

# prime or not?  $\Rightarrow$  count of factors = 2

```
int count = 0;
```

```
for (int i = 1; i <= N; i++)
```

```
{
    if (N % i == 0)
```

```
    count++;
```

```
    }
```

```
    if (count > 2)
```

```
    {
        break;
    }
```

```
}
```

```
if (count == 2)
```

```
    print("prime");
```

```
else
```

```
    print("not a prime");
```

break;

↓  
come out of  
the nearest  
loop

↓  
any kind of  
loop

24

1 c = 1

2 c = 2

3 c = 3

4 c = 4

5

...

24

c = 8

# Given a positive integer N:

N=3      \* \* \*

N=5      \* \* \* \* \*

N=4      \* \* \* \*

# we need to  
print '\*' n times

$i = n-1$   
 $i = 0; i < n; i++$   
 for ( int  $i = 1; i \leq n; i++$  )  
 {  
   SOP( "\*" );  
   ~~println~~  
 }

n times  
 1  $\rightarrow$  n  
 0  $\rightarrow$  n-1  
 } = use case

~~N/0~~

o (N), print a square of '\*' (N\*N)

(N=3)

\* \* \*  
 \* \* \*  
 \* \* \*

N=4

\* \* \* \*  
 \* \* \* \*  
 \* \* \* \*  
 \* \* \* \*

for (      )  
 {  
   // some work  
 }

↓  
 for ( N )  
 {  
   // \* \* \* for (      )  
 }

```

for (j = 1; j <= N; j++)
{
    // *** ...
    for (i = 1; i <= N; i++)
    {
        sOP(" ");
    }
    system.out.println("");
}

```

N=3

```

* * *
* * *
* * *

```

```

j = 1    i = 1
          i = 2
          i = 3
          i = 4 X 4 < 3
j = 2    i = 1
          i = 2
          i = 3
          i = 4 X 4 < 3
j = 3    i = 1
          i = 2
          i = 3
          i = 4 X 4 < 3
j = 4    i = 1
          i = 2
          i = 3
          i = 4

```

\* Input N, M

N=3   M=4

1 → M

1 → N

```

* * * *
* * * *
* * * *

```

# rows = N  
# columns = M

rectangle  
N \* M

```

for (j = 1; j <= N; j++)
{
    // *** ...
    for (i = 1; i <= M; i++)
    {
        sOP(" ");
    }
    system.out.println("");
}

```

\*

input N

N=3

```

*
* *
* * *
  
```

N=5

i  $\rightarrow$  i no of # no of rows = N

1	*	1
2	* *	2
3	* * *	3
4	* * * *	4
5	* * * * *	5

```

for ( i=1; i<=N; i++)
{
  
```

```

    for ( j=1; j<=i; j++)
    {
  
```

```

        cout<<"*";
    
```

```

    }
  
```

```

    cout<<endl;
}
  
```

```

}
  
```

i row  
1-i

i=1 j=1 \*

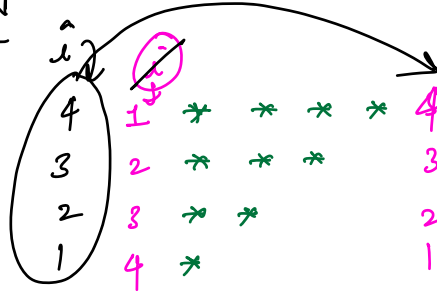
i=2 j=1 \*  
j=2 \*

i=3 j=1 \*  
j=2 \*  
j=3 \*  
j=4 X

0

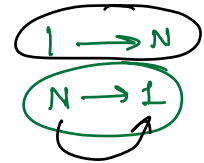
input = N

N=4



# rows? = (N)

N=5



for ( int i=N; i>=1; i-- )

for ( int j=1 ; j<=i ; j++ )

sop( \* );

sopln();

}

N=4

i=4 j=1 \*\*\*\*  
j=2  
j=3  
j=4  
5  
i=3 j=1 \*\*\*  
j=2  
j=3

10:35

How rather than chang<sup>g</sup> first loop,  
try to change internal loop

no

input N

N=5

```

*
* 2
* 2 *
* 2 * 4
* 2 * 4 *

```

N=6

```

*
* 2
* 2 *
* 2 * 4
* 2 * 4 *
* 2 * 4 * 6

```

	1	2	3	4	5	6	7	8	
1	*								1
2	*	2							2
3	*	2	*						3
4	*	2	*	4					4
5	*	2	*	4	*				5
6	*	2	*	4	*	6			6
7	*	2	*	4	*	6	*		7
8	*	2	*	4	*	6	*	8	8

# no of rows = N

H.W

```

1
1 *
1 * 3
1 * 3 *

```

```

for ( i=1; i<=N; i++)
{

```

```

    for ( j=1; j<=i; j++)
    {

```

```

        if ( j % 2 == 0 )
            sop(j);
        else { sop('*'); }
    }

```

```

}
sopln();
}

```

}

#  $N=8$

1 2 3 4 5 6 7 8  $j$

odd  $\rightarrow (j+1)/2$

1  
1 \*  
1 \* 2  
1 \* 2 \*  
1 \* 2 \* 3  
1 \* 2 \* 3 \*  
1 \* 2 \* 3 \* 4  
1 \* 2 \* 3 \* 4 \*

$N=5$

1  
1 \*  
1 \* 2  
1 \* 2 \*  
1 \* 2 \* 3

$i=1$   $x=2$   
 $i=2$   $x=1$   
 $i=3$   $x=1$   
 $i=3$   $x=1$

```
for ( i=1; i<=N; i++)
{
    int x=1;
    for ( j=1; j<=i; j++)
    {
```

```
        if ( j%2==0)
        {
```

```
            sop('*');
```

```
        }
        else
```

```
        {
            sop(x); x=x+1;
        }
```

```
    }
}
```

$sop((j+1)/2);$

#

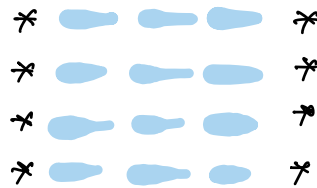
$N=3$



# no of rows =  $N$   
# start with \* and end with \*

# spaces  $\equiv N-1$

$N=4$



$N=4$       1-3

```
for( i=1; i<=N; i++)
{
```

```
    sop('*');
```

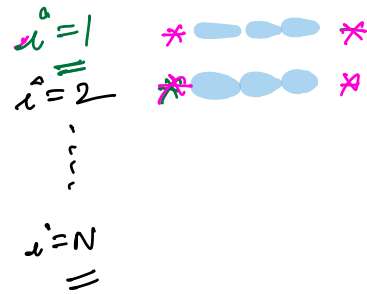
```
    for( j=1; j<=N-1; j++)
```

```
    {    sop(" ");
```

```
    }
```

```
    sop('*');
```

```
}
```





\*

$N=4$

```

*   *   *   *
*   *   *
*   *
*

```

$N=5$

```

1  *   *   *   *   *
2  *   *   *   *
3  *   *   *
4  *   *
5  *

```

4  
3  
2  
1  
0

$N-i$

5-1  
5-2  
5-3  
5-4  
5-5

# no of rows =  $n$

# 1 \* at start & 1 at end

# spaces in every row

$i$   
 $n-i$

```

for( i=1; i<=N; i++)
{

```

$N=5$

$SOP(*)$ ;

//  $N-i$  spaces

```

for( j=1; j<=N-i; j++)
{

```

$SOP(" ");$

$SOP(*)$ ;

$println(*)$

1 ✓

$N$  is even

no of test cases  $\rightarrow$