LOOP

Two Types Of Loop 1)while loop 2)for loop while loop - always apply when you have condition

LOOPS -- in programing 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 [1]:
```
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 [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 [3]:
```
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 [4]:
```
i = 1   #initializing
while i<=5: #condition
    print('data science:',i)
    i = i + 1     #decrement
```

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

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

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

In [6]:
```
i = 1
while i<=5:
    print('data science') #when we mention end then new line will not create
    j = 1
    while j<=4:
        print('technology')
        j = j + 1
    i = i + 1
    print()

#the output which we got is very lengthy but how to make one line lets refer to bel
```

```
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 [7]:
```
i = 1
while i<=5:
    print('data science', end = "  ") #when we mention end then new line will not c
    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 [8]:
```
# lets use while loop usig 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 [9]:
```
# lets use while loop usig some numbers
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 certaion some condition but for loop it will work with sequence (list, string,int)

In [10]:
```
name = 'nit'
for i in name:
    print(i)
```

```
n
i
t
```

In [11]:
```
name1 = [1,3.5,'hello'] #I want print the value individually
for i in name1:
    print(i)
```

```
1
3.5
hello
```

In [12]:
```
range(5)
```

Out[12]:
```
range(0, 5)
```

In [13]:
```
for i in range(5):
    print(i)
```

```
0
1
2
3
4
```

In [14]:
```
for i in range(2,5):
    print(i)
```

```
2
3
4
```

In [15]:
```
for i in range(1,10,3):
    print(i)
```

```
1
4
7
```

In [16]:
```python
# print the value which is divisible by 5
for i in range(1,21):
    print(i)
```

```
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
```

In [17]:
```python
# 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 [18]:
```python
# print the value which is divisible by 5 i dont want that value
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
```

LETS DISCUSS ABOUT 3 KEYWORDS -- BREAK || CONTINUE || PASS BREAK STATEMNT - if you apply break statment 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 [21]:
```
# write the code user ask chocklet from vendor machne write the basic code
x = int(input('How many choclets you want:?'))
i=1
while i<=x:
    print('choclet')
    i+=1
```

```
choclet
choclet
choclet
choclet
choclet
```

- If the user says i need 10 choclet but vending machine dont have 10 choclate & machine has only 5 choclate so what you do on those scenario
- We have 3 choice now (eiter stop the transaction by you or you can give only 5 choclate) & may be vendor machine display the result as we are out of the stock
- Now lets try in the code

In [23]:
```
ava = 5  #the machine has only 5 choclet
x = int(input('How many choclets you want:?'))
i=1
while i<=x:
    print('choclet')
    i+=1
# if you check the user wants 10 choclets  but availabe choclet is 5 but we got out
# in this code we just declare but we dint apply any condition to it
```

```
choclet
choclet
choclet
choclet
choclet
choclet
choclet
```

In [28]:
```
available_choclet = 5 # the machine has only 10 candis

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

i = 1
while i<=x:

    if i>available_choclet: # we stop the execution but which code execution not en
        break # break is statement | means jump out of the loop
    print('choclet')
    i += 1

print('bye for now')
```

```
choclet
choclet
choclet
choclet
choclet
bye for now
```

In [29]:
```
available_choclet = 5 # the machine has only 10 candis

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

i = 1
while i<=x:

    if i>available_choclet: # we stop the execution but which code execution not en
        print('out of stock')
        break # break is statement | means jump out of the loop
```

```
    print('choclet')
    i += 1

print('bye for now')
```

```
choclet
choclet
choclet
choclet
choclet
out of stock
bye for now
```

In [30]:
```
for i in range(1,11):
    print(i)
```

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

- i dont want 11 number i want only 5 number for the range of 1 to 10

In [33]:
```
for i in range(1,11):
    if i == 6:
        break
    print(i)
```

```
1
2
3
4
5
```

In [34]:
```
# in continue loop wont be terminate & exclue the assign number it give you entire
```

In [35]:
```
for i in range(1,11):
    if i == 3:
        continue
    print(i)
```

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

In [36]:
```
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
```

In [37]:
```
#PASS statement-pass the code & it want go (code give you the error)
```

In [38]:
```
for i in range(1,11):
```

```
  Cell In[38], line 1
    for i in range(1,11):
                         ^
SyntaxError: incomplete input
```

In [39]:
```
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 [42]:
```
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 [43]:
```
for i in range(1,51):
    if i%3 == 0:
        continue
```

```
    print(i)
print('end')
```

```
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
end
```

In [44]:
```
for i in range(1,51):
    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
31
32
34
37
38
41
43
44
46
47
49
```

In [45]:
```python
for i in range(1,50):
    if i%3 == 0 or i%5 == 0:
        continue
    print(i)
print('end')
# when you apply and you wont get 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 [46]:
```python
# i dont want to print the values which are even numbers that means print only odd
for i in range(1,51):
    if (i%2 == 0):
        #print('even')
        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
```

PRINTING PATTERN IN PYTHON

In [47]:
```
print('# # # #')
print('# # # #')
print('# # # #')
print('# # # #')
```

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

In [48]:
```
for i in range(1,5):
    i=i+1
    print('# # # #')
```

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

In [49]:
```
for i in range(1,5):
    if i<=5:
        print('# # # #')
```

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

In [50]:
```
for j in range(4):
    print('#')
```

```
#
#
#
#
```

In [51]:
```
for j in range(4):
    print('# # # #')
```

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

In [52]:
```
for j in range(4):
    print('#', end = " ")
```

```
# # # #
```

In [53]:
```
for j in range(4):
    print('#', end=" ")
for j in range(4):
    print('#', end=" ")
```

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

In [54]:
```
for j in range(4):
    print('#', end=" ")
print()
for j in range(4):
    print('#', end=" ")
```

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

In [55]:
```
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 [56]:
```
for i in range(4):
    for j in range(4):
        print('#', end="  ")
    print()
# use debug mode in pycharm
```

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

In [57]:
```
for i in range(4):
    for j in range(i+1):
        print('#', end = " ")
    print()
```

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

In [58]:
```
for i in range(1,5):
    print("# "*i)
```

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

In [59]:
```
for i in range(1,5):
    for j in range(4):
        if i>j:
            print("#",end=" ")
    print()
```

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

In [60]:
```
list(range(5))
```

Out[60]:
```
[0, 1, 2, 3, 4]
```

In [61]:
```
for i in range(4):
    for j in range(i):
        print('#', end="  ")
    print()
```

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

In [62]:
```
for i in range(4):
    for j in range(i+1):
        print('#', end="  ")
    print()
```

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

In [63]:
```
for i in range(4):
    for j in range(4-i):
        print('#', end="  ")
    print()
```

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

In [64]:
```
for i in range(1,5):
    print("# "*(5-i))
```

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

for else

For|Else in python In other language for else not supportable but in python it is supportable eg- lets print the number from 1- 20 & we dont want print number which is divisible by 5

In [1]:
```
nums = [12,15,18,21,26, 30, 40]

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

```
15
30
40
```

In [2]:
```
nums = [12,14,18,21,25,30,35]

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

```
25
30
35
```

In [3]:
```
nums = [12,14,18,21,25,20]

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

```
25
20
```

In [4]:
```
nums = [12,14,18,21,20,25]

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

```
20
```

In [5]:
```
nums = [12,14,18,21,20,25]

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

```
20
```

In [6]:
```
nums = [7,14,18,21,23,27,29] #hear there is no number which is divisible by 5 we go

for num in nums:
    if num % 5 == 0:
        print(num)
        break
    else:
        print('Number Not Found') #every iteration it cheking condition
```

```
Number Not Found
Number Not Found
Number Not Found
Number Not Found
Number Not Found
Number Not Found
Number Not Found
```

In [7]:
```
nums = [7,14] #hear there is no number which is divisible by 5 we got output as bla
for num in nums:
    if num % 5 == 0:
        print(num)
        break
    else:
        print('Number Not Found') #every iteration it cheking condition
```

```
Number Not Found
Number Not Found
```

In [8]:
```
nums = [7,14,18,21,23,27] #hear there is no number which is divisible by 5 we got o
```

```
for num in nums:
    if num % 5 == 0:
        print(num)
        break
else:
        print('Number Not Found') # hear else we dont write in if block but we can
```

```
Number Not Found
```

In [9]:
```
nums = [10,14,18,21,20,27] #hear there is no number which is divisible by 5 we got

for num in nums:
    if num % 5 == 0:
        print(num)
        break
else:
        print('Not Found')
```

```
10
```

In [10]:
```
nums = [10,14,18,21,20,27,30] #hear there is no number which is divisible by 5 we g

for num in nums:
    if num % 5 == 0:
        print(num)
        #break
else:
        print('Not Found')
```

```
10
20
30
Not Found
```

In [11]:
```
nums = [10,14,18,21,20,27] #hear there is no number which is divisible by 5 we got
for num in nums:
    if num % 5 == 0:
        print(num)
        break
else:
        print('Not Found')
```

```
10
```