

# loops

```
In [1]: print('hello')
        print('hello')
        print('hello')
        print('hello')
        print('hello')
```

```
hello
hello
hello
hello
hello
```

## while loop

```
In [2]: i=1 #initializing
        while i<=5:    #condition
            print('data science')
            i=i+1 # increment
```

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

```
In [2]: i=5 #initializing
        while i>=1:    #condition
            print('data science')
            i=i-1 # decrement
```

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

```
In [5]: i=1 #initializing
        while i<=5:    #condition
            print('data science:',i)
            i=i+1 # increment
```

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

```
In [ ]: i=5 #initializing
        while i>=1:    #condition
            print('data science:',i)
            i=i-1 # increment
```

```
In [8]: i=1
        while i<=5:
```

```

print('data science')
j=1
while j<=4:
    print('Technology')
    j=j+1
i=i+1
print()
#the output which we got is lengthy, to them in one line, let's refer the below

```

data science  
Technology  
Technology  
Technology  
Technology

data science  
Technology  
Technology  
Technology  
Technology

data science  
Technology  
Technology  
Technology  
Technology

data science  
Technology  
Technology  
Technology  
Technology

data science  
Technology  
Technology  
Technology  
Technology

In [16]:

```

i=1
while i<=5:
    print('data science',end=" ") #when we mention 'end', then new line will not
    j=1
    while j<=4:
        print('Technology',end=" ")
        j=j+1
    i=i+1
    print()

```

data science Technology Technology Technology Technology  
data science Technology Technology Technology Technology  
data science Technology Technology Technology Technology  
data science Technology Technology Technology Technology  
data science Technology Technology Technology Technology

In [17]:

```

# Lets code while loop using some numbers.
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 [19]: 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 [20]: name = 'hello'

for i in name:
    print(i)

```

```

h
e
l
l
o

```

```

In [22]: name = 'hello'

for list in name:
    print(list)
# i or list is a variable that is assigned

```

```

h
e
l
l
o

```

```

In [23]: name1 = [1,3.5,'hello'] #print the value individually

for i in name1:
    print(i)

```

```

1
3.5
hello

```

```
In [24]: for i in [2, 3, 7.8, 'hi']:
        print(i)
```

```
2
3
7.8
hi
```

```
In [25]: range(7)
```

```
Out[25]: range(0, 7)
```

```
In [26]: for i in range(7):
        print(i)
```

```
0
1
2
3
4
5
6
```

```
In [27]: for i in range(2,5):
        print(i)
```

```
2
3
4
```

```
In [28]: for i in range(1,10,3):
        print(i)
```

```
1
4
7
```

```
In [32]: # print the value according to the given range
        for i in range(2,10):
            print(i)
```

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

```
In [33]: # print the value which is divisible by 5

        for i in range(1,51):

            if i%5==0 :
                print(i)
```

5  
10  
15  
20  
25  
30  
35  
40  
45  
50

```
In [35]: # print the values according to the given range while skipping the value which i  
for i in range(1,51):  
  
    if i%5!=0 :  
        print(i)
```

1  
2  
3  
4  
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

BREAK || CONTINUE || PASS

- PASS STATEMENT = skips block of code( function, class etc)
- CONTINUE STATEMENT= skips 1 step/iteration during loop
- BREAK STATEMENT= jumps out of the function/loop (if you apply break statment in a loop then it will end the loop)

## BREAK

In [37]: *# code: user asks chocolate from vendor machine*

```
x = int(input('How many chocolates you want:?'))

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

chocolate  
chocolate  
chocolate

In [41]: *# dua = 5 # the machine has only 5 chocolate*

```
x = int(input('How many chocolates you want:?'))

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

# if you check the user wants 7 chocolates but availabe chocolates are 5 but we
# in this code we just declared but we didn't apply any condition to it
```

chocolate  
chocolate  
chocolate  
chocolate  
chocolate  
chocolate  
chocolate

In [45]: *available\_chocolate = 5 # the machine has only 5 chocolate,*  
*#so even if we give as 7 in output it will only print upto 5 chocolates*

```
x = int(input('How many chocolates user want:?'))

i = 1
while i<=x:

    if i>available_chocolate: # stops the execution below but not execution of e
                                # just come out of while loop
        break # break is a statement | means it jump out of the loop
    print('chocolate')
    i += 1

print('bye for now')
```

```
chocolate
chocolate
chocolate
chocolate
chocolate
bye for now
```

```
In [46]: available_chocolate = 5 # the machine has only 5 chocolate,
        #so even if we give as 7 in output it will only print upto 5 chocolates

        x = int(input('How many chocolates user want:'))

        i = 1
        while i<=x:

            if i>available_chocolate: # stops the execution below but not execution of e
                # just come out of while loop
                print('out of stock')
                break # break is a statement | means it jump out of the loop
            print('chocolate')
            i += 1

        print('bye for now')
```

```
chocolate
chocolate
chocolate
chocolate
chocolate
out of stock
bye for now
```

