

Patterns

Ques) Given, n , Print $n!$

$N \approx 5$ * * * *

$N \approx 3$, * * *

for ($i=1; i \leq n; i++$) {
 $\text{pop}("x")$;
}

Ques 1 Given n , Print a Square of $n \times n$

$$N = 3$$
$$2 \approx 5$$

$n = 3$
~~3~~ 2 3
 for ($i = 1, i \leq n, i++$) {

for ($j=1; j \leq n; j++$) {
 doP("x", j);

→ $\text{pop}()'$; // go to next line

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Q3)

Given n, m , print a rectangle of $n \times m$

$n=2$
 $m=3$

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

$n=4$
 $m=5$

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

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

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

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

```
    }
```

```
    println();
```

```
}
```

Ques)

Given N as input, print staircase pattern

$N=3$

```
  *
 *
* * *
```

$N=5$,

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

$N=3$

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

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

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

```
    }
```

```
    println();
```

Ques 5) Given n print following pattern.

n=4

```

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

n=3

```

*
* 2
* 2 *
  
```

n=6

```

1 *
2 * 2
3 * 2 *
4 * 2 * 4
5 * 2 * 4 *
6 * 2 * 4 * 6
  
```

for (row = 1; row <= n; row++) {

for (col = 1; col <= row; col++) {

if (col % 2 == 0) {

print (col);

else {

print ("*");

print ln();

}

Ques) 6 Given n , print following pattern.

$N = 4$

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

$N = 3$

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

$N = 5$

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

$N = 6$

```
*  _  _  _  _  *
*  _  _  _  _  *
*  _  _  _  _  *
*  _  _  _  _  *
*  _  _  _  _  *
*  _  _  _  _  *
```

```
for (row = 1; row <= n; row++) {
```

```
    print ("*");
```

```
    for (sp = 1; sp <= n-2; sp++) {
```

```
        |  print (" ");
```

```
    print ("*");
```

```
    print("\n");
```

break

9:55 pm - 10:05 pm

Q7

Given n, print the following o/p.

N = 4

```

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

N = 3

```

* * *
* *
*
  
```

~ → hide

N = 4

```

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

Row

Star

N = 4

1	4	N+1
2	3	N+1
3	2	N+1
4	1	N+1

Row + Star = N+1

Star = N+1 - Row

= 4+1 - 2

⇒ 3

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

for (star = 1; star <= N+1 - row; star++) {

print ("* ");

println();

}

Ques)

Given n , print the following pattern,

$n = 4$

```
* - - - *
* - - *
* - *
* *
```

$n = 3$

```
* - - *
* - *
* *
```

$n = 4$

```
* - - - *
* - - *
* - *
* *
```

row

space

$n = 4$

1	3	2
2	2	2
3	1	2
4	0	2

$row + space = n$

$space = n - row$

for ($row = 1$; $row \leq n$; $row++$) {

 print (" * ");

 for ($col = 1$; $col \leq n - row$; $col++$) {

 print (" - ");

 print (" * ");

 print ("\n");

}

Q9

Given n , print following pattern.

$n = 3$

```

- - *
- * *
* * *
  
```

$n = 4$

```

- - - *
- - * *
- * * *
* * * *
  
```

$n = 5$

```

- - - - *
- - - * *
- - * * *
- * * * *
* * * * *
  
```

row space star

$n = 4$

1	3	1
2	2	2
3	1	3
4	0	4

→

star = row

space = $n - \text{row}$

space = $n - \text{row}$

for (row = 1; row ≤ n ; row++) {

for (sp = 1; sp ≤ $n - \text{row}$; sp++) {

print (" ");

for (st = 1; st ≤ row; st++) {

print ("*");

}

println();

}

row

```

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

Ques) Given n , print the following pattern.

$n=4$

```

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★ ★ - - - - ★ ★
★ - - - - - ★
  
```

$n=3$

```

★ ★ ★ ★ ★
★ ★ - - ★ ★
★ - - - ★
  
```

$n=4$

```

★ ★ ★ ★ ★ ★ ★
★ ★ ★ - - ★ ★ ★
★ ★ - - - - ★ ★
★ - - - - - ★
  
```

$n=4$

row	st1	sp	st2
1	4	0	4
2	3	2	3
3	2	4	2
4	1	6	1

$$st1 + row = n + 1$$

$$st1 = n + 1 - row$$

$$st1 = st2 \Rightarrow n + 1 - row$$

$$2 - row + 2$$


```
for (row = 1; row <= n; row++) {
```

```
    for (st = 1; st <= n + 1 - row; st++) {
```

```
        Print(" ");
```

```
        for (sp = 1; sp <= 2 * row - 2; sp++) {
```

```
            Print(" ");
```

```
        for (st = 1; st <= n + 1 - row; st++) {
```

```
            Print(" ");
```

```
        println();
```

Q11

Given n, Print pattern,

n = 4

```

- - - - *
- - - * * *
- * * * * *
* * * * * *
```

n = 3

```

- - *
- * *
* * * *
```

```

- - - - *
- - - * * *
- * * * * *
* * * * * *
```

Row	sp	st
1	3	1
2	2	2
3	1	3
4	0	4

Row + sp = n

sp = n - row

st = 2 * row - 1

ade \rightarrow H.V