Day-19

While loop programs

```
# WAP to find the factorial of a given integer / to find the prod of n natural numbers.
# Example:  5!   --- 5*4*3*2*1
# Example: product upto 5 --- 1*2*3*4*5
'''
n = 5
prod = 1
while n>0:
   prod = prod * n
   n = n - 1
print(prod)'''

'''
i = 1
prod = 1
while i<=5:
   prod = prod * i
   i = i + 1
print(prod)'''

# WAP to extract the uppercase character from the string.
'''
st = input('Enter the string: ')
i = 0
out = ''
while i<len(st):
   if 'A'<=st[i]<='Z':
      out = out + st[i]
   i +=1
print(out)'''
```

To toggle the string.

```
ord('A')
65
ord('a')
97
chr(65)
'A'
chr(ord('A')+32)
'a'
chr(ord('B')+32)
'b'
chr(ord('C')+32)
'c'
chr(ord('a')-32)
'A'
chr(ord('b')-32)
'B'
```

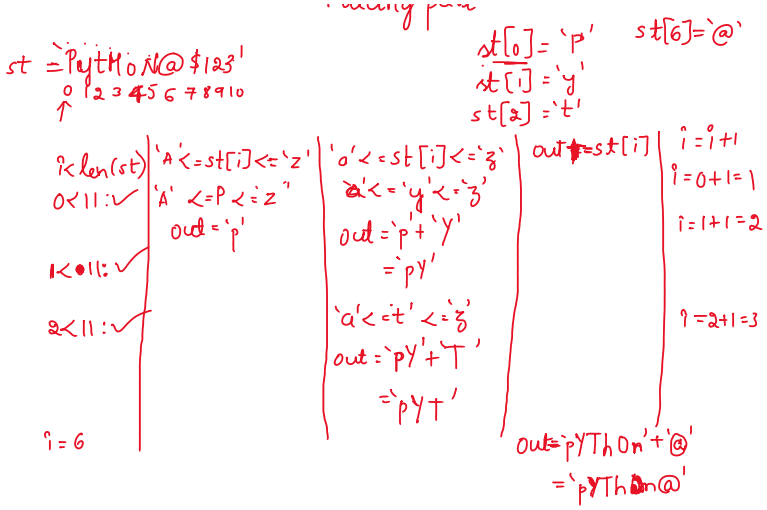
Tracing part

```
# WAP to toggle the string.
'''
st = input('Enter the string: ')
```

st = 'PythON@$123'
0 1 2 3 4 5 6 7 8 9 10

st[0] = 'P' st[6] = '@'
st[1] = 'y'

```
# WAP to toggle the string.
'''
st = input('Enter the string: ')
i = 0
out = ''
while i<len(st):
    if 'A'<=st[i]<='Z':
        out += chr(ord(st[i])+32)
    elif 'a'<=st[i]<='z':
        out += chr(ord(st[i])-32)
    else:
        out += st[i]
    i += 1
print(out)'''
```




```
# WAP to find the sum of all the integers in a list.
'''
l = eval(input('Enter the list: '))
sum = 0
i = 0
while i<len(l):
    if type(l[i]) == int:
        sum += l[i]
    i += 1
print(sum)'''
```

Day-20

For loop:
--- It is self-iterative loop.

Advantage:

- It will allow us to use all the MVDT but in while loop it considers only string, list and tuple.
- No need of initialization and updation.

Range():
--- It is used to create a sequence of integers between the given value.
Syntax:

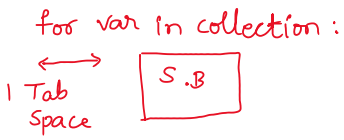
```
range(SV, EV+1,updation)
range(SV, EV-1,updation)
```

- If updation == +1
  range(SV, EV+-1)

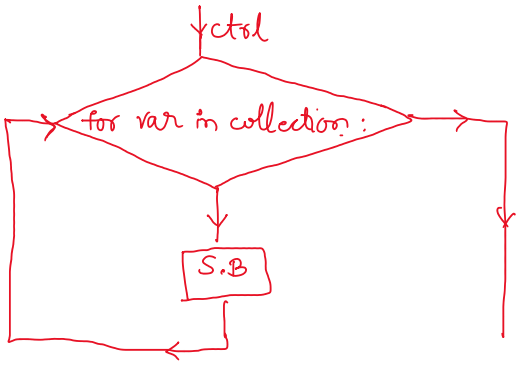
- If SV==0
  range(EV+-1, updation)

```
range(1,10+1)
range(1, 11)
list(range(1,11))
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
tuple(range(1,11))
(1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
list(range(10,1-1,-1))
[10, 9, 8, 7, 6, 5, 4, 3, 2, 1]
list(range(0,10+1,1))
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
list(range(10,0-1,-1))
[10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0]
list(range(10,-1,-1))
[10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0]
```

