Title: Control Structure- do-while, while & for loop in C

Objective:

The main objectives of this lab are to

- Learn about how to Sum using do while
- Learn about hoe to Print Odd numbers till n using while
- Learn about how to display Star pattern using for loop

Theory:

In programming, a loop is used to repeat a block of code until the specified condition is met.
C programming has three types of loops:

1. for loop
2. while loop
3. do...while loop

for Loop

The syntax of the for loop is:

```
for (initializationStatement; testExpression; updateStatement)
{
   // statements inside the body of loop
}
```

while loop

The syntax of the while loop is:

```
while (testExpression) {
  // the body of the loop
}
```

do...while loop

The do..while loop is similar to the while loop with one important difference. The body of do...while loop is executed at least once. Only then, the test expression is evaluated. The syntax of the do...while loop is:

```
do {
  // the body of the loop
}
while (testExpression);
```

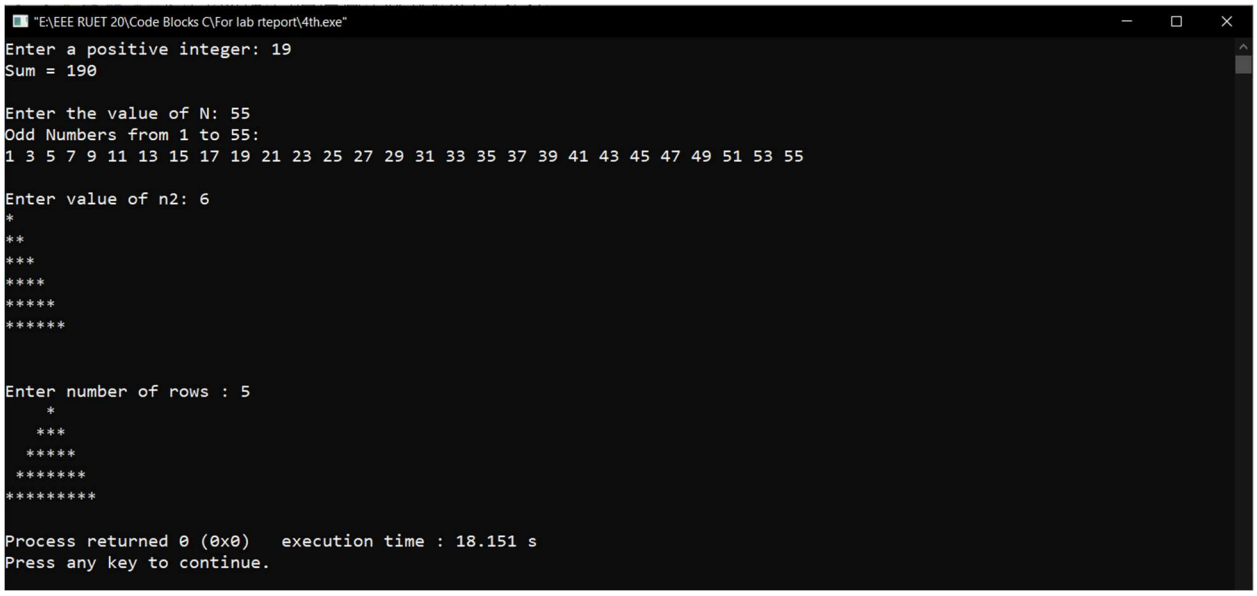
Source Code:

```
