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

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

In [2]:
```python
k=65
for i in range (4):
    for j in range (i+1):
        print(chr(k),end=" ")
        k+=1
    print()
```

```
A
B C
D E F
G H I J
```

In [3]:
```python

for i in range (4):
    k=65
    for j in range (i+1):
        print(chr(k),end=" ")
        k+=1
    print()
```

```
A
A B
A B C
A B C D
```

In [4]:
```python
for i in range(1,5):
    for j in range(i):
        if i%2==0:
            print("*",end=" ")

        else:
            print("#",end=" ")

    print()
```

```
#
* *
# # #
* * * *
```

In [5]:
```python
num=int(input("enter how many rows"))
for i in range(1,num+1):
    for k in range(1,num-i+1):
        print(end=" ")
    for j in range(1,i+1):
        print("*",end=" ")
    print()
```

```
enter how many rows5
    *
   * *
  * * *
 * * * *
* * * * *
```

In [6]:
```python
num=int(input("enter how many rows"))
for i in range(1,num+1):
    s=1
    d=65
    for k in range(1,num-i+1):
        print(end=" ")
    for j in range(1,i+1):
        if i%2==0:
            print(chr(d),end=" ")
        else:
            print(s,end=" ")
            s+=1
    print()
```

```
enter how many rows5
    1
   A A
  1 2 3
 A A A A
1 2 3 4 5
```

In [7]:
```python
num=int(input("enter how many rows"))
for i in range(1,num+1):
    for k in range(i):
        print(" ",end=" ")
    for j in range(i,num+1):
        print(" ",j,end=" ")
    print()

```

```
enter how many rows5
    1    2    3    4    5
      2    3    4    5
        3    4    5
          4    5
            5
```

In [8]:
```python
for i in range(1,11):
    for k in range(11,i,-1):
        print(" ",end=' ')
    for j in range(10,10-i,-1):
        print(" ",j,end=" ")
    print()
```

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

In [9]:
```python
num=int(input("enter how many rows"))
for i in range(1,num+1):
    for k in range(i):
        print(" ",end=" ")
    for j in range(i,num+1):
        print(" ",j,end=" ")
    print()
for i in range(2,11):
    for k in range(11,i,-1):
        print(" ",end=' ')
    for j in range(10,10-i,-1):
        print(" ",j,end=" ")
    print()
```

```
enter how many rows10
   1   2   3   4   5   6   7   8   9   10
      2   3   4   5   6   7   8   9   10
         3   4   5   6   7   8   9   10
            4   5   6   7   8   9   10
               5   6   7   8   9   10
                  6   7   8   9   10
                     7   8   9   10
                        8   9   10
                           9   10
                              10
                           10   9
                        10   9   8
                     10   9   8   7
                  10   9   8   7   6
               10   9   8   7   6   5
            10   9   8   7   6   5   4
         10   9   8   7   6   5   4   3
      10   9   8   7   6   5   4   3   2
   10   9   8   7   6   5   4   3   2   1
```

In [10]:
```python
for i in range(5):
    for j in range(9):
        if(i==0 and j==4)or(i==1 and(j==3 or j==5))or(i==2 and (2<=j<=6))o
            print("*",end=" ")
        else:
            print(" ",end=" ")
    print()
```

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

In [11]:
```python
for i in range(5):
    for j in range(5):
        if(i==0 and j==0)or(i==1 and j==1)or(i==2 and j==2)or(i==3 and j==
            print("$",end=" ")
        elif(i==0 and(1<=j<=4))or(i==1 and (j==0 or j==4)) or(i==2 and (j=
            print("*",end=" ")
        else:
            print(" ",end=" ")
    print()
```

```
$ * * * *
* $     *
*   $   *
*     $ *
* * * * $
```

In [12]:
```python
for i in range(5):
    for j in range(5):
        if(i==0 and j==0)or(i==1 and j==1)or(i==2 and j==2)or(i==3 and j==
            print("\\",end=" ")
        elif(i==0 and(1<=j<=4))or(i==1 and (j==0 or j==4)) or(i==2 and (j=
            print("*",end=" ")
        else:
            print(" ",end=" ")
    print()
```

```
\ * * * *
* \     *
*   \   *
*     \ *
* * * * \
```

strong number

ex:145

1!=1 4!=24 5!120 1+24+120=145

In [15]:
```python
for i in range (1,301):
    sum=0
    temp=i
    while(temp>0):
        mul=1
        l=temp%10
        for j in range(1,l+1):
            mul=mul*j
        temp//=10
        sum+=mul
    if(sum==i):
        print(i)
```

```
1
2
145
```

In [27]:
```python
## tribonaci number
def tribo(n):
    p3=0
    p2=0
    p1=1
    print(p3,p2,p1,end=" ")
    for i in range(4,n+1):
        cur=p1+p2+p3
        print(cur,end=" ")
        p3=p2
        p2=p1
        p1=cur
tribo(20)
```

```
0 0 1 1 2 4 7 13 24 44 81 149 274 504 927 1705 3136 5768 10609 19513
```

In [ ]:
```python

```