

A job ready bootcamp in C++, DSA and IOT

Star Pattern problems.



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Agenda

- ① Nested loop
- ② Basic skeleton code
- ③ Practice problem

Write a program to print first 10
odd natural numbers

1 3 5 7 9 11 13 15 17 19

```
int main()
{
    int i;
    for (i=1; i<=10 ; i++)
    {
        printf("%d", 2*i-1);
    }
}
```

Write a program to calculate
Sum of first N natural numbers.

```
int main()
{
    int n, s, i;
    printf("Enter a number");
    scanf("%d", &n);
    for(i=1, s=0; i<=n; i++)
        s = s + i;
    printf("Sum is %d", s);
}
```

$$1+2+3+4+5$$

$$\boxed{0}$$

$$S = S + 1$$

$$S = S + 2$$

$$S = S + 3$$

① Read

② Test Case

$$N = 5$$

$$\text{Sum} = 15$$

③ Dry run

Nested loop

while(—)

{

 while()

 {

 }

 =

 }

 while(—)

 {

 =

 for(; ;)

 {

 =

 }

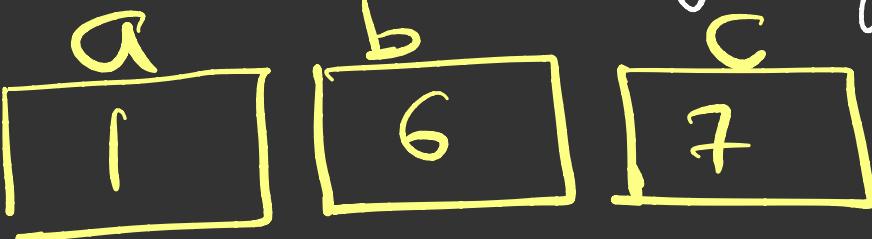
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 }

Find the output of the following program

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

The output of the program is:
2 4 6
2 5 7
3 3 6
3 4 7
3 5 8

Find Output

```
int main()
```

```
{
```

```
    int a,b;
```

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

```
    for (a=1; a<=4;a++)
```

```
{
```

```
        for (b=1; b<=5;b++)
```

```
            { printf("%d ", b*a); }
```

```
            printf("\n");
```

```
}
```

```
4 1 4  
2 8  
3 12  
4 16  
5 20  
6
```

```
}
```

```
5
```

```
3 1 2 3 4 5  
6 9 12 15 6
```



```
a
```

```
1
```

```
b
```

```
1
```



```
a * b
```

```
1
```

```
2
```

```
3
```

```
4
```

```
5
```

```
2
```

```
1
```

```
2
```

```
3
```

```
4
```

```
5
```

```
6
```

```
2
```

```
4
```

```
6
```

```
8
```

```
10
```

①

j

1 2 3 4 5

i	1	*	*	*	*	*
i	2	*	*	*	*	#
i	3	*	*	*	#	#
i	4	*	*	#	#	#
i	5	*	#	#	#	#

Basic Skeleton

②

i

1 2 3 4 5

j

$i \leq 5$

$j \leq 4$

$j \leq 3$

$j \leq 2$

$j \leq 1$

$j \leq 6 - i$

③

i

j

1 2 3 4 5

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

④

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

$\frac{i}{j}$
 $\frac{j}{i}$
 $j \geq 1$
 $j \geq 2$
 $j \geq 3$
 $j \geq 4$
 $j \geq 5$

$j \geq i$

$\frac{i}{j}$
 $\frac{j}{i}$
 1 2 3 4 5
 2 3 4 5
 3 4 5
 4 5
 5

\rightarrow | 2 3 4 5 K
| 2 3 4
| 2 3
| 2
|

i = 1
 $j = 1 \quad 2 \quad 3 \quad 4 \quad 5$
 $K = 1 \quad 2 \quad 3 \quad 4 \quad 5$

A B C D E

① K = 'A'

A B C D

② % C

A B C

A B
A

K = 'A' ✓

K = 65 ✓

Junaid