Syntax:



Flow Diagram:



Programs:

```
# For loop

# Practice programs
'''
for i in [10,2.3,6+7j,78]:
   print(i)'''

'''
for i in (12,34):
   print(i)'''

'''
for i in {17,3.4,78,32}:
   print(i)'''

'''
for i in {'a':10,'b':20,'c':30}:
   print(i)'''

'''
for i in 'sakshi':
   print(i,end=' ')'''

'''
for i in range(1,6):
   print(i) '''

# Actual programs of loop programs

# WAP to find the length of the collection without using len function.
'''
c = eval(input('Enter the collection: '))
count = 0
for i in c:
   count+=1
print(count)'''

# WAP to extract the vowels from the given string.
'''
s = input('Enter the string: ')
out = ''
for i in s:
   if i in 'aeiouAEIOU':
      out += i
print(out)'''

# WAP to replace space by and underscore in a given string.
'''
s = input('Enter the string: ')
out = ''
```

```
for i in s:
   if i == ' ':
      out += '_'
   else:
      out += i
print(out)'''

# WAP to check whether the string is palindrome or not without using slicing.
'''
s = input('Enter the string: ')
rev = ''
for i in s:
   rev = i + rev
if rev == s:
   print('palindrome')
else:
   print('not palindrome')'''

# WAP to remove the duplicates values from the list.
'''
l = eval(input('Enter the list: '))
out = []
for i in l:
   if i not in out:
      out += [i]
print(out)'''
```

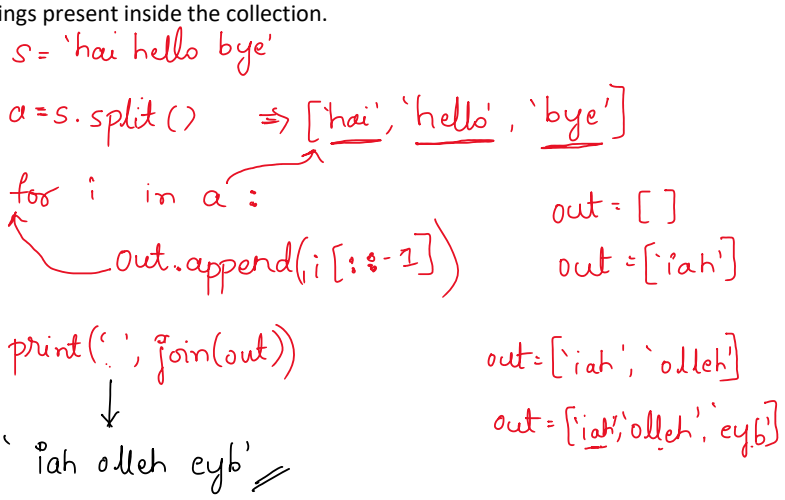
Day-21

```
# Get the following output.
'''
Input : (12,3.4,'hello',2+3j,'python','bye',False)
Output : {'hello': 5, 'python': 6,'bye':3} '''

'''
t = eval(input('Enter the tuple: '))
out = {}
for i in t:
   if type(i) == str:
      out[i] = len(i)
print(out)'''

# Get the following output.
'''
Input : [12,3.4,'hello',2+3j,'python','bye',False]
Output : {'hello': 'ho', 'python': 'pn','bye':'be'} '''

'''
l = eval(input('Enter the list: '))
out = {}
for i in l:
   if type(i) == str:
      out[i] = i[0]+i[-1]
print(out)'''

# Get the following output.
'''
Input : 'aPpLe#123'
Output : {'a':'A', 'P':'p', 'p':'P',  'L':'l', 'e':'E'} '''

'''
s = input('Enter the string: ')
out = {}
for i in s:
   if 'a'<=i<='z':
      out[i] = chr(ord(i)-32)
   elif 'A'<=i<='Z':
```

```
    out[i] = chr(ord(i)+32)
print(out) '''
```

