Inverted Pattern

inverted Triangle

n = 4

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

```
Here,
1) N = 4 (ROW)
2) EACH ROW HAVE (N-I+1) COLUMN.MEANS FIRST ROW HAVE (4-1+1)= 4
COLUMNS, SECOND ROW HAS 3 COLUMNS.SO ON ...
3) PRINT '*'
```

METHOD 1

In [6]:

```python
n = int(input())
i = 1
while(i <= n):
    j = 1
    while(j <= n-i+1):
        print('*', end='')
        j = j + 1
    print()
    i = i + 1
```

```
4
****
***
**
*
```

METHOD 2

In [7]:

```python
n = int(input())
i = n
while(i > 0):
    j = 1
    while(j <= i):
        print('*', end='')
        j = j + 1
    print()
    i = i - 1
```
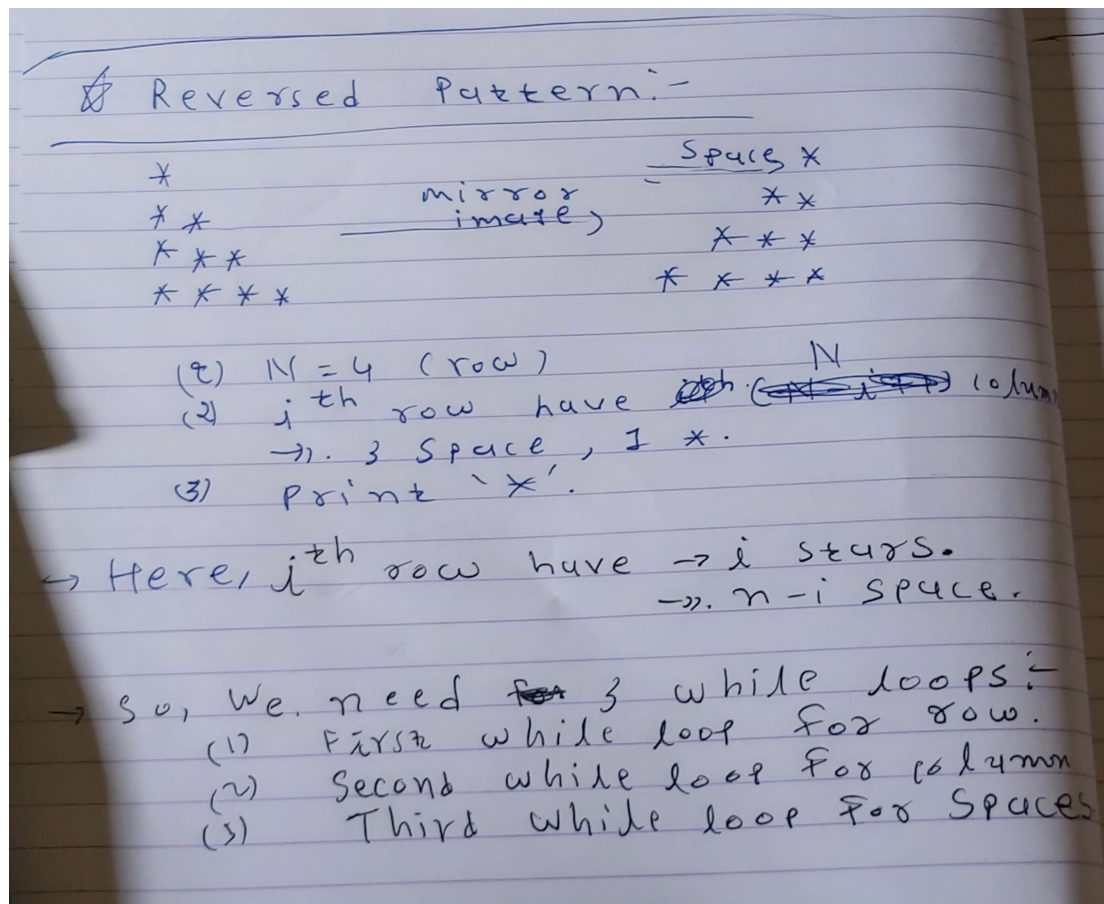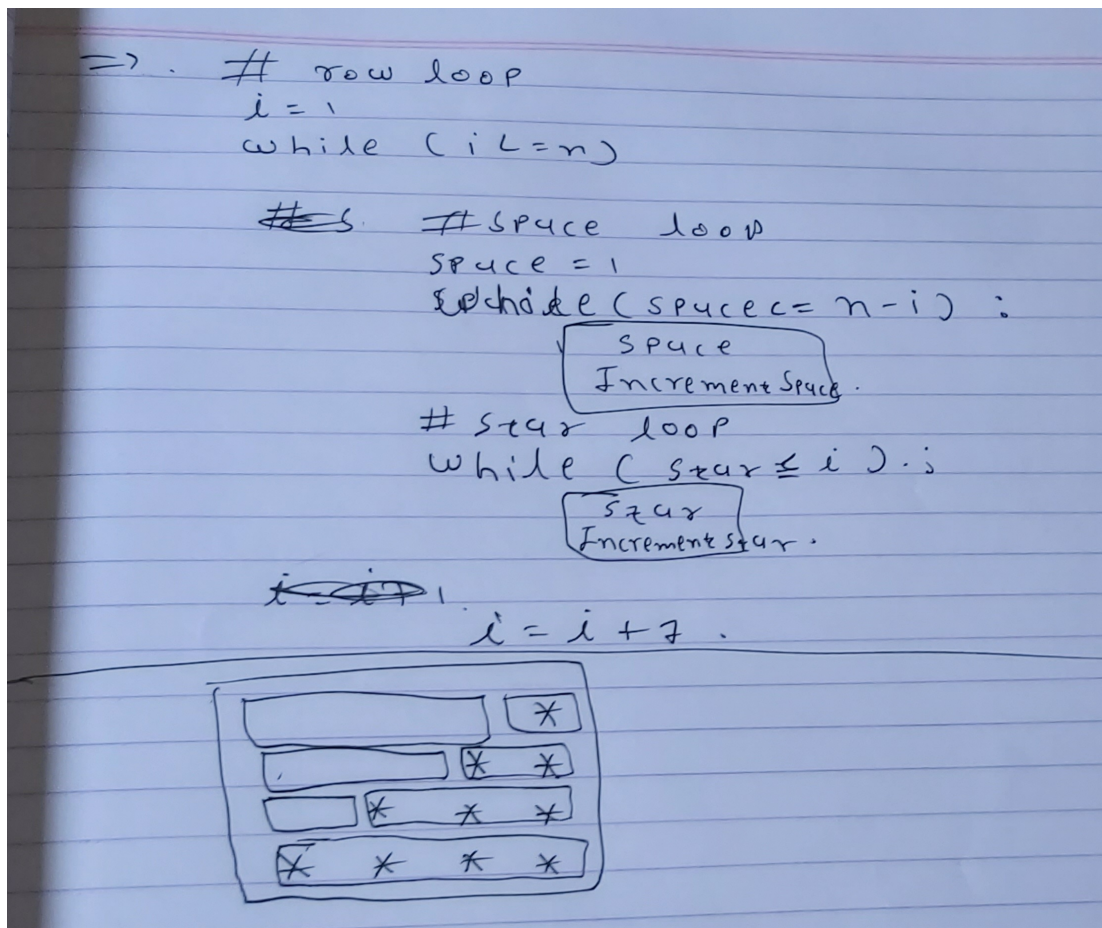
4
****
***
**
*

