
i  
t

```

In [36]: name1 = [1, 3.5, 'hello']

for i in name1:
    print(i)

```

1  
3.5  
hello

```

In [37]: name2 = [2, 3.5, 'Ariel']

for i in name2:
    print(i)

```

```
2  
3.5  
Ariel
```

```
In [38]: range(5)
```

```
Out[38]: range(0, 5)
```

```
In [39]: for i in range(5):  
    print(i)
```

```
0  
1  
2  
3  
4
```

```
In [40]: for i in range(2,5):  
    print(i)
```

```
2  
3  
4
```

```
In [41]: for i in range(1, 10, 3):  
    print(i)
```

```
1  
4  
7
```

```
In [42]: for i in range(1,51):  
    if i%5 == 0:  
        print(i)
```

```
5  
10  
15  
20  
25  
30  
35  
40  
45  
50
```

```
In [43]: for i in range(1,51):  
    if i % 5 != 0:  
        print(i)
```

```
1  
2  
3  
4  
5  
6  
7  
8  
9  
11  
12  
13  
14  
16  
17  
18  
19  
21  
22  
23  
24  
26  
27  
28  
29  
31  
32  
33  
34  
36  
37  
38  
39  
41  
42  
43  
44  
46  
47  
48  
49
```

## **LETS DISCUSS ABOUT 3 KEYWORDS -- BREAK || CONTINUE || PASS**

**BREAK STATEMNT - if you apply break statement in a loop then it will end the loop**

**Pass = skips block of code( function, class etc)**

**Continue= skips 1 step/iteration during loop**

## Break= jumps out of the function/loop

```
In [45]: x = int(input('How many Chocalates do you want?'))

i = 1
while i <= x:
    print('Chocalates')
    i += 1
```

Chocalates  
Chocalates  
Chocalates  
Chocalates  
Chocalates  
Chocalates

```
In [46]: ava_choc = 5

x = int(input('How much chocalate do you want?'))
i = 1
while i <= x:
    if i>ava_choc:
        break

    print('Chocalate')
    i += 1

print('Bye for now')
```

Chocalate  
Chocalate  
Chocalate  
Chocalate  
Bye for now

```
In [101...]: ava_choc = 5

x = int(input('How many chocalates do you want?'))

i = 1

while i<=x:
    if i >ava_choc:
        print('out of stock')
        break
    print('Chocalate')
    i = i + 1

print('Bye for now')
```

Chocalate  
Chocalate  
Chocalate  
Chocalate  
Chocalate  
out of stock  
Bye for now

```
In [105...]: for i in range(1,11):
    if i == 6:
        break
    print(i)
```

```
1
2
3
4
5
```

```
In [109...]: for i in range(1,11):
    if i == 6:
        continue
    print('hello: ', i)
```

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

```
In [111...]: for i in range(1,11):
```

Cell In[111], line 2  
^  
**SyntaxError: incomplete input**

```
In [113...]: for i in range(1, 11):
    pass
```

**you need to print the number from 1 to 50 but dont print the number which is divisible by 3 or 5**

```
In [118...]: for i in range(1, 51):
    if i % 3 == 0:
        print(i)

    print('end')
```

```
3  
6  
9  
12  
15  
18  
21  
24  
27  
30  
33  
36  
39  
42  
45  
48  
end
```

```
In [124]:  
for i in range(1, 51):  
    if i % 3 == 0:  
        continue  
    print(i)  
  
print('bye')
```

```
1  
2  
4  
5  
7  
8  
10  
11  
13  
14  
16  
17  
19  
20  
22  
23  
25  
26  
28  
29  
31  
32  
34  
35  
37  
38  
40  
41  
43  
44  
46  
47  
49  
50  
bye
```

In [126...]

```
for i in range(1,51):  
    if i % 3 == 0 or i % 5 == 0:  
        continue  
  
    print(i)
```

```
1  
2  
4  
7  
8  
11  
13  
14  
16  
17  
19  
22  
23  
26  
28  
29  
31  
32  
34  
37  
38  
41  
43  
44  
46  
47  
49
```

```
In [128...]  
for i in range(0, 50):  
    if i % 2 == 0 or i % 5 == 0:  
        continue  
  
    print(i)  
print('end')
```

```
1  
3  
7  
9  
11  
13  
17  
19  
21  
23  
27  
29  
31  
33  
37  
39  
41  
43  
47  
49  
end
```

```
In [136...]:  
for i in range(1, 51):  
    if i % 2 == 0:  
        continue  
    else:  
        print(i)  
  
print('bye')
```

```
1  
3  
5  
7  
9  
11  
13  
15  
17  
19  
21  
23  
25  
27  
29  
31  
33  
35  
37  
39  
41  
43  
45  
47  
49  
bye
```

## Patterns

```
In [143...]: print('# # # #')
print('# # # #')
print('# # # #')
print('# # # #')
```

```
# # # #
# # # #
# # # #
# # # #
```

```
In [145...]: for i in range(0, 5):
    i = i + 1
    print('# # # # ')
```

```
# # # #
# # # #
# # # #
# # # #
# # # #
```

```
In [147...]: for i in range(0, 5):
    if i <= 5:
        print('# # # # ')
```

```
# # # #
# # # #
# # # #
# # # #
# # # #
```

```
In [151...]: for j in range(4):
    j = j + 1
    print('#')
```

```
#  
#  
#  
#
```

```
In [153...]: for j in range(4):
    j = j + 1
    print('# # # # ')
```

```
# # # #
# # # #
# # # #
# # # #
```

```
In [155...]: for j in range(4):
    print('#', end=" ")

for j in range(4):
    print('#', end=" ")
```

