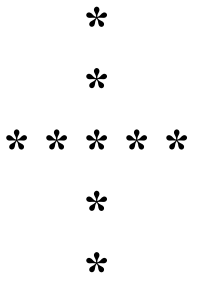
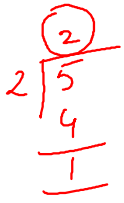
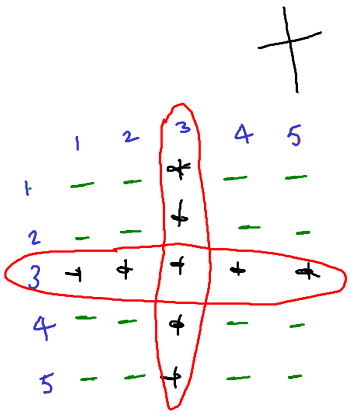
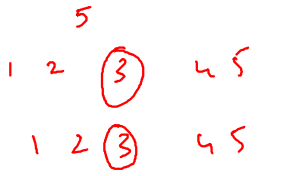
Advance Pattern Printing Problems

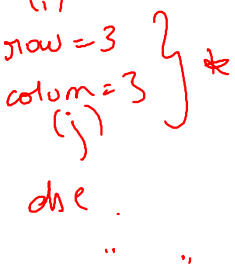
Pattern1 : Plus Pattern Printer

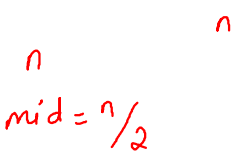


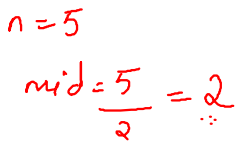


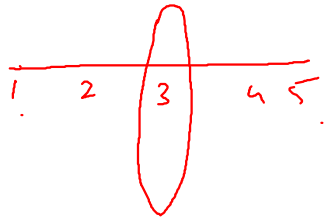


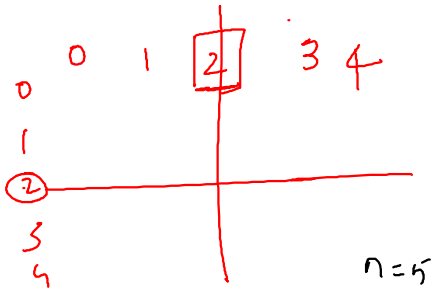












```
int mid=n/2;
for(int i=0;i<n;i++){
    for(int j=0;j<n;j++){
        if(i==mid || j==mid){
            cout<<"*";
        }else{
            cout<<" ";
        }
    }
    cout<<endl;
}
```