```
In [47]: for i in range(1,11):
        print(i)
```

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

```
In [48]: for i in range(1,11):
        if i == 6:
            break
        print(i)
```

```
1
2
3
4
5
```

## CONTINUE

in continue, loop won't be terminate fully instead excludes the assign number & gives you remaining entire output

```
In [49]: for i in range(1,11):  
        if i == 3:  
            continue  
        print(i)
```

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

```
In [50]: for i in range(1,11):  
        if i == 6:  
            continue  
        print('hello : ',i)
```

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

## PASS

PASS Statement - pass the code & won't print any output

```
In [51]: for i in range(1,11):
```

```
Cell In[51], line 1  
    for i in range(1,11):  
    ^  
_IncompleteInputError: incomplete input
```

```
In [52]: for i in range(1,11):  
        pass
```

```
In [ ]:
```

```
In [53]: 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 [55]:

```
for i in range(1,20):

    if i%3 == 0:
        continue
    print(i)
print('end')
```

```
1
2
4
5
7
8
10
11
13
14
16
17
19
end
```

In [58]:

```
for i in range(1,30):

    if i%3 == 0 or i%5 == 0:
        continue
    print(i)
    #print('end')
    # it will skip all the value which is divisible by 3 or 5
```

1  
2  
4  
7  
8  
11  
13  
14  
16  
17  
19  
22  
23  
26  
28  
29

```
In [59]: for i in range(1,50):  
        if i%3 == 0 or i%5 == 0:  
            continue  
        print(i)  
print('end')  
# it doesn't print the value which is divisible by both 3 & 5 (15)
```

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  
end

```
In [61]: # the below code doesn't print the values which are even numbers that means print  
  
for i in range(1,21):  
  
    if (i%2 == 0):  
        #print('even')  
        continue
```

```
    else:
        print(i)
print('bye')
```

1  
3  
5  
7  
9  
11  
13  
15  
17  
19  
bye

In [63]: *# the below code print the values as "even" instead of even numbers that means p*

```
for i in range(1,21):

    if (i%2 == 0):
        print('even')
        continue
    else:
        print(i)
print('bye')
```

1  
even  
3  
even  
5  
even  
7  
even  
9  
even  
11  
even  
13  
even  
15  
even  
17  
even  
19  
even  
bye

## Printing PATTERNS

In [64]: 

```
print('# # # #')
print('# # # #')
print('# # # #')
print('# # # #')
```

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

```
In [65]: for i in range(1,5):  
         i=i+1  
         print('# # # # ')
```

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

```
In [66]: for i in range(1,5):  
         if i<=5:  
             print('# # # #')
```

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

```
In [67]: for j in range(4):  
         print('#')
```

```
#  
#  
#  
#
```

```
In [68]: for j in range(4):  
         print('# # # #')
```

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

```
In [69]: for j in range(4):  
         print('#', end = " ")
```

```
# # # #
```

```
In [70]: for j in range(4):  
         print('#', end=" ")  
  
         for j in range(4):  
             print('#', end=" ")
```

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

```
In [71]: for j in range(4):  
         print('#', end=" ")  
  
         print()  
  
         for j in range(4):  
             print('#', end=" ")
```

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

```
In [72]: 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 [74]: #optimized code for the above code and to print the below code
          for i in range(4):
              for j in range(4):
                  print('#', end=" ")

                  print()

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

```
In [75]: for i in range(4):
          for j in range(i+1):
              print('#', end = " ")

              print()

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

```
In [76]: for i in range(1,5):
          print("# " * i)

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

```
In [77]: for i in range(1,5):
          for j in range(4):
              if i>j:
                  print("#",end=" ")

              print()
```

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

```
In [80]: for i in range(4):  
         for j in range(i):  
             print('#', end=" ")  
         print()
```

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

```
In [81]: for i in range(4):  
         for j in range(i+1):  
             print('#', end=" ")  
         print()
```

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

```
In [82]: for i in range(4):  
         for j in range(4-i):  
             print('#', end=" ")  
         print()
```

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

```
In [83]: for i in range(1,5):  
         print("# "*(5-i))
```

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

```
In [ ]:
```