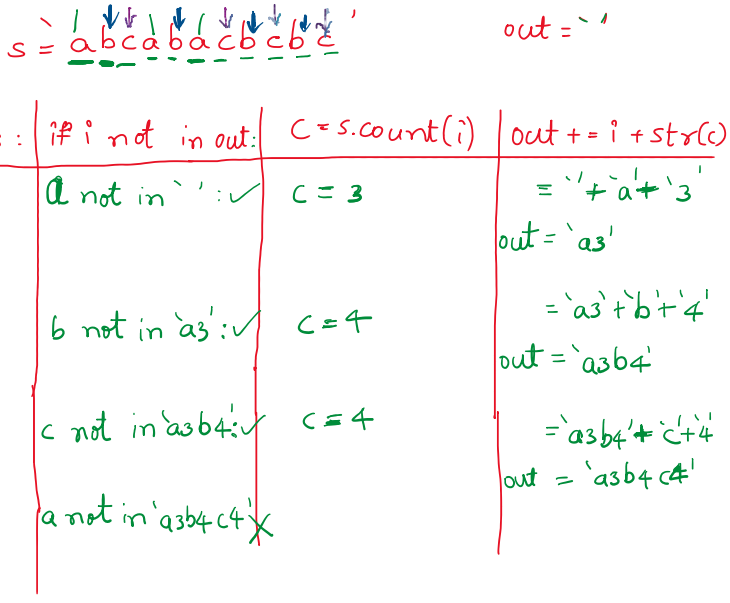
Note:

- Split() --- it is used to split each word present in the string
- Join() --- it is used to join/merge the strings present inside the collection.




```
# Get the following output.
'''
Input : 'hai hello bye'
Output : 'iah olleh eyb'      '''

'''
s = input('Enter the string: ')
out = []
a = s.split()
for i in a:
   out.append(i[::-1])
print(' '.join(out)) '''
```

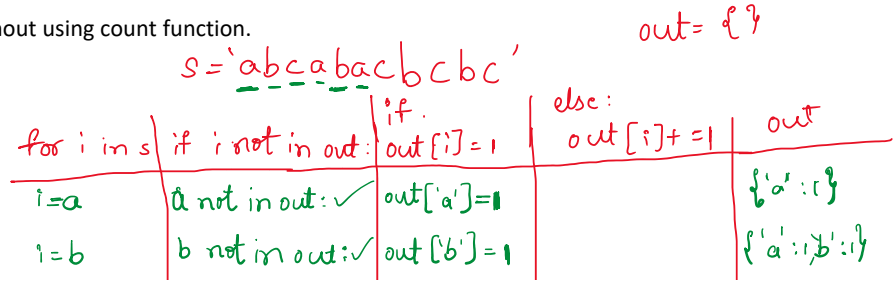
```
# Get the following output.
'''
Input : 'Everyone Loves python'
Output : 'Ee Ls pn'      '''

'''
s = input('Enter the string: ')
out = []
a = s.split()
for i in a:
   out.append(i[0]+i[-1])
print(' '.join(out)) '''
```



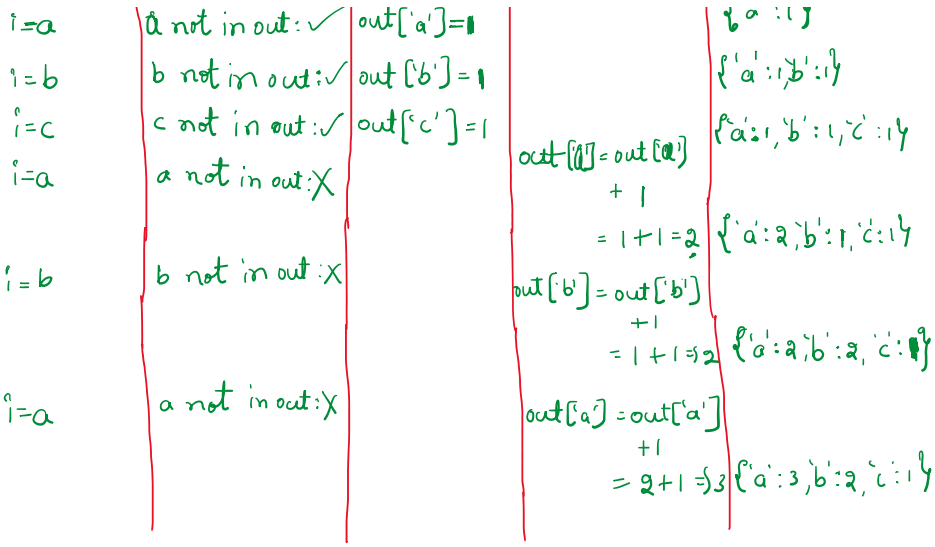

```
# Get the following output.
'''
Input : 'abcabacbcbc'
Output : 'a3b4c4'      '''

s = input('Enter the string: ')
out = ''
for i in s:
   if i not in out:
      c = s.count(i)
      out += i + str(c)
print(out)
```

Count() --- It will count the number of occurrence of character in a string.

```
# Get the following output without using count function.
'''
Input : 'abcabacbcbc'
Output : {'a':3,'b':4,'c':4}     '''

s =  input('Enter the string: ')
out = {}
for i in s:
   if i not in out:
```



```
out = {}
for i in s:
    if i not in out:
        out[i] = 1
    else:
        out[i] += 1
print(out)
```




```
# WAP to print all the divisors of a given number.
'''
n = int(input('Enter the number: '))
for i in range(1,n+1):
    if n % i == 0:
        print(i)'''
```

Day - 22:

Nested for loop:

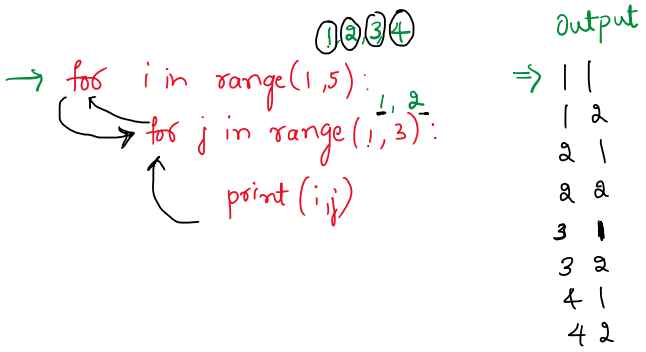
--- It is a phenomenon where we write a for loop inside another for loop.

Syntax:

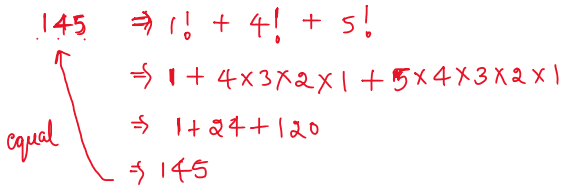
```
for var1 in collection :
    for var2 in collection :
        SB
```

Example:

```
# Nested for loop

for i in range(1,5):
    for j in range(1,3):
        print(i,j)
```



Strong Number: If the number is equal to the sum of the factorial of individual digits, then we can call that number as Strong Number.



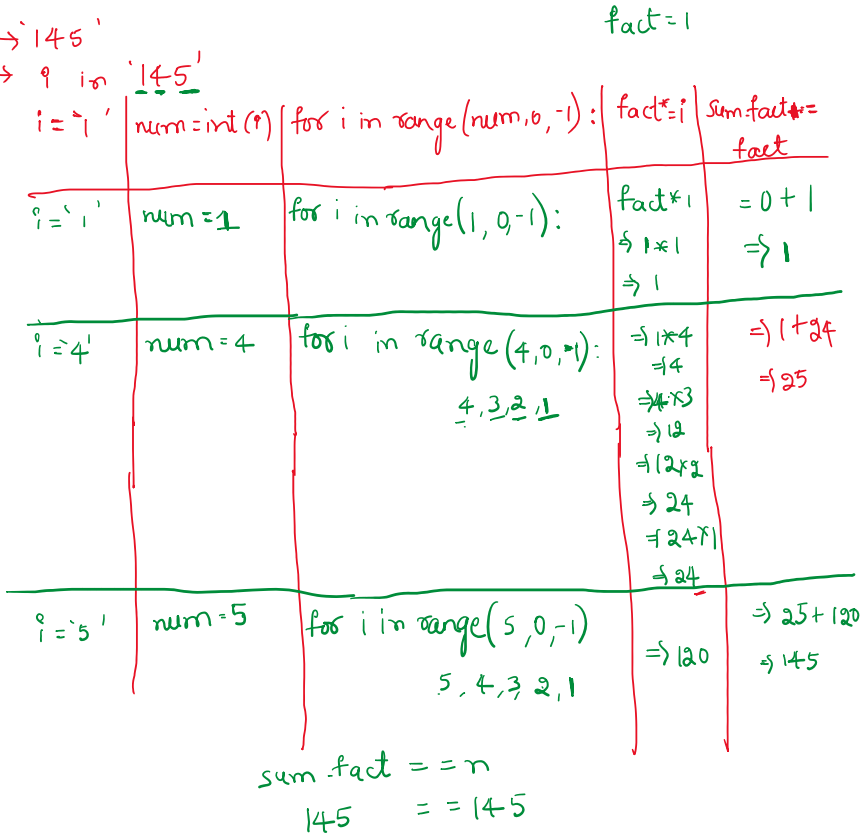
1st for loop ⇒ extract individual digits