n=5

mid=2

i=0

j=0 0==2 ||0==2 ✗

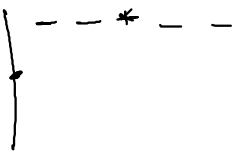
j=1 0==2||1==2 ✗

j=2 0==2||2==2 ✓

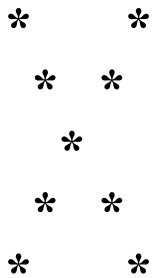
j=3 0==2||3==2 ✗

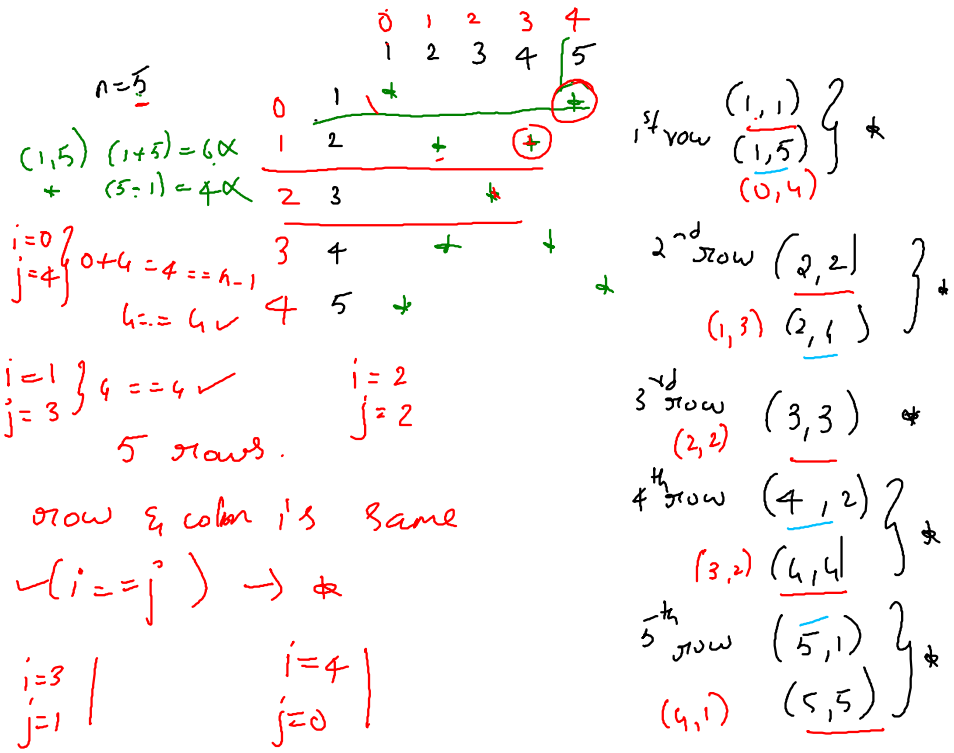
j=4

j=5 5<5 ✗



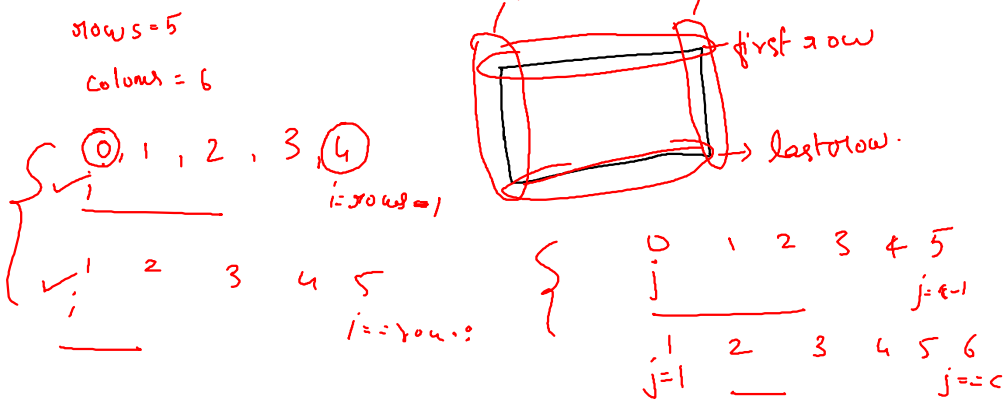
Pattern2 : Cross Star



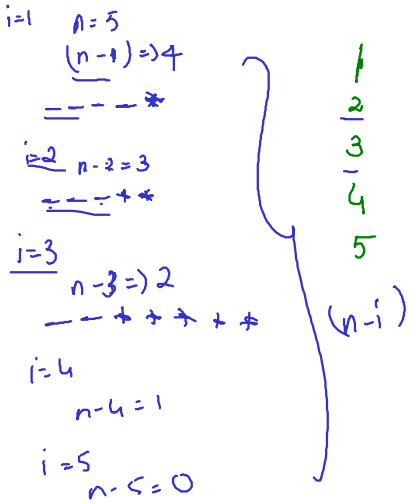


Pattern3: Hallow Rectangle

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



Pattern4: Centered Pyramid Star Pattern



i=1 (2x1-1) => (2x1-1) => 1
i=2 (2x2-1) => 4-1 => 3
i=3 (2x3-1) => 6-1 => 5
i=4 (2x4-1) = 8-1 => 7
...

