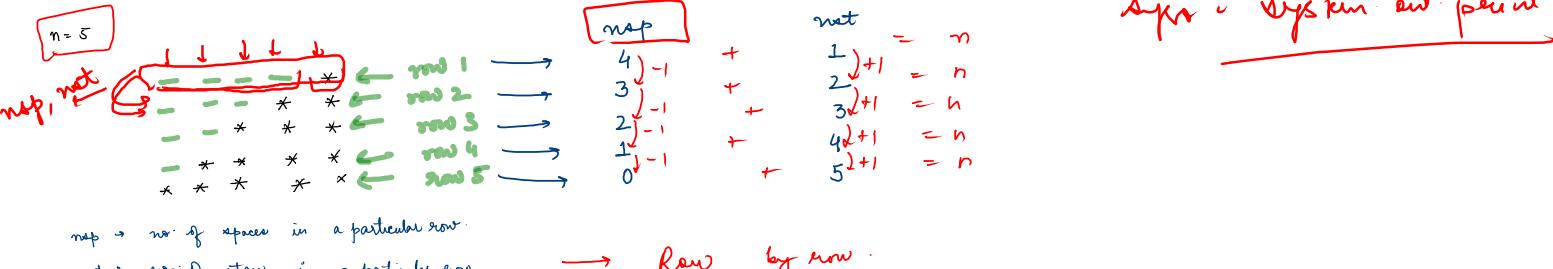


Notes , Coding Question Solution

Module -01

- ↳ Pointing in Java
- ↳ Operators,
- ↳ Loops
 - ↳ For
 - ↳ while
 - ↳ do-while
- ↳ Functions ↳ Number system



$$\text{map} = n-1; \quad \text{net} = 1$$

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

```
{   for (int j = 1; j <= map; j++)
    sysout(" "));
```

```
    for (int j = 1; j <= net; j++)
        sysout("*");
```

}

System out printing map--, net++,

```

public static void main(String[] args) {
    /* Enter your code here. Read input from STDIN. Print out
Scanner scn = new Scanner(System.in);
int n = scn.nextInt();
int nsp=n-1,nst=1;

for(int i=1;i<=n;i++){
    for(int j=1;j<=nsp;j++){
        System.out.print("\t");
    }
    for(int j=1;j<=nst;j++){
        System.out.print("*\t");
    }

    System.out.println();
    nsp--;
    nst++;
}

```

$$n = 5$$

$$\cancel{nsp = 4, 3} \quad \cancel{nst = 2, 3}$$

$$i = 1 \leftarrow 5 (T)$$

$$\overset{\circ}{j} = 1 \leftarrow 4 (T)$$

$$\overset{\circ}{j} = 2 \leftarrow 4 (T)$$

$$\overset{\circ}{j} = 3 \leftarrow 4 (T)$$

$$\overset{\circ}{j} = 4 \leftarrow 4 (T)$$

$$\overset{\circ}{j} = 5 \leftarrow 4 (F)$$

$$\overset{\circ}{j} = 1 \leftarrow 1 (T)$$

$$\overset{\circ}{i} = 2 \leftarrow 5 (T)$$

$$\hookrightarrow \overset{\circ}{j} = 1 \leftarrow 3 (T)$$

$$\hookrightarrow \overset{\circ}{j} = 2 \leftarrow 3 (T)$$

$$\hookrightarrow \overset{\circ}{j} = 3 \leftarrow 3 (T)$$

$$\hookrightarrow \overset{\circ}{j} = 4 \leftarrow 3 (F)$$

$$\overset{\circ}{j} = 1 \leftarrow 2 (T)$$

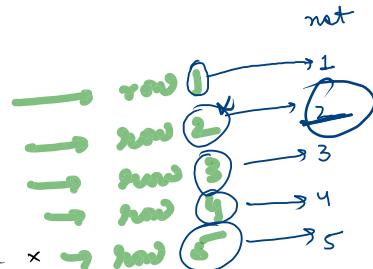
$$\overset{\circ}{j} = 2 \leftarrow 2 (T)$$

