



Nested Loops: Patterns



Patterns

- Patterns are the designs created with the help of nested loops.
- In patterns, outer loops always point to the number of rows while inner loop points to the number of columns.
- Different types of patterns to create with programming are-
 - *Square patterns*
 - *Triangle Patterns*
 - *Miscellaneous Patterns*

Square Patterns

- A square pattern is the pattern whose number of rows and columns are fixed every time.

- **Example:-**

- In this example, the pattern is containing 3 rows and 4 columns.

Triangle Patterns

- A pattern in which number of rows are fixed but columns are variable is called triangle pattern.

- **Example:-**

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

- In this example, the number of rows are 5 but columns vary.

Making Patterns by Programming

- In this pattern, there are 3 rows and 5 columns.
- So we will put an outer loop for rows i.e., from 1 to 3.
- And We will take inner loop for columns i.e., from 1 to 5.

```
for(i=1; i<=3; i++)  
{  
    for (j=1;j<=5;j++)  
    {  
        Sop("*");  
    }  
}
```

Programs To Practice

1. # # # # #
 * * * * *

 # # # # #
 * * * * *

 # # # # #

2. # * # * # *
 # * # * # *
 # * # * # *
 # * # * # *
 # * # * # *

3. # * * * *
 * # * * *
 * * # * *
 * * * # *
 * * * * #

Assignment - Pattern Problems

4. * * * * #
 * * * # *
 * * # * *
 * # * * *
 # * * * *

5. # #
 # #
 #
 # #
 # #

6. # # # # #
 # #
 # #
 # #
 # # # # #

1st Pattern Program

- There are 5 rows and 5 columns. In every odd numbered row(1,3,5,...) there is a hash(#), and in every even numbered row(2,4,6,...) there is a star(*).

- **Source Code:-**

```
for (i=1;i<=5;i++)
{
    for(j=1;j<=5;j++)
    {
        if(i%2==0)
        {
            SOP(" * ");
        }
        else
        {
            SOP(" # ");
        }
    }
    SOPln(" ");
}
```

2nd Pattern Program

- There are 5 rows and 5 columns. In every odd numbered column(1,3,5,..) there is a hash(#), and in every even numbered column(2,4,6,..) there is a star(*).

- **Source Code:-**

```
for (i=1;i<=5;i++)
{
    for(j=1;j<=5;j++)
    {
        if(j%2==0)
        {
            SOP(" * ");
        }
        else
        {
            SOP(" # ");
        }
    }
    SOPln(" ");
}
```


3rd Pattern Program

- There are 5 rows and 5 columns.
- Here, in the left diagonal of a square, there is a # otherwise *. So, when $i==j$ there is a hash(#), otherwise star(*).

- **Source Code:-**

```
for (i=1;i<=5;i++)
{
    for(j=1;j<=5;j++)
    {
        if(i==j)
        {
            SOP(" # ");
        }
        else
        {
            SOP(" * ");
        }
    }
    SOPln(" ");
}
```