1, 3, 5, 7, 9...
odd number
AP

AP: a+(n-1)d
=> 1+(n-1)2
=> 1+2n-2
a_n => 2n-1 //

Homework- Pattern5: Centered Inverted Pyramid Star Pattern

Pattern6: Hollow Pyramid Star Pattern

n=4

(n-1)=3

(n-1)

spaces → 1st loop

i=4, n=4

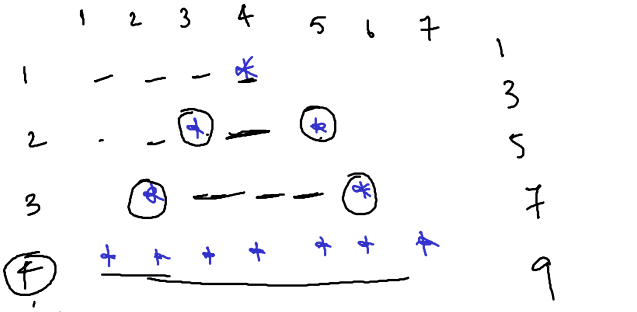
2nd loop

starting
ending

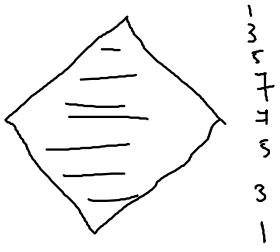
i=4

(j==1 || j==2*i-1 || i==n)

else



Pattern7: Full Diamond Star Pattern

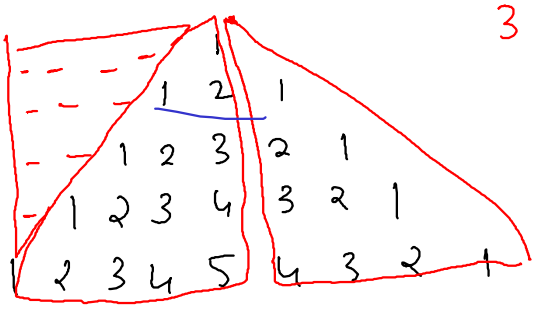


1 3 5 7 9 7 5 3 1

Similar to pattern 4.

pattern 5 H/W

Pattern8: Number Pyramid



3 triangle.

1st triangle - spaces

2nd triangle - numbers

3rd triangle - number

2nd triangle

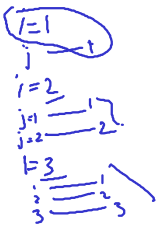
1

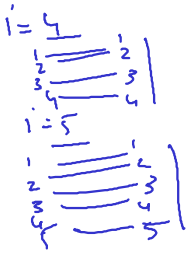
1 2

1 2 3

1 2 3 4

1 2 3 4 5





(j)

(j <= i)

i = 1

j = 0 -> i - 1

j >= 0

(j)

1

2 1

3 2 1

4 3 2 1

i = 2

j -> 2 - 1 -> 1

i >= 0

i = 3

j = 2

1

0

2 >= 0

1 >= 0

0 >= 0

i = 4

3

2

1

i = 5

4

3

2

1

Pattern9: Continuous Number Pyramid

spaces triangle

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

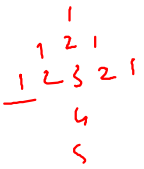
```
-1
-2
-3
-4
```

j<=i

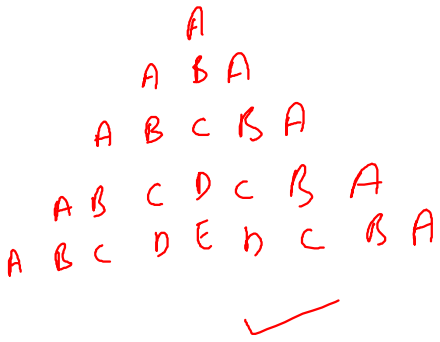
num=1

num++

Homework- Pattern10: Alphabet Pyramid



similar to pattern 8



Homework - Pattern11: Continuous Alphabet Pyramid

similar pattern 9