Sample Input 0

$n=5$

5

5
* *
* * *
* * * *
* * * * *
x x x x x



Sample Output 0

net
1
2 3
4 5
7 8 9 10
11 12 13 14 15

net

int num = 1;
for (int i = 1; i < n; i++)
{
 for (int j = 1; j < i; j++)
 {
 cout << num++;
 }
 if (num - out - println(>))

sum
in
no. of
time

```
1 import java.io.*;
2 import java.util.*;
3
4 public class Solution {
5
6     public static void main(String[] args) {
7         /* Enter your code here. Read input from STDIN. Print output to STDOUT */
8         Scanner scn = new Scanner(System.in);
9         int n = scn.nextInt();
10        int num = 1;
11        for(int i=1;i<=n;i++){
12            for(int j=1;j<=i;j++){
13                System.out.print(num + " ");
14                num++;
15            }
16            System.out.println();
17        }
18    }
19 }
```

```

public static void main(String[] args) {
    /* Enter your code here. Read input from STDIN. Print output */
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();
    int num = 1;
    for(int i=1; i<=n; i++){
        for(int j=1; j<=i; j++){
            System.out.print(num + " ");
            num++;
        }
        System.out.println();
    }
}

```

$n=5$

$i=1 \leftarrow 1 \text{ (T)}$

$j=1 \leftarrow 1 \text{ (T)}$

$j=2 \leftarrow 1 \text{ (F)}$

$i=2 \leftarrow 5 \text{ (T)}$

$j=1 \leftarrow 2 \text{ (T)}$

$j=2 \leftarrow 2 \text{ (T)}$

$j=3 \leftarrow 2 \text{ (F)}$

$*$
 $*$ $*$
 $*$ $*$ $*$
 $*$ $*$ $*$ $*$
 $i=3 \leftarrow 5 \text{ (T)}$

$num=2$
 $i=1 \leftarrow 5 \text{ (T)}$

$j=1 \leftarrow 1 \text{ (T)}$
 $j=2 \leftarrow 1 \text{ (F)}$

$i=2 \leftarrow 5 \text{ (T)}$
 ~~$num=2 \leftarrow 2 \text{ (T)}$~~ $\circlearrowleft 4$

$j=1 \leftarrow 2 \text{ (T)}$

$j=2 \leftarrow 2 \text{ (T)}$

$j=3 \leftarrow 2 \text{ (F)}$

$i=3 \leftarrow 5 \text{ (T)}$
 $num=4 \leftarrow 5$

$j=1 \leftarrow 3 \text{ (T)}$

1
 2 3
 4 5 6 7
 8 9 10
 6 11 12 13 14 15

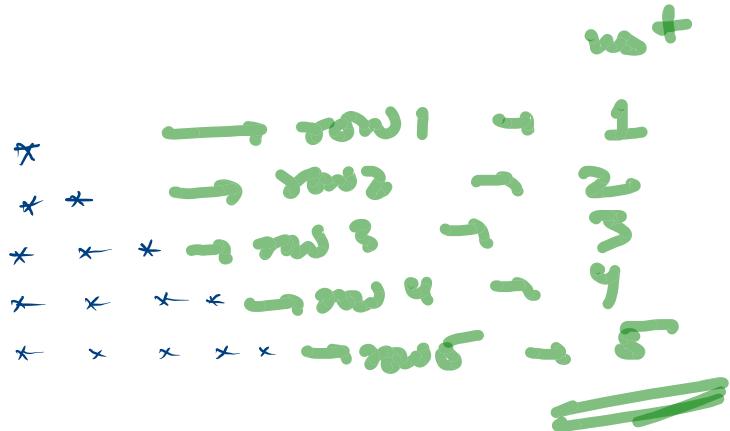
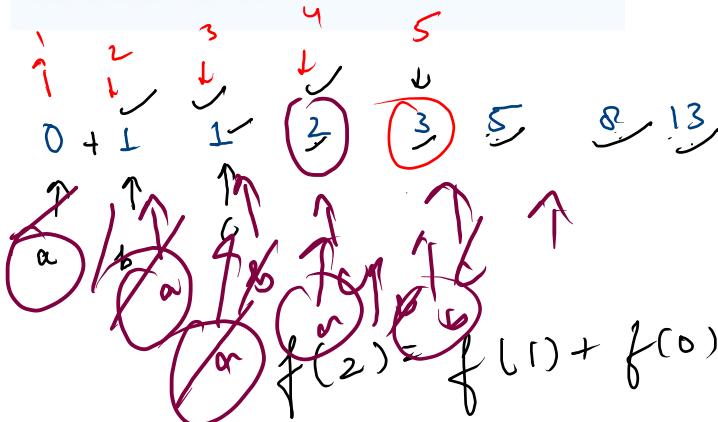
Sample Input 0

5

Sample Output 0

① a → 0

1 1
2 3 5
8 13 21 34
55 89 144 233 377



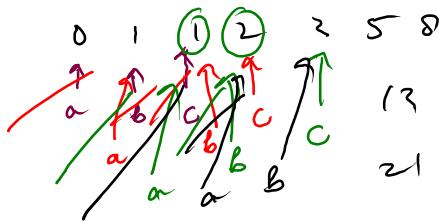
$$f(n) = f(n-1) + f(n-2)$$

$$\begin{aligned}f(5) &= f(4) + f(3) \\&= 2 + 1 \\&\text{③}\end{aligned}$$

```

int a=0, b=1;
for (int i=1; i<=n; i++) {
    for (int j=1; j<=i; j++) {

```



$i=1 \leftarrow 1$
 $j=1 \leftarrow 1(1)$

$i=2 \leftarrow 5(1)$

$j=1 \leftarrow 2(1)$
 $j=2 \leftarrow 2(1)$

System.out.println(" ");

int c = a+b

$a=\textcircled{b}$
 $b=\textcircled{c}$

System.out.println(c);

5

Pattern - 09

```
public class Solution {  
  
    public static void main(String[] args) {  
        /* Enter your code here. Read input from STDIN. Print output to  
        Scanner scn = new Scanner(System.in);  
        int n = scn.nextInt();  
        int a =0,b=1;  
  
        for(int i=1;i<=n;i++){  
            for(int j=1;j<=i;j++){  
                System.out.print(a + " ");  
                int c = a+b;  
                a=b;  
                b=c;  
            }  
            System.out.println();  
        }  
    }  
}
```

Sample Input 0

5

Sample Output 0

```
1      → 0  
1 1    → 1  
1 2 1  → 2  
1 3 3 1 → 3  
1 4 6 4 1 → 4
```

```
for (int i=0; i<n; i++) {  
    for (int j=0; j<=i; j++) {
```

}

?

$(i \rightarrow 1 c=5)$ | $(i \rightarrow 0 c=5)$

\downarrow

$1, 2, 3, 4, 5$

\downarrow

5 times

\downarrow

$0, 1, 2, 3, 4, 5$

\downarrow

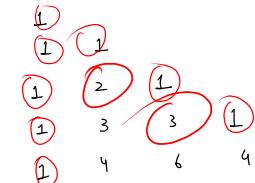
6 times

Sample Input 0

5

Sample Output 0

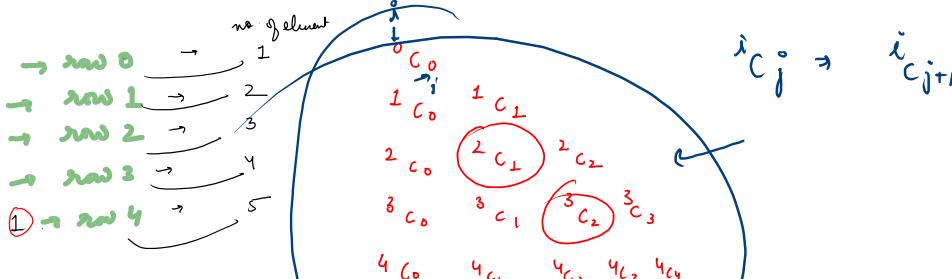
1	1			
1	2	1		
1	3	3	1	
1	4	6	4	1



$$n_{C_0} = n_{C_n} = 1 \Rightarrow$$

$$\frac{n!}{\cancel{0!}(n-0)!} = 1 \quad \left| \frac{n!}{\cancel{0!}(n-0)!} = 1 \right. = 1$$