2nd for loop ⇒ finding factorial

```
# WAP to check whether the number is strong number or not.

n =  int(input('Enter the number: '))
sum_fact = 0
```

fact = 1

```
n =  int(input('Enter the number: '))
sum_fact = 0
a = str(n)
for i in '145':
    num = int(i)
    fact = 1
    for i in range(num,0,-1):
        fact *= i
    sum_fact += fact
if sum_fact == n:
    print('Strong number')
else:
    print('Not strong number')
```




```
# Get the following output.
'''
Input : [12, 'program',4+2j, False,'holiday']
Output : {'program' : 'oa', 'holiday' : 'oia'}  '''

'''
l = eval(input('Enter the list: '))
out = {}
for i in l:
    if type(i) == str:
        vow = ''
        for j in i:
            if j in 'AEIOUaeiou':
                vow += j
        out[i] = vow
print(out)  '''

#Assignment
# Get the following output.
'''
Input : [12, 'program',4+2j, False,'holiday']
Output : {'program' : 'prgrm', 'holiday' : 'hldy'}  '''


#Assignment
# Get the following output.
'''
Input : [12, 'program',4+2j, False,'holiday']
Output : {'program' : 'PROGRAM', 'holiday' : 'HOLIDAY'}  '''
```

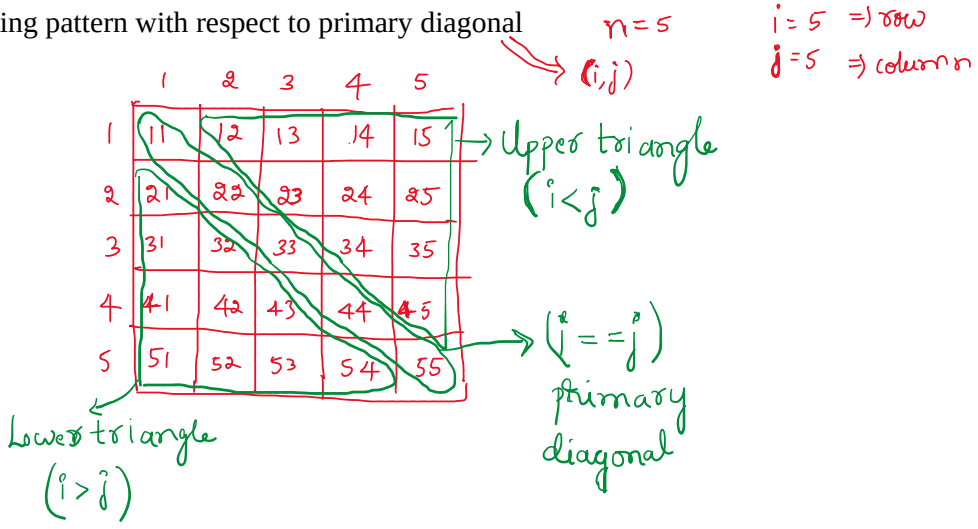
Patterns:

--- Using Nested for loop to print some unique structure or pattern.

