C, C++ and DSA in depth
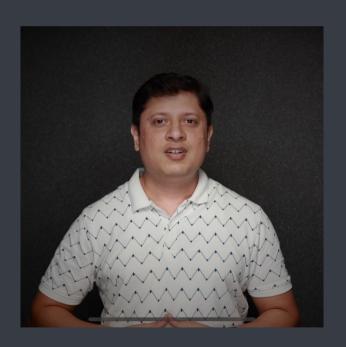
Star Pattern problems.

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Agenda

① Nested loop
② Basic skeleton code
③ Practic problem

Nested loop

```
while ( — )
{

        while (    )
        {



        }

            =

}
```

```
while ( — )
{

        =

    for ( ; ; )
    {
            =



    }

        =

}
```

Find the output of the following program

$$a \boxed{1} \quad b \boxed{6} \quad c \boxed{7}$$

```c
int main()
{
    int a,b,c;

    for(a=5 ; a>1 ; a--)
    {
        for (b= 6-a ; b<=5 ; b++)
        {
            c=a+b;
            printf("\n %d %d %d",a,b,c);
        }
    }
}
```

```
5 1 6      4 2 6    3 3 6   2 4 6
5 2 7      4 3 7    3 4 7   2 5 7
5 3 8      4 4 8    3 5 8
5 4 9      4 5 9
5 5 10
```

Find output

a
$\boxed{5}$

b
$\boxed{6}$

```c
int main()
{
    int a,b;
    for(a=1; a<=4; a++)
    {
        for(b=1; b<=5; b++)
        {   printf("%d ", b*a);
        }
        printf("\n");
    }
}
```

```
1 2 3 4 5
2 4 6 8 10
3 6 9 12 15
4 8 12 16 20
```

Basic Skeleton

①

j

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

i

②

i	j
1	1 2 3 4 5
2	1 2 3 4
3	1 2 3
4	1 2
5	1

③

i	j
1	j <= 5
2	j <= 4
3	j <= 3
4	j <= 2
5	j <= 1

④

$$j <= 6 - i$$