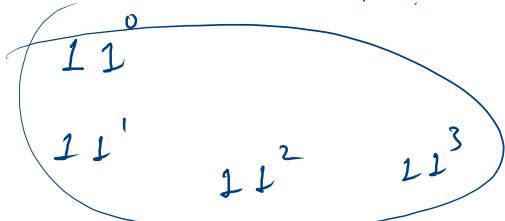
$$\boxed{\text{Val} = 1}$$



$$n_{C_r} = \frac{n!}{r!(n-r)!}$$

$$2_{C_1} = \frac{2!}{1!1!} = 2$$

$$3_{C_2} = \frac{3!}{2! * 1!} = 3$$



```

public static void main(String[] args) {
    /* Enter your code here. Read input from STDIN. Print output */
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();

    for(int i=0;i<n;i++){
        int val = 1;

        for(int j=0;j<=i;j++){
            System.out.print(val + " ");
            val = ((i-j)*val)/(j+1);
        }
        System.out.println();
    }
}

```

$$n = 5$$

$i = 0 \leq 5 \text{ (T)}$
~~val = 1 0~~
 $j = 0 \leq 0 \text{ (T)}$
 $j = 1 \leq 0 \text{ (F)}$
 $val = (0 - 0)$

$i = 1 \leq 5 \text{ (T)}$
~~val = 1 1~~
 $j = 0 \leq 1 \text{ (T)}$
 $val = ((1 - 0) * 1) / 1$
 $= 1 / 1 = 1$
 $j = 1 \leq 1 \text{ (T)}$
 $val = (1 - 1)$
 $j = 2 \leq 1 \text{ (F)}$

$i = 2 \leq 5 \text{ (T)}$
~~val = 1 2~~
 $j = 0 \leq 2 \text{ (T)}$
 $val = ((2 - 0) * 2) / (1 + 1)$
 $= 2 / 2 = 1$
 $j = 1 \leq 2 \text{ (T)}$
 $val = (2 - 1) - 0$

$i = 1 \leq 5 \text{ (T)}$
~~val = 1 1~~
 $j = 0 \leq 1 \text{ (T)}$
 $val = ((1 - 0) * 1) / 1$
 $= 1 / 1 = 1$
 $j = 1 \leq 1 \text{ (T)}$
 $val = (1 - 1)$
 $j = 2 \leq 1 \text{ (F)}$

$i = 2 \leq 5 \text{ (T)}$
~~val = 1 2~~
 $j = 0 \leq 2 \text{ (T)}$
 $val = ((2 - 0) * 2) / (1 + 1)$
 $\Rightarrow 2 / 2 = 1$

$j = 1 \leq 2 \text{ (T)}$
 $val = ((2 - 1) * 2) / (1 + 1)$
 $= 2 / 2 = 1$
 $j = 2 \leq 2 \text{ (T)}$
 $val = (2 - 2) - 0$

net

- 1) +2
- 3) +2
- 5) -2
- 3) -2
- 1) +1

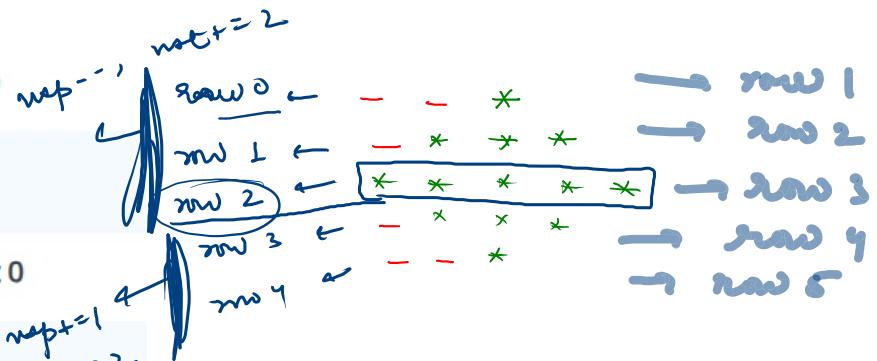
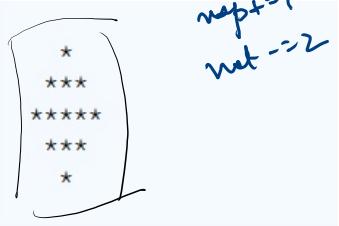
nep

