

Patterns in C programming

A pattern is an output format where elements such (*, numbers, letters) are printed in a specific sequence or shape based on defined logic or rule.

TRIANGLE 1:

```

- *
- * *
- * * *
- * * * *
- * * * * *
  
```

```

1
1 1
1 1 1
1 1 1 1
1 1 1 1 1
  
```

```

A
A A
A A A
A A A A
A A A A A
  
```

Height = 5

Height 3

```

*
* *
* * *
  
```

TRIANGLE 2:

```

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

```

1 1 1 1 1
1 1 1 1
1 1 1
1 1
1
  
```

```

A A A A A
A A A A
A A A
A A
A
  
```

```

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

PYRAMID -

```

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

```

  1
 1 1 1
1 1 1 1
1 1 1 1 1
  
```

```

    A
  A A A
A A A A A
A A A A A A
  
```

```

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

Diamond -

```

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

(Min. 5)

SQUARE.

```

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

```

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

Hollow -

```

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

Square pattern in C -

```

* * * *
* * * *
* * * *
* * * *
(4x4)
  
```

Sol1 - `printf("****\n****\n****\n****");` →

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


 issue - duplicate, n number of symbol '*'

Sol2 - `printf("\n ****");`
`printf("\n ****");`
`printf("\n ****");`
`printf("\n ****");`
 →

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

Best way is to use loops (for, while, do-while)

```
for (int j=0; j<4; j++)
{
    for (int i=0; i<4; i++)
    {
        printf("*");
    }
    printf("\n");
}
```

0 1 2 3 4 times
* * * *

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

j=0 0<4 True i=0 0<4 True
i=1 1<4 True
i=2 2<4 True
i=3 3<4 True
i=4 4<4 False

j=1 1<4 True
i=0 0<4 True
i=1 1<4 True
i=2 2<4 True
i=3 3<4 True
i=4 4<4 False

j=2 2<4 True " " "

j=3 3<4 True " " "

j=4 4<4 False

TRIANGLE PATTERN in C -

```
for (int i=0; i<5; i++)
{
    for (int j=0; j<=i; j++)
    {
        printf("*");
    }
    printf("\n");
}
```

Row 1st - *
2nd - * *
3rd - * * *
4th - * * * *
5th - * * * * *

i=0 0<5 TRUE

j=0 0<=0 TRUE } 1
j=1 1<=0 FALSE

i=1 1<5 TRUE

j=0 0<=1 TRUE } 2
j=1 1<=1 TRUE
j=2 2<=1 FALSE

i=2 2<5 TRUE

j=0 0<=2 TRUE } 3
j=1 1<=2 TRUE
j=2 2<=2 TRUE
j=3 3<=2 FALSE

i=3 3<5 TRUE " " " }

i=4 4<5 True " " " }

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

$i = 5$ $5 < 5$ false