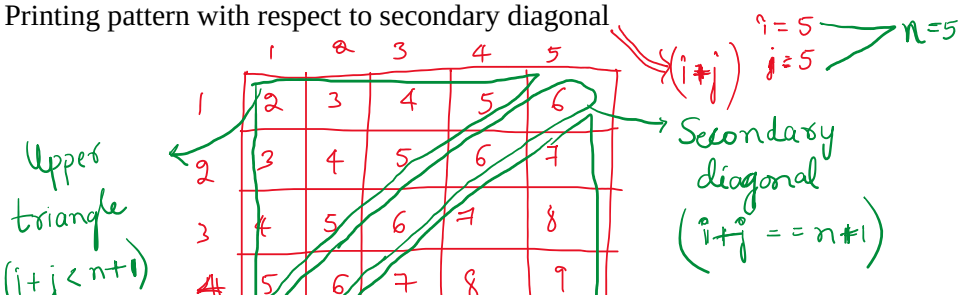
Programs:

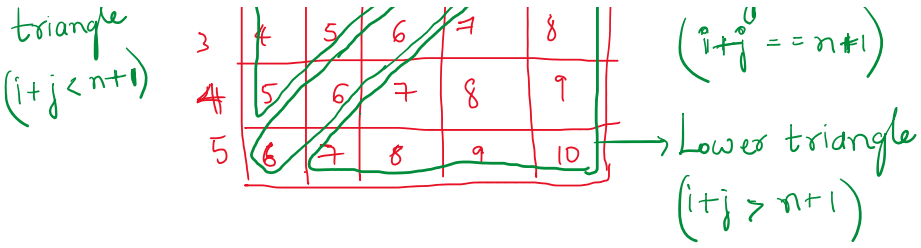
```
# Pattern
'''
* * *

for i in range(1,4):
   print('*',end = ' ') '''


'''
* * *
* * *
* * *

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

'''
* * *
* * *
* * *
* * *
* * *

for i in range(1,6):
   for j in range(1,4):
      print('*',end = ' ')
   print()'''

'''
* * * * *
* * * * *

for i in range(1,3):
   for j in range(1,6):
      print('*',end = ' ')
   print() '''
```

- Printing pattern with respect to primary diagonal



Printing pattern with respect to secondary diagonal





Patterns:

```
'''
*
 *
  *
   *
    *
'''

n = int(input('Enter the number: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i == j:
            print('*', end = ' ')
        else:
            print(' ', end = ' ')
    print()
```

```
'''
@
* @
* * @
* * * @
* * * * @
'''

n = int(input('Enter the number: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i == j:
            print('@', end = ' ')
        elif i > j:
            print('*', end = ' ')
        else:
            print(' ', end = ' ')
    print()
```

```
'''
# # # # $
# # # $ &
# # $ & &
# $ & & &
$ & & & &
'''

n = int(input('Enter the number: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i+j == n+1:
            print('$', end = ' ')
        elif i+j > n+1:
            print('&', end = ' ')
        elif i+j < n+1:
            print('#', end = ' ')
```

```
    print()

'''
* * * * *
*     *
*     *
*     *
* * * * *
'''
n = int(input('Enter the num: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i == 1 or j == 1 or i == n or j ==n:
            print('*',end = ' ')
        else:
            print(' ',end = ' ')
    print()

'''
1 0 0 0 0
0 1 0 0 0
0 0 1 0 0
0 0 0 1 0
0 0 0 0 1
'''
n = int(input('Enter the num: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i ==j:
            print('1',end = ' ')
        else:
            print('0',end = ' ')
    print()

'''



*     *
 *   *
  *
 *   *
*     *
'''
n = int(input('Enter the num: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i == j or i+j == n+1:
            print('*',end = ' ')
        else:
            print(' ',end = ' ')
    print()


'''
* * * * *
*     *
*     *
*     *
* * * * *
'''
n = int(input('Enter the num: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i == 1 or j==1 or i==n or j==n:
            print('*',end = ' ')
        else:
            print(' ',end = ' ')
    print()
```

```
'''
  *
  *
* * * * *
  *
  *
'''
n = int(input('Enter the num: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i == n//2+1 or j == n//2+1:
            print('*',end = ' ')
        else:
            print(' ',end = ' ')
    print()


'''
* * * * * * * * *
*  *  *  *  *
*   *  *  *   *
*    ***    *
* * * * * * * * *
*    ***    *
*   *  *  *   *
*  *  *  *  *
* * * * * * * * *

'''
n = int(input('Enter the num: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i==1 or j==1 or i==n or j==n or i==j or i+j==n+1 or i==n//2+1 or j==n//2+1:
            print('*',end = ' ')
        else:
            print(' ',end = ' ')
    print()
```