- 2) -1
- 1) -1
- 0) +1
- 1) +1
- 2) +1

Sample Input 0

5

Sample Output 0



$$nep = \frac{n}{2} = \frac{5}{2} = 2$$

$$nep = 1$$

$$ic = \frac{q}{2}$$

$n = 7$

~~*****
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *~~

$nsp = 2$

```
import java.io.*;
import java.util.*;

public class Solution {

    public static void main(String[] args) {
        /* Enter your code here. Read input from STDIN. Print output to STDOUT */
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();
        int nsp = n/2, nst = 1;

        for(int i=0;i<n;i++){
            for(int j=1;j<=nsp;j++){
                System.out.print(" ");
            }

            for(int j = 1;j<=nst;j++){
                System.out.print("*");
            }

            if(i<n/2){
                nsp--;
                nst+=2;
            }else{
                nsp++;
                nst-=2;
            }

            System.out.println();
        }
    }
}
```

$$\frac{7}{2} = 3$$

~~7/2 = 3~~

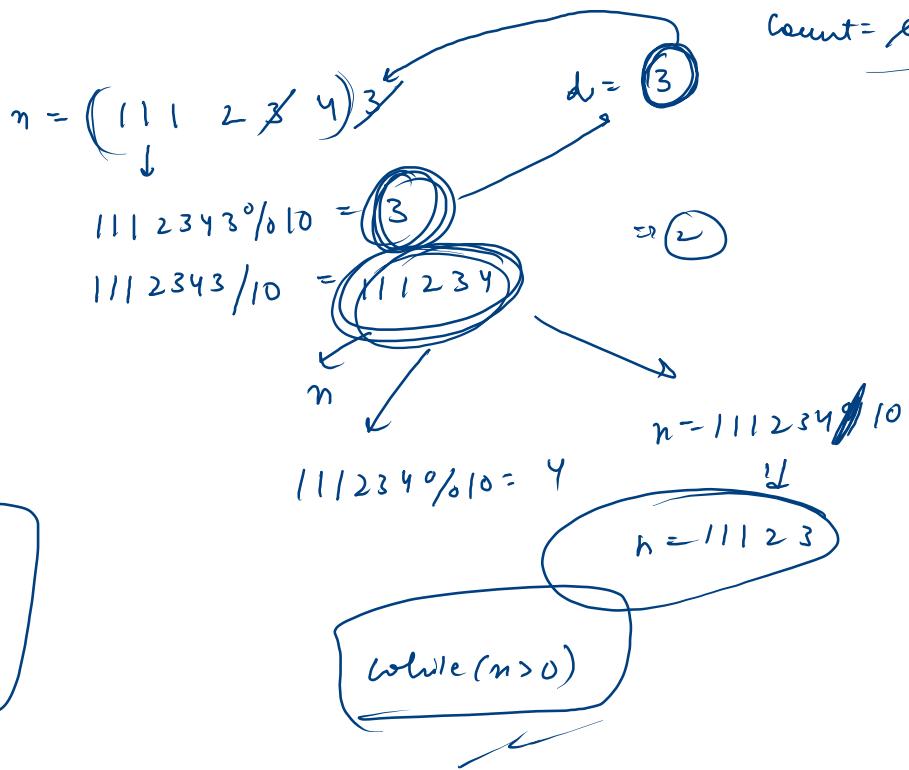
Sample Input 0

1112343
3

Sample Output 0

2

$\% \rightarrow$ remainder
 $/ \rightarrow$ quotient



$$n_{x+1} = \frac{n!}{(x+1)! (n-x-1)!} \Rightarrow \frac{n!}{(x+1)(x)! (n-x-1)!}$$

$$\Rightarrow \frac{n_{x+1}}{n_x} = \frac{(n-x)}{x+1}$$

$$n_x = \frac{n!}{x! (n-x)!} \Rightarrow \frac{n!}{x! (n-x) (n-x-1)!}$$

$$\Rightarrow n_{x+1} = \frac{(n-x)}{(x+1)} n_x$$

$$5! = 5 \times 4!$$

$$\frac{n_{x+1}}{n_x} = \frac{\cancel{n!}}{(x+1)\cancel{x!}(n-x-1)!} \quad \frac{n!}{\cancel{x!}(n-x)\cancel{(n-x-1)!}}$$

$$i_{j+1} = \frac{(i-j)}{(j+1)} \quad \overset{i}{\underset{j}{\circlearrowright}}$$

$$\begin{aligned} n &\rightarrow i \\ x &\rightarrow j \end{aligned}$$

$$val = \frac{(i-j)}{j+1} * val$$

→ Clean wall →

Time complexity + space