

Character Patterns

Pattern 1.9

```
# N = 4
ABCD
ABCD
ABCD
ABCD
```

Approach:

From the above pattern **we can observe:**

- **Number of Rows:** The pattern has 4 rows. We have to print the pattern for N rows.
- **Number of Columns:** All the rows have 4 columns. Thus, in a pattern of N rows, all the rows will have N columns.
- **What to print:** The 1st column has all A's, 2nd column has all B's, and so on. The **ASCII** value of A is 65. In the 1st column, the character corresponds to the **ASCII** value 65 (64+1). In the 2nd column, the character corresponds to the **ASCII** value 66 (64+2). Thus, all the entries in the ith column are equal to the character corresponding to the **ASCII** value 64+i. The chr() function gives the character associated with the integral ASCII value within the parentheses.

Python Implementation:

```
N=int(input()) #Take user input, N= Number of Rows
row=1; #The loop starts with the 1st row
while row<=N: #Loop will on for N rows
    col=1; #The loop starts with the first column in the current row
    while col<=N: #Loop will on for N columns
        print(chr(64+col),end="") #Printing a (*) in all columns
        col=col+1 #Increment the current column (Inner Loop)
```

```
row=row+1 #Increment the current row (Outer Loop)  
print() #Add a new Line after each row is printed
```

Pattern 1.10

```
# N = 4  
ABCD  
BCDE  
CDEF  
DEFG
```

Approach:

From the above pattern **we can observe:**

- **Number of Rows:** The pattern has 4 rows. We have to print the pattern for N rows.
- **Number of Columns:** All the rows have 4 columns. Thus, in a pattern of N rows, all the rows will have N columns.
- **What to print:** This pattern is very similar to **Pattern 1.5**. We can implement this using a similar code with a minor change. Instead of integers, we need capital letters of the same order. Instead of 1, we need A, instead of 2, we need B and so on. **ASCII** value of A is 65. Thus if we add 64 to all the entries in **Pattern 1.5** and find their **ASCII** values, we will get our result. The `chr()` function gives the character associated with the integral **ASCII** value within the parentheses.

Python Implementation:

```
N=int(input()) #Take user input, N= Number of Rows  
row=1; #The loop starts with the 1st row  
while row<=N: #Loop will on for N rows  
    col=1; #The loop starts with the first column in the current row  
    while col<=N: #Loop will on for N columns  
        print(chr(64+col+row-1),end="") # Adding 64 to all entries
```

```
col=col+1 #Increment the current column (Inner Loop)
row=row+1 #Increment the current row (Outer Loop)
print() #Add a new Line after each row is printed
```

Practice Problems

Here are a few similar patterns problems for your practice. All the patterns have been drawn for N=4.

```
A
AB
ABC
ABCD
```

```
12344321
123**321
12****21
1*****1
```

```
ABCD
ABC
AB
A
```

```
4555
3455
2345
1234
```

```
1
11
202
3003
```

```
A
BB
```

CCC
DDDD