Week 1 LIVE

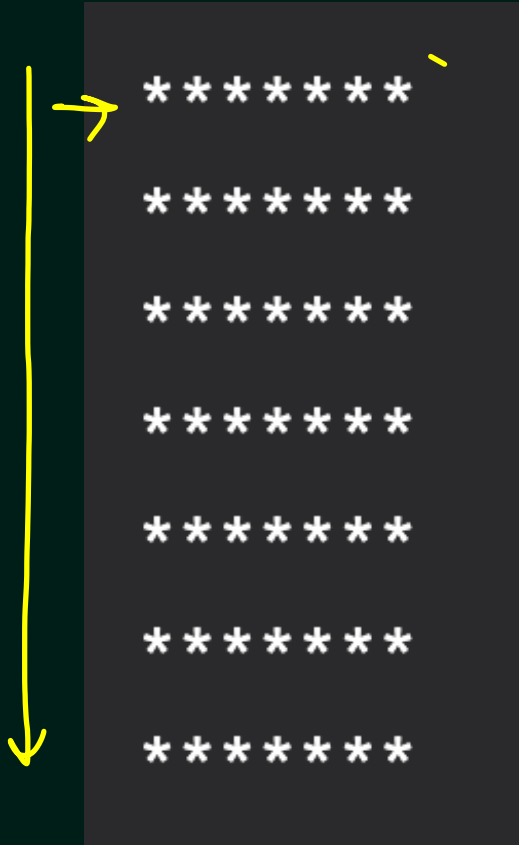# Nested Loops and Patterns

In This Lecture

1. Pattern Problems ✓
2. Common Doubts ✓
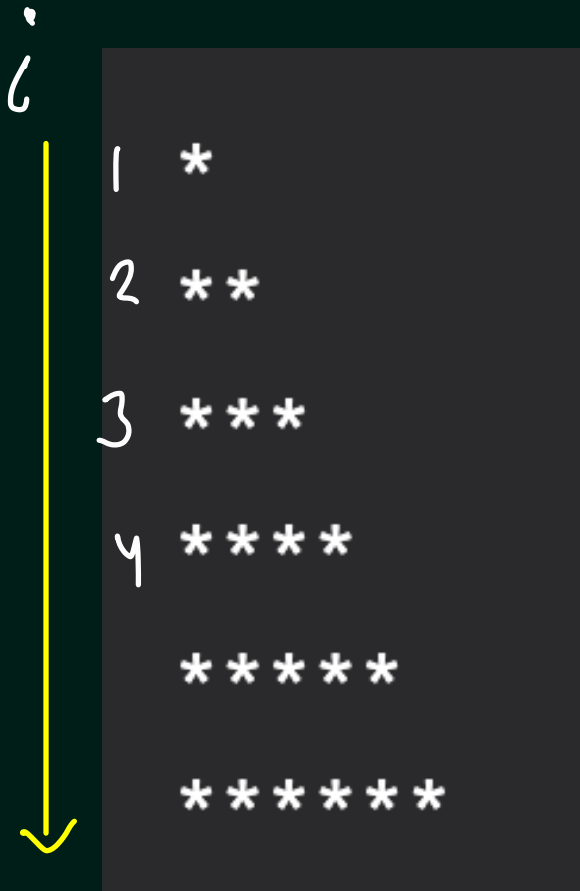
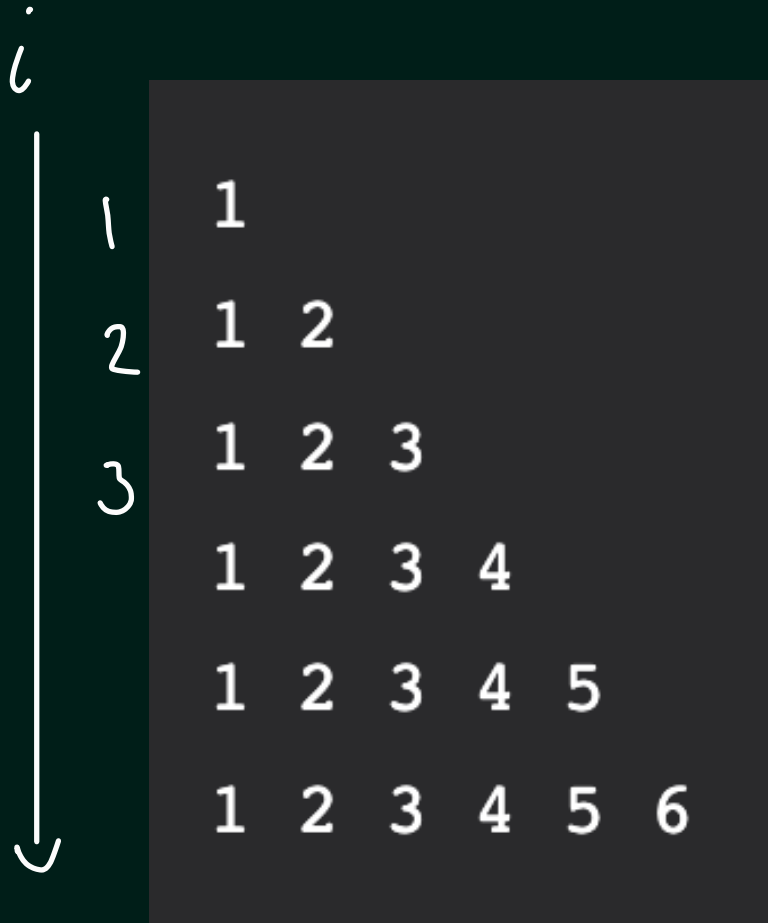# Patterns

1
2 loops
outr
inner

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

2

i

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

3

i

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

Patterns

4

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

5

```
i

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

6

n = 6

```
          *
      *  *
   ⊛*  *⊛
  ⊛*    *⊛
 ⊛*      *⊛
*          *
 *        *
  *      *
   *    *
    *  *
     *
```

$i = 0$

$2i - 1 = -1$

$i = 1$

$2i - 1 = \boxed{1}$

$j = 0$

$\begin{array}{|c|}\hline 1 \\ 2 \\ 3 \\ 4 \\\hline\end{array}$

$*$ $*$ $2*i-1$ 0 $\quad i \quad\quad i$

2 0 $*$ 1

$*$ 0 1 2 3 $*$ 2

$*$ 0 1 2 3 4 $*$ 3

$*$ 0 1 2 3 4 $*$ $i = 4$

0 1 2 3 4 5 6 7

$i = 0 \quad \boxed{2 * i - 1 \,.}$
$\cdots n$

$2*(i-1) - 1$

$2i - 2 - 1$

$i = 1 \;\longrightarrow\; \boxed{2i - 3} \quad i = 1 \cdots n$

$1 \rightarrow 0$

$2 \rightarrow 1$

$3 \rightarrow 3$

$4 \rightarrow 5$

Roll → 1
2
4
5

```
int i = 1;
while (i <= 5) {
    if (i == 3) continue;    i++;
    sout("toffe for" + i);
}
```

x →

⟶ 1
2
4
5

Patterns - Homework

7

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

8

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

9

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

10

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

Patterns - Homework

11

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

12

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

13

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

14

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

Patterns - Homework

11

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

12

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

13

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

14

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