```
In [1]:
          1
             for i in range (4):
          2
                 for j in range (i+1):
                     print("*",end="'")
          3
          4
                 print()
In [2]:
          1
             k=65
          2
             for i in range (4):
          3
                 for j in range (i+1):
                     print(chr(k),end=" ")
          4
          5
          6
                 print()
        Α
        ВС
        DEF
        GHIJ
In [3]:
          1
          2
             for i in range (4):
          3
                 k=65
          4
                 for j in range (i+1):
                     print(chr(k),end=" ")
          5
          6
                     k+=1
          7
                 print()
        Α
        ΑВ
        ABC
        ABCD
In [4]:
             for i in range(1,5):
          1
          2
                 for j in range(i):
          3
                     if i%2==0:
                         print("*",end=" ")
          4
          5
                     else:
          6
                         print("#",end=" ")
          7
          8
          9
                 print()
```

```
num=int(input("enter how many rows"))
In [5]:
           2
              for i in range(1,num+1):
                  for k in range(1,num-i+1):
           3
                      print(end=" ")
           4
                  for j in range(1,i+1):
           5
                      print("*",end=" ")
           6
           7
                  print()
         enter how many rows5
In [6]:
              num=int(input("enter how many rows"))
              for i in range(1,num+1):
           2
           3
                  s=1
           4
                  d = 65
           5
                  for k in range(1,num-i+1):
           6
                      print(end=" ")
           7
                  for j in range(1,i+1):
           8
                      if i%2==0:
                           print(chr(d),end=" ")
           9
          10
                      else:
                           print(s,end=" ")
          11
          12
                           s+=1
          13
                  print()
         enter how many rows5
             1
            АА
           1 2 3
          \mathsf{A}\ \mathsf{A}\ \mathsf{A}\ \mathsf{A}
         1 2 3 4 5
In [7]:
              num=int(input("enter how many rows"))
           2
              for i in range(1,num+1):
           3
                  for k in range(i):
                      print(" ",end=" ")
           4
           5
                  for j in range(i,num+1):
                      print(" ",j,end=" ")
           6
           7
                  print()
           8
         enter how many rows5
             1
                  2
                      3
                          4
                    3 4
                            5
                2
                  3
                      4
                          5
                        5
                    4
                      5
```

```
In [8]:
             for i in range(1,11):
          2
                 for k in range(11,i,-1):
          3
                     print(" ",end=' ')
          4
                 for j in range(10,10-i,-1):
                     print(" ",j,end=" ")
          5
          6
                 print()
                               10
                             10
                                  9
                           10
                                9
                         10
                              9
                                  8
                                      7
                                8
                             8
                                  7
                                       6
                        9
                            8
                                7
                                        5
                 10
                      9
                          8
                              7
                                       5
                                  6
                    9
                        8
                            7
                                    5
               10
                                6
                                             3
                                                 2
                              6
                                  5
                                          3
                                               2
             num=int(input("enter how many rows"))
In [9]:
          2
             for i in range(1,num+1):
          3
                 for k in range(i):
          4
                     print(" ",end=" ")
          5
                 for j in range(i,num+1):
          6
                     print(" ",j,end=" ")
          7
                 print()
          8
             for i in range(2,11):
          9
                 for k in range(11,i,-1):
                     print(" ",end=' ')
         10
         11
                 for j in range(10,10-i,-1):
                     print(" ",j,end=" ")
         12
         13
                 print()
        enter how many rows10
                 2
                     3
                         4
                             5
                                 6
                                     7
                                         8
                                                  10
                           5
                               6
                                   7
                                              10
                                       8
                                 7
                             6
                                     8
                                         9
                                              10
                       5
                           6
                               7
                                   8
                             7
                                 8
                                     9
                         6
                           7
                               8
                                   9
                                       10
                         7
                                 9
                             8
                                     10
                               9
                                   10
                                 10
                               10
                             10
                                9
                           10
                         10 9
                                  8
                                      7
                       10
                            9
                                8
                                    7
                          9
                                      6
                        9
                                7
                                        5
                   10
                            8
                              7
                                      5
                 10
                          8
                                  6
                                          4
                                    5
               10 9
                        8
                            7
                                6
                                            3
            10
                         7
                              6
                                  5
                                      4
                                               2
                9
                      8
                                          3
```

```
In [10]:
                                                   1
                                                               for i in range(5):
                                                   2
                                                                                 for j in range(9):
                                                   3
                                                                                                    if(i=0) and j=4)or(i=1) and (j=3) or j=5)or(i=2) and (2<-j<-6)or(i=3)
                                                   4
                                                                                                                       print("*",end=" ")
                                                   5
                                                                                                    else:
                                                                                                                       print(" ",end=" ")
                                                   6
                                                                                 print()
In [11]:
                                                               for i in range(5):
                                                   1
                                                   2
                                                                                  for j in range(5):
                                                   3
                                                                                                    if(i=0) and j=0)or(i=1) and j=1)or(i=2) and j=2)or(i=3) and j=3
                                                                                                                       print("$",end=" ")
                                                   4
                                                   5
                                                                                                    elif(i=0 and(1 <= j <= 4))or(i==1 and (j==0 or j==4)) or(i==2 and (j==0)
                                                                                                                       print("*",end=" ")
                                                   6
                                                   7
                                                                                                    else:
                                                                                                                       print(" ",end=" ")
                                                   8
                                                   9
                                                                                 print()
                                           $
                                                    $
In [12]:
                                                               for i in range(5):
                                                   1
                                                   2
                                                                                  for j in range(5):
                                                                                                    if(i=0 \text{ and } j=0)or(i=1 \text{ and } j=1)or(i=2 \text{ and } j=2)or(i=3 \text{ and } j=2)or(i=3 \text{ and } j=3)or(i=3 \text{ and } j=3)or(i
                                                   3
                                                   4
                                                                                                                       print("\\",end=" ")
                                                   5
                                                                                                    elif(i=0 \text{ and}(1<=j<=4)) \text{ or}(i==1 \text{ and } (j==0 \text{ or } j==4)) \text{ or}(i==2 \text{ and } (j==0 \text{ or } j==4))
                                                                                                                       print("*",end=" ")
                                                   6
                                                   7
                                                                                                    else:
                                                                                                                       print(" ",end=" ")
                                                   8
                                                   9
                                                                                 print()
```

strong number

```
ex:145
1!=1 4!=24 5!120 1+24+120=145
```

```
In [15]:
              for i in range (1,301):
           1
           2
                   sum=0
           3
                  temp=i
           4
                  while(temp>0):
           5
                       mul=1
           6
                       l=temp%10
           7
                       for j in range(1,1+1):
           8
                           mul=mul*j
           9
                       temp//=10
          10
                       sum+=mul
          11
                  if(sum==i):
          12
                       print(i)
          1
          2
          145
In [27]:
              ## tribonaci number
           1
           2
              def tribo(n):
           3
                  p3=0
           4
                  p2=0
           5
                  p1=1
                  print(p3,p2,p1,end=" ")
           6
           7
                  for i in range(4,n+1):
           8
                       cur=p1+p2+p3
           9
                       print(cur,end=" ")
          10
                       p3=p2
          11
                       p2=p1
          12
                       p1=cur
```

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

```
In [ ]: 1
```

13 tribo(20)