Reversed Pattern

In [10]:

```python
n = int(input())
#row loop
i = 1
while(i <= n):
    # space loop
    space = 1
    while(space <= n-i):
        print(' ',end="")
        space = space + 1

    # star loop
    star = 1
    while(star<=i):
        print('*',end="")
        star = star + 1

    print()
    i = i + 1
```

```
4
   *
  **
 ***
****
```

Isosceles Pattern

✷ Split the Problem into different parts.

✷ Isoceles Pattern :-

```
        spaces 1
             1  2  1
        1    2  3  2  1
   1  2    3  4  3  2  1
```
Number Increase   Number Decrease.

Here, (1) N = 4, 4 rows
     (2) each row have different number.

→ we divide whole problem in 3 parts
     (1) Spaces.
     (2) Increasing number
     (3) Decreasing Number.

—. we don't need to add space at end.

(2) First done → 1
```
                   1  2
                   1  2  3
                   1  2  3  4
```

(3) Then Add decreasing Number.
```
   →        1
          1  2|1
        1  2  3|2 1
      1  2  3  4|3 2 1
```

→ Decreasing sequence start from i-1, because first row doesn't have decreasing sequence, and goes till 1.

Part-1

　　　1
　　1 2
　1 2 3
1 2 3 4

```
# row loop
i = 1
while(i <= num)
    ┌─────────────────────┐
    │ space loop          │
    │ space               │
    │ while(space <= n-i) │
    │   print(space)      │
    │   space = space+1 . │
    └─────────────────────┘
    ┌─────────────────────┐
    │ Increasing loop     │
    │ j, k = 1 , 1        │
    │ while(j <= i)       │
    │   print(k, end=' ') │
    │   k = k+1           │
    │   j = j+1 .         │
    └─────────────────────┘
```

Part -2

　　　1
　　1 2 1
　1 2 3 1 1
1 2 3 4 3 2 1

Decreasing
Sequence .

→ Decreasing sequence is start
from i-1, because first
row Doesn't have decreasing
sequence.

→ we run this pattern
till 1, start from i-1.

```
┌────────────────────────────┐
│  # Decreasing sequence     │
│  P = i-1                   │
│  while (P >= 1)            │
│    ● print(P, end=' ')     │
│      P = P-1 .             │
└────────────────────────────┘
```

For i = 2,　　P = 1 ,　=>　1
　　　i = 3,　　P = 2 ,　=>(1)2
　　　　　　　　　　　　　　(2) 1 .

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

In [15]:

```python
n = int(input())
#row loop
i = 1
while(i <= n):
    # space loop
    space = 1
    while(space <= n-i):
        print(' ',end="")
        space = space + 1

    k = 1
    j = 1

    # increasing sequence
    while(j<=i):
        print(k,end="")
        j = j + 1
        k = k + 1

    # decreasing sequence,start from i-1
    p = i-1
    while(p>=1):
        print(p,end="")
        p =  p - 1

    print()
    i = i + 1
```

```
4
   1
  121
 12321
1234321
```

In [16]:

```python
# spaced version
n = int(input())
#row loop
i = 1
while(i <= n):
    # space loop
    space = 1
    while(space <= n-i):
        print(' ',end="")
        space = space + 1

    k = 1
    j = 1

    # increasing sequence
    while(j<=i):
        print(k,end=" ")
        j = j + 1
        k = k + 1

    # decreasing sequence,start from i-1
    p = i-1
    while(p>=1):
        print(p,end=" ")
        p =  p - 1

    print()
    i = i + 1
```

```
4
   1
  1 2 1
 1 2 3 2 1
1 2 3 4 3 2 1
```

In [ ]: