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

A Constituent College of Somaiya Vidyavihar University

Batch:C2-2　　　**Roll No.: 16010122109**
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 = 5, number of columns = 5

Output:

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

Algorithm:

1.   Start
2.   Declare variable a for the loops (i,j,k) and for the number of rows. [k is the space loop]
3.   Input the number of rows.
4.   Write the for loop of i,j and k to make the given pattern.
5.   Print the following pattern using i and j for loops .
6.   Stop

Implementation details:

```c
#include<stdio.h>

void main()

{

   int n;

printf("Enter the number of rows you want ");

scanf("%d",&n);

   int t=n+1;

   for(int i=1;i<=n;i++)

{

     for(int j=1;j<=(n-i);j++)

     {

printf("  ");

     }
```
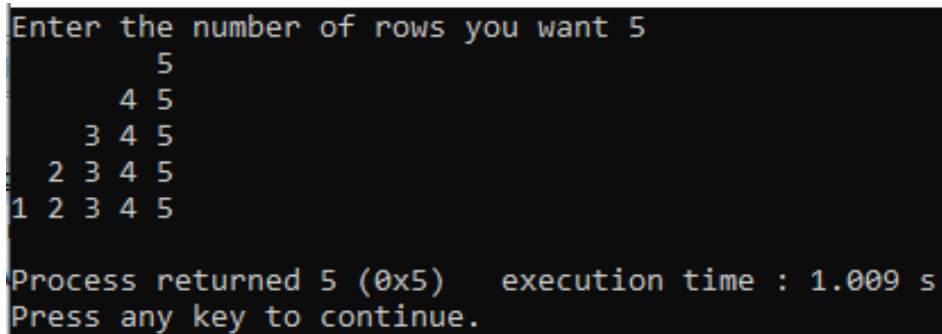
```
for(int k=1,m=t-i;k<=i;k++,m++)
```

```
printf("%d ",m);
```

```
printf("\n");
```

```
}
```

```
}
```

Output(s):

```
Enter the number of rows you want 5
        5
      4 5
    3 4 5
  2 3 4 5
1 2 3 4 5

Process returned 5 (0x5)   execution time : 1.009 s
Press any key to continue.
```

Conclusion:
Thus, we learnt to make pattern using c programming language.

Post Lab Descriptive Questions

a)   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

CODE:

```c
#include<stdio.h>

void main()

{

int m;

for(int i=1;i<11;i++)

    {

        for(int j=1;j<=i;j++)

        {

        m=i*j;

printf("%d ",m);

        }

printf("\n");

}

}
```

```
C:\Users\DELL\OneDrive\Documents\pic.exe

Enter the 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


Process returned 0 (0x0)   execution time : 2.211 s
Press any key to continue.
```

b) Write a program to print the following pattern:
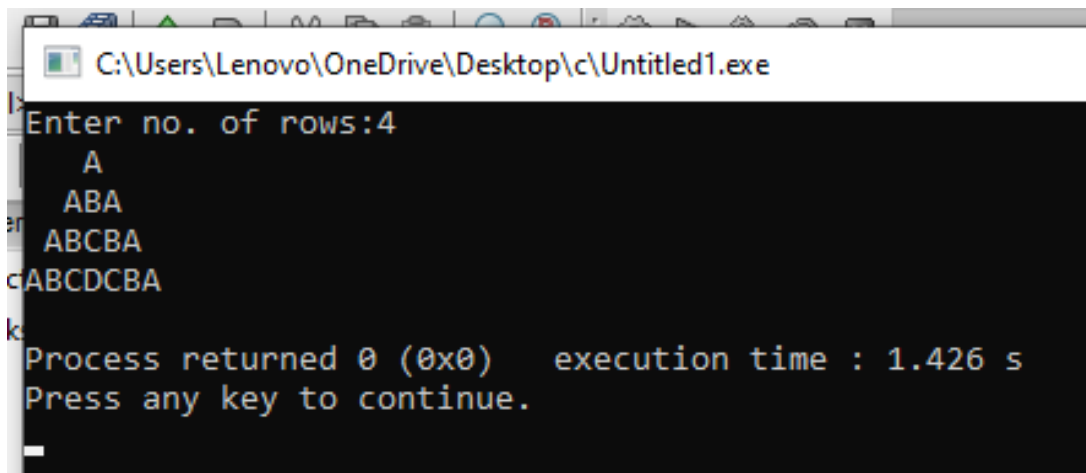
```
   A
  ABA
 ABCBA
ABCDCBA
```

CODE:

```c
#include<stdio.h>
int main()
{
int i,j,k,n,sp;
printf("Enter no. of rows:");
scanf("%d",&n);
sp=n-1;
for(i=1;i<=n;i++)
{
for(k=1;k<=sp;k++)
{
   printf(" ");
}
sp--;
for(j=1;j<=i;j++)
```

```
{
  printf("%c",(char)(j+64));
}
for(j=i-1;j>=1;j--)
{
  printf("%c",(char)(j+64));
}
printf("\n");
}
}
```


Date: _____   **Signature of faculty in-charge**