K. J. Somaiya College of Engineering, Mumbai-77

A Constituent College of Somaiya Vidyavihar University

Batch: D2	**Roll No.:** 16010221038
Experiment / assignment / tutorial No. 4	
Grade: AA / AB / BB / BC / CC / CD /DD	
Signature of the Staff In-charge with date	

TITLE: Program to print patterns

AIM: Program to print patterns for 'n' rows using nested loop

Expected OUTCOME of Experiment:

Books/ Journals/ Websites referred:

1. Programming in C, second edition, Pradeep Dey and Manas Ghosh, Oxford University Press.
2. Programming in ANSI C, fifth edition, E Balagurusamy, Tata McGraw Hill.
3. Introduction to programming and problem solving , G. Michael Schneider ,Wiley India edition.
4. **http://cse.iitkgp.ac.in/~rkumar/pds-vlab/**

Problem Definition:

The program is to print a pattern as given by the user. The program makes use of a nested loop to print a pattern of characters, numbers or alphabets.

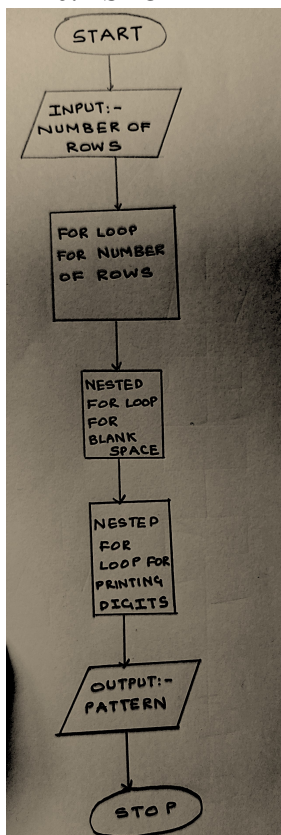### Example:

Input: number of rows = 4, number of columns = 4

Output:

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

Algorithm:

1. START
2. INPUT IS ASKED FOR THE NUMBER OF ROWS
3. A FOR LOOP IS EXECUTED TO PRINT THE NUMBER OF ROWS
4. A NESTED FOR LOOP IS EXECUTED TO PRINT BLANK SPACES IN EACH ROW
5. A NESTED FOR LOOP IS EXECUTED TO PRINT THE NUMBERS IN EACH ROW
6. STOP

Implementation details:

```c
#include<stdio.h>
int main() {
int n;
printf("Enter the number of rows: \n5");
    scanf("%d", &n);
int c = n;
for(int i = 1; i <= n; i++)
{
for(int j = n; j >= i; j--) {
printf(" ");
}
int x = c;
for(int k = 1; k <= i; k++) {
printf("%d", x++);
}
c--; printf("\n");
}

}
```

Output(s):

```
Enter the number of rows:
5
    5
   45
  345
 2345
12345
Program ended with exit code: 0
```

Conclusion:

Using this program, we obtain the pattern based on users choice of number of rows .
We also understand the concept of loops in c programming and it's implementation.

Post Lab Descriptive Questions

Write a program to print the following:

```
1
2    4
3    6    9
4    8    12   16
5    10   15   20   25
6    12   18   24   30   36
7    14   21   28   35   42   49
8    16   24   32   40   48   56   64
9    18   27   36   45   54   63   72   81
10   20   30   40   50   60   70   80   90   100
```

ANS:

```c
#include <stdio.h>
int main()
{
int n;
printf("Enter number of rows \n"); scanf("%d", &n);
for(int i=1;i<=n;i++)
{
for(int j=1;j<=i;j++)
{
int p=i*j;
printf("%d ", p);
}
printf("\n");
}
}
```

```
Enter number of rows
10
1
2 4
3 6 9
4 8 12 16
5 10 15 20 25
6 12 18 24 30 36
7 14 21 28 35 42 49
8 16 24 32 40 48 56 64
9 18 27 36 45 54 63 72 81
10 20 30 40 50 60 70 80 90 100
Program ended with exit code: 0
```

Date: __09.12.21_____   **Signature of faculty**
in-charge