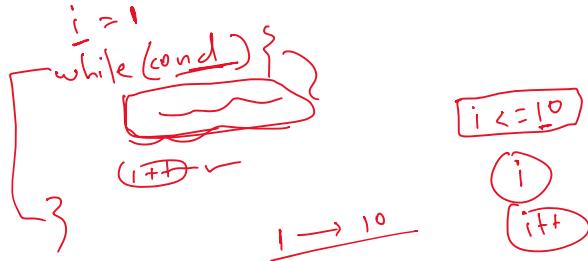


Loops

\hookrightarrow ① for

- ② while
- ③ do-while
- ④ forEach



```
int i = 1; //  
int n = 10;  
while (i <= n) {  
    System.out.println(i);  
    i++;  
}
```

$$i <= 10 \rightarrow 1$$

$$2 \leq 10 \rightarrow 2$$

$$\vdots$$

$$10 \leq 10 \rightarrow 10$$

$$\cancel{+} \boxed{11 \leq 10}$$

Ques 1:
 $n = 5$

identify \rightarrow type of task
 \hookrightarrow star

$n = 5$
 $\text{row} = 1 \ 2 \ 3 \ 4 \ 5 \leftarrow n$
 $\text{star} = n$

$\text{while } (\text{row} \leq n)$

// star
 $\text{int } i = 1;$
 $\text{while } (i \leq \text{star}) \{$
 $\quad \text{cout} ("*")$
 $\quad i++$
 $\}$
 $\text{row}++$
 $\text{cout} ()$

$$\begin{aligned} 1 &\leq 5 \\ 2 &\leq 5 \\ 3 &\leq 5 \\ 4 &\leq 5 \\ 5 &\leq 5 \\ 6 &\leq 5 \end{aligned}$$

Ques 2:
 $n = 5$

$$\text{row} = 1 \ 2 \ 3 \ 4 \ 5 \leftarrow n$$

$$\text{star} = 1 \ 2 \ 3 \ 4 \ 5 \leftarrow n$$

```
int n = 5;  
int star = 1;  
int row = 1; ✓  
while (row <= n) {  
    // Star  
    int i = 1;  
    while (i <= star) {  
        System.out.print("* ");  
        i++;  
    }  
    row++; star++;  
    // Next line prep  
    System.out.println();  
}
```

```

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

```

}

Ques 2:

n = 5

```

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

```

row = 1 star = 1

while(row <= n) {

```

    //star
    int i = 1
    while(i <= star) {
        cout (*)
        i++
    }

```

→ row++, star++
 //next line prep
 → cout()

3 n = 5 space = n-1 star = 1 2 3 4 5

row = 1 space = 4 3 2 1 star = 1 2 3 4 5

while(row <= n) {

```

    //space
    int i = 1
    while(i <= space) {
        cout (" ")
        i++
    }

```

```

    //star
    int j = 1
    while(j <= star) {
        cout (*)
        j++
    }

```

row++
 space--
 star++
 //next

Ques 4:

n = 5

```

    -----
    * *
    * * *
    * * * *
    * * * * *

```

→ - - - - *

