

K. J. Somaiya College of Engineering, Mumbai-77
A Constituent College of Somaiya Vidyavihar University

Batch: G3 Roll No.: 16010421063

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:

CO2: Apply Basic concepts of C programming for Problem solving

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

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Output: 5

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

Algorithm:

Step-1 - Enter number or 'rows'

Step-2 - Run a for loop for row number of times(i)

Step-3 - Inside the bigger for loop insert two for loops

Step-4 - First for loop for the number of blank spaces required

Step-5 - Second for loop to get the desired numbers.

Step-5.1 - we run the second loop (row-i)times

Step-6 - After each iteration we add a new line

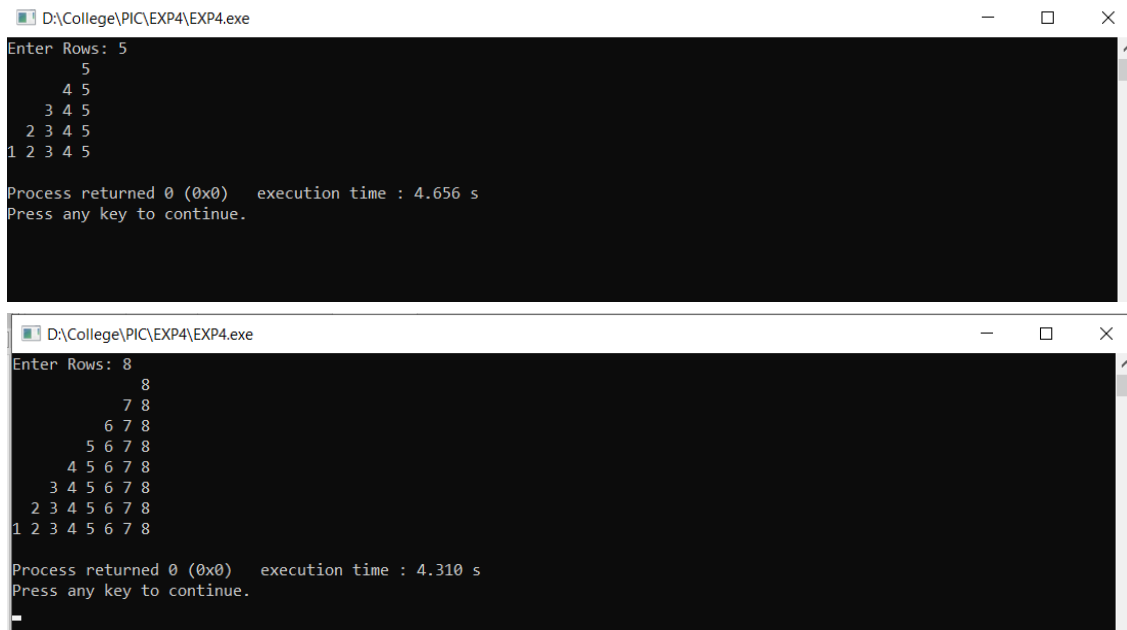
Step-7 - After loop is finished Program Stops

Implementation details:

```
#include<stdio.h>
//Code by Arya Nair
int main()
{
    int rows;
    printf("Enter Rows: ");
    scanf("%d",&rows);
    for(int i = rows; i >= 1; i--)
    {
        for(int j = 1; j < i; j++)
        {
            printf(" ");
        }
        for(int j =i; j <= rows; j++)
        {
            printf("%d ", j);
        }
        printf("\n");
    }
}
```

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Output(s):



The image shows two screenshots of a Windows command prompt window running a C program. The window title is "D:\College\PIC\EXP4\EXP4.exe".

The first screenshot shows the program's output for 5 rows. The user enters "5" at the prompt "Enter Rows: ". The output is a pattern of numbers 1 through 5, arranged in 5 rows. The first row contains the number 5. The second row contains 4 5. The third row contains 3 4 5. The fourth row contains 2 3 4 5. The fifth row contains 1 2 3 4 5. Below the pattern, the program displays "Process returned 0 (0x0) execution time : 4.656 s" and "Press any key to continue.".

The second screenshot shows the program's output for 8 rows. The user enters "8" at the prompt "Enter Rows: ". The output is a pattern of numbers 1 through 8, arranged in 8 rows. The first row contains the number 8. The second row contains 7 8. The third row contains 6 7 8. The fourth row contains 5 6 7 8. The fifth row contains 4 5 6 7 8. The sixth row contains 3 4 5 6 7 8. The seventh row contains 2 3 4 5 6 7 8. The eighth row contains 1 2 3 4 5 6 7 8. Below the pattern, the program displays "Process returned 0 (0x0) execution time : 4.310 s" and "Press any key to continue.".

Conclusion:

By using basic concepts of C programming we are able to create the required output.

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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

```
#include <stdio.h>
//Code by Arya Nair
int main()
{
    int row = 10;
    for(int i = 1; i <= row; i++)
    {
        for(int j = 1; j <= i; j++)
        {
            printf("%d ", i * j);
        }
        printf("\n");
    }

    return 0;
}
```

Date: _____

Signature of faculty in-charge

Department of Science and Humanities