

Shaping "skills" for "scaling" higher...!!!

WELCOME, PROGRAMMERS



01.

What is Pattern?



WHAT IS PATTFRN?





PATTERN



A "pattern" is a specific arrangement of characters or symbols in a systematic and predictable manner.

Patterns are often used for various purposes, such as

- creating shapes,
- printing formatted outputs, or
- recognizing specific sequences of characters.



CATEGORIES OF PATTERNS



Here are common categories of Patterns:

Number

Pattern

1 2

1 2 3

1 2 3

Character

Pattern

4 A В

АВС

ABCD

Symbol

Pattern

*

* *

* * *

* * * *



TYPES OF PATTERNS



Here are common types of Patterns:



Without Space
Pattern

1 12 123 1234 12345

With Space
Pattern



Custom Pattern



02.

What is Structures of Patterns?





STRUCTURES OF PATTERNS?





STRUCTURES OF PATTERNS



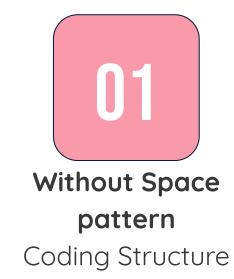
Any type of pattern can be done using the coding structure of Nested loop.

Generally, all patterns are done with **nested for loop**. But we can use any other loop also.



Let's see the **pre-defined coding structures** for all types of **patterns**...





```
// Outer Loop
for()
   // Inner Loop
   for()
       // code
```





With Space pattern
Coding Structure

```
RED & WHITE

Multimedia Education

Shaping "skills" for "scaling" higher...!!!
```

```
// Outer Loop
for()
   // Inner Loop for space
   for()
       // code
   // Inner Loop
   for()
       // code
```



Custom patternCoding Structure

- / >
 - No any fixed coding structure
 - We have to create as per the given pattern



Note that,

- Outer loop always iterates for Rows
- Inner loop always iterates for Columns



HOW TO SOLVE ANY PATTERN



Any type of pattern can be easily solved by following steps:

- 1. Divide a pattern into row and column
- 2. Analysis the given Pattern
- 3. Make a Code



Let's see **Without Space pattern** in detail with some examples...



 1
 2
 3
 4
 5

 1
 2
 3
 4
 5

 1
 2
 3
 4
 5

 1
 2
 3
 4
 5

 1
 2
 3
 4
 5

 1
 2
 3
 4
 5



Break down into row & column



		Columns				
		1	2	3	4	5
Rows	1	1	2	3	4	5
	2	1	2	3	4	5
	3	1	2	3	4	5
	4	1	2	3	4	5
	5	1	2	3	4	5



Analysis the given pattern



- **Total 5 Rows**
 - Outer loop iterates 5 times
 - From 1 to 5
- **Total 5 Columns**
 - Inner loop iterates 5 times
 - From 1 to 5

		Columns == Inner Loop						
		1	1 2 3 4					
Rows == Outer Loop	1	1	2	3	4	5		
	2	1	2	3	4	5		
	3	1	2	3	4	5		
	4	1	2	3	4	5		
	5	1	2	3	4	5		





Make a Code



```
for ( i=1; i<=5; i++ )
    for ( j=1; j<=5; j++ )
         printf("%d", j);
    printf("\n");
```

							7	
		Col	Columns == Inner Loop					
		1	2	3	4	5		
	1	1	2	3	4	5		
Rows == Outer	2	1	2	3	4	5		
	3	1	2	3	4	5		
Loop	4	1	2	3	4	5		
	5	1	2	3	4	5		



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



Break down into row & column



		Columns				
		1	2	3	4	5
Rows	1	1				
	2	1	2			
	3	1	2	3		
	4	1	2	3	4	
	5	1	2	3	4	5



Analysis the given pattern



- **Total 5 Rows**
 - Outer loop iterates 5 times
 - From 1 to 5
- Total i no. of Columns
 - Inner loop iterates i times
 - From 1 to i

Where, i == No. of row

		Columns == Inner Loop				
		1	2	3	4	5
Rows == Outer Loop	1	1				
	2	1	2			
	3	1	2	3		
	4	1	2	3	4	
	5	1	2	3	4	5



Make a Code



```
for ( i=1; i<=5; i++ )
    for ( j=1; j<=i; j++ )
         printf("%d", j);
    printf("\n");
```

		Columns == Inner Loop					
		1	2	3	4	5	
	1	1					
Rows == Outer Loop	2	1	2				
	3	1	2	3			
	4	1	2	3	4		
	5	1	2	3	4	5	





Let's start now...





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