Day-23

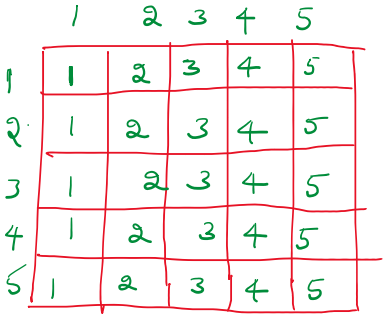
```
'''
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5

n = int(input('Enter the number: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        print(j,end = ' ')
    print()  ''
'''
```

n=5

(1,2,3,4,5) → row

(1,2,3,4,5) → column

end = '\n'



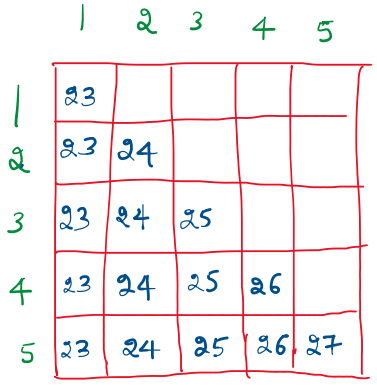

```
'''
1 1 1 1 1
2 2 2 2 2
3 3 3 3 3
4 4 4 4 4
5 5 5 5 5

n = int(input('Enter the number: '))
for i in range(1,n+1):
```

```
    for j in range(1,n+1):
        print(i,end = ' ')
    print()  '''


'''
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
'''

n = int(input('Enter the number: '))
for i in range(1,n+1):
    for j in range(1,n+1):
        if i == j or i > j:
            print(j,end = ' ')
        else:
            print(' ',end = ' ')
    print()

'''
23
23 24
23 24 25
23 24 25 26
23 24 25 26 27
'''

n = int(input('Enter the number: '))
for i in range(1,n+1):
    k = 23
    for j in range(1,n+1):
        if i == j or i > j:
            print(k,end = ' ')
            k += 1
        else:
            print(' ',end = ' ')
    print()
```

n=5

(1,2,3,4,5)

(1,2,3,4,5)




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

n = int(input('Enter the number: '))
for i in range(1,n+1):
    k = 5
    for j in range(1,n+1):
        if i+j == n+1 or i+j > n+1:
            print(k,end = ' ')
            k -= 1
        else:
            print(' ',end = ' ')
    print()


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

```
'''

n = int(input('Enter the number: '))
for i in range(1,n+1):
   k = 5
   for j in range(1,n+1):
      if i+j == n+1 or i+j > n+1:
         print(k,end = ' ')
         k -= 1
      else:
         print(' ',end = ' ')
   print()

'''
*     *
* *   * *
*   *   *
*     *
*     *
'''

n = int(input('Enter the number: '))
for i in range(1,n+1):
   for j in range(1,n+1):
      if j == 1 or j == n or (i == j and i <= n//2+1 ) or (i+j == n+1 and i <= n//2+1) :
         print('*',end = ' ')
      else:
         print(' ',end = ' ')
   print()

'''
*     *
*     *
*   *   *
* *   * *
*     *
'''

n = int(input('Enter the number: '))
for i in range(1,n+1):
   for j in range(1,n+1):
      if j == 1 or j == n or (i == j and i >= n//2+1 ) or (i+j == n+1 and i >= n//2+1) :
         print('*',end = ' ')
      else:
         print(' ',end = ' ')
   print()


'''
* * * *   *     *
*   *   *     *
*   * *   *   *   *
* * * *   * *   * *
        *   *     *
'''

n = int(input('Enter the number: '))
for i in range(1,n+1):
   for j in range(1,n+1):
      if (j == 1 and i != n) or (i == 1 and j != n) or (i == n-1 and j != n) or (j == n-1 and i != n) or (i == j and i >= n//2+
1 ) :
         print('*',end = ' ')
      else:
         print(' ',end = ' ')

   print(end = '  ')

   for j in range(1,n+1):
      if j == 1 or j == n or (i == j and i >= n//2+1 ) or (i+j==n+1 and i >= n//2+1):
```