Experiment No.1:

Write a program in C to display the following patterns like

Right-angle triangle with a number:	Diamond shape with numbers:	Pyramid with an asterisk:	Pyramid using the alphabet:
1	1	*	A
12	2 2	* *	A B A
123	3 3 3	* * *	A B C B A
1234	4 4 4 4	* * * *	A B C D C B A
	3 3 3		
	2 2		
	1		

```c
// DSA Program 1
#include <stdio.h>
int rows;
void rightAngleTriangleWithNumbers(int);
void diamondShapeWithNumbers(int);
void pyramidWithAsterisks(int);
void pyramidWithAlphabets(int);

int main()
{
    int rows = 4;

    rightAngleTriangleWithNumbers(rows);
    diamondShapeWithNumbers(rows);
    pyramidWithAsterisks(rows);
    pyramidWithAlphabets(rows);

    return 0;
}

void rightAngleTriangleWithNumbers(int n)
{
    printf("Right-angle Triangle with Numbers:\n");
    for (int i = 1; i <= n; i++)
      {
        for (int j = 1; j <= i; j++)
         {
           printf("%d", j);
         }
        printf("\n");
```

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    }
}

void diamondShapeWithNumbers(int n)
{
    printf("\nDiamond Shape with Numbers:\n");

    // Upper half (including middle)
    for (int i = 1; i <= n; i++)
    {
        for (int space = 1; space <= n - i; space++)
        {
            printf(" ");
        }
        for (int j = 1; j <= i; j++)
        {
            printf("%d ", i);
        }
        printf("\n");
    }

    // Lower half
    for (int i = n - 1; i >= 1; i--)
    {
        for (int space = 1; space <= n - i; space++)
        {
            printf(" ");
        }
        for (int j = 1; j <= i; j++) {
            printf("%d ", i);
        }
        printf("\n");
    }
}

void pyramidWithAsterisks(int n)
{
    printf("\nPyramid with Asterisks:\n");
    for (int i = 1; i <= n; i++)
    {
        // spaces
        for (int j = 1; j <= n - i; j++)
        {
            printf(" ");
```

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        }
        // asterisks
        for (int j = 1; j <= 2 * i - 1; j++)
        {
            printf("*");
        }
        printf("\n");
    }
}

void pyramidWithAlphabets(int n)
{
    printf("\nPyramid with Alphabets:\n");
    for (int i = 1; i <= n; i++)
    {
        // spaces
        for (int j = 1; j <= n - i; j++)
        {
            printf(" ");
        }

        // increasing characters
        char ch = 'A';
        for (int j = 1; j <= i; j++)
        {
            printf("%c", ch++);
        }

        // decreasing characters
        ch -= 2;
        for (int j = 1; j < i; j++)
        {
            printf("%c", ch--);
        }

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