# # # # # # #

```
In [157...]  
for j in range(4):  
    print('#', end=" ")  
  
print()  
  
for j in range(4):  
    print('#', end=" ")  
  
# # # #  
# # # #
```

```
In [159...]  
for j in range(4):  
    print('#', end=" ")  
  
print()  
  
for j in range(4):  
    print('#', end=" ")  
print()  
for j in range(4):  
    print('#', end=" ")  
  
print()  
  
for j in range(4):  
    print('#', end=" ")  
  
# # # #  
# # # #  
# # # #  
# # # #
```

```
In [163...]  
for i in range(4):  
    for j in range(4):  
        print('#', end=" ")  
  
print()  
  
# # # #  
# # # #  
# # # #  
# # # #
```

```
In [165...]  
#Doubt-Explanation  
for i in range(4):  
    for j in range(i+1):  
        print('#', end=" ")  
    print()  
  
#  
# #  
# # #  
# # # #
```

```
In [167...]  
for i in range(1, 5):
```

```

print('# '*i)

#
# #
# # #
# # # #

In [169...]: for i in range(1, 5):
            for j in range(4):
                if i > j:
                    print('#', end = " ")
            print()

#
# #
# # #
# # # #

In [171...]: for i in range(4):
            for i in range(i):
                print('#', end=" ")

            print()

#
# #
# # #

In [173...]: for i in range(4):
            for j in range(4-i):
                print('#', end = " ")

            print()

#
# #
# #
# # #

In [177...]: for i in range(1, 5):
            print('#'*(5-i))

#####
#####
##
#

```

## For|Else in python

```

In [180...]: nums = [12,15,18, 22, 36]

for num in nums:
    if num % 5 == 0:
        print(num)

```

15

```
In [182...]: nums = [12,14,18,21,25,30,35]

for num in nums:
    if num % 5 == 0:
        print(num)
```

25

30

35

```
In [184...]: nums = [12,14,18,21,25,20]

for num in nums:
    if num % 5 == 0:
        print(num)
```

25

20

```
In [188...]: nums = [12,14,18,21,25,20]

for num in nums:
    if num % 5 == 0:
        print(num)
        break
```

25

```
In [194...]: nums = [12,14,18,21,20,25]

for num in nums:
    if num % 5 == 0:
        print(num)
        break
```

20

```
In [196...]: nums = [7,14,18,21,23,27]

for num in nums:
    if num % 5 == 0:
        print(num)
        break

else:
    print('Number not found')
```

Number not found  
 Number not found

```
In [198...]: nums = [10,14,18,21,20,27]

for num in nums:
    if num % 5 == 0:
        print(num)
        break

else:
    print('Number not found')
```

10

```
In [200...]: nums = [14,18,21,27]

for num in nums:
    if num % 5 == 0:
        print(num)
        break

else:
    print('Number not found')
```

Number not found

## prime number - how to check given number is prime number or not

```
In [207...]: num = 14

for i in range(2,num):
    # print('i =',i)
    if num % i == 0:
        print('Not prime Number')
        break
else:
    print('Prime Number')
```

Not prime Number

```
In [209...]: num = 13

for i in range(2, num):
    if num % 2 == 0:
        print('Not prime number')
        break

else:
    print('Prime number')
```

Prime number

## Array in Python

```
In [212... from numpy import *
arr = array([1,2,3,4,5])
print(arr)
print(type(arr))
```

```
[1 2 3 4 5]
<class 'numpy.ndarray'>
```

```
In [214... print(arr.dtype)
```

```
int32
```

```
In [226... arr = array([1, 2,3, 5.9])
```

```
In [228... print(arr.dtype)
```

```
float64
```

```
In [224... print(arr.dtype)
```

```
float64
```

```
In [230... arr = array([1,2,3, 5.9], float)
```

```
In [232... arr
```

```
Out[232... array([1. , 2. , 3. , 5.9])
```

```
In [234... arr2 = array([1,2,3.4,4.2,5.6], int)
```

```
In [236... arr2
```

```
Out[236... array([1, 2, 3, 4, 5])
```

```
In [238... import numpy as np
```

```
In [240... arr4 = np.linspace(0, 16,10)
arr4
```

```
Out[240... array([ 0.          ,  1.77777778,  3.55555556,  5.33333333,  7.11111111,
   8.88888889, 10.66666667, 12.44444444, 14.22222222, 16.        ])
```

```
In [244... arr5 = np.arange(0, 10, 2)
arr5
```

```
Out[244... array([0, 2, 4, 6, 8])
```

```
In [246... arr6 = np.zeros(5)
arr6
```

```
Out[246... array([0., 0., 0., 0., 0.])
```

```
In [248... arr7 = np.ones(5)
arr7
```

```
Out[248]: array([1., 1., 1., 1., 1.])
```

In [ ]:

In [ ]: