

NESTED LOOP

A loop inside loop

Nested for loop -

```
for (initialization; condition; increment/dec)
{
    for (initialization; condition; increment/dec)
    {
    }
}
```

Example -

```
for (int i=0; i<3; i++)
{
    for (int j=0; j<3; j++)
    {
        printf("Hello ");
    }
}
```

0 1 2 (3 times)
0 1 2 0 1 2 0 1 2

3x3
↓
9 times

i=0	0<3 True	
	j=0 0<3 True	Hello -
	j=1 1<3 True	Hello -
	j=2 2<3 True	Hello -
	j=3 3<3 False	
i=1	1<3 True	
	j=0 0<3 True	Hello -
	j=1 1<3 True	Hello -
	j=2 2<3 True	Hello -
	j=3 3<3 False	
i=2	2<3 True	
	j=0 0<3 True	Hello -
	j=1 1<3 True	Hello -
	j=2 2<3 True	Hello -
	j=3 3<3 False	
i=3	3<3 False	

Example 2:-

```
for (int i=0; i<5; i++)
{
    for (int j=0; j<6; j++)
    {
        printf("Hi ");
    }
}
```

0 1 2 3 4
0 1 2 3 4 5

How many times "Hi" will be printed? 30

DAY# 19.2

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break → keyword
It is used to break loops or exits from loop

```
for (int i=0; i<5; i++)
{
    printf("Hi\n");
    if (i==2)
    {
        break;
    }
}
```

i=0	0<5	TRUE	Hi
i=1	1<5	TRUE	Hi
i=2	2<5	TRUE	Hi

0==2	FALSE
1==2	FALSE
2==2	TRUE

"Hi" is printed 3 times

```
for (int i=0; i<10; i++)
{
    printf("Hi\n");
    if (i%2 == 0)
    {
        break;
    }
}
```

How many times "Hi" is printed?

2 2 1.

i=0	0<10	TRUE	Hi	0%2	0==0	FALSE	TRUE	Exit
i=1	1<10	TRUE	Hi	1%2	1==0	FALSE		
i=2	2<10	TRUE	Hi	2%2	0==0	TRUE		Exit

Hi is printed 1 time only.

char choice;

for (int i=0; i<10; i++) ~ Max 10 times if user doesn't enter 'Y'

```
{
    printf("Hi\n");
    printf("Enter Y/N:");
    scanf("%c", &choice);
    if (i==1)
    {
        if (choice == 'Y')
        {
            break;
        }
    }
}
```

Example :-

```
→ for (int i=0; i<10; i++)
{
    printf("Hi\n");
    if (i==0)
    {
        break;
    }
    → break;
    → break;
}
```

break;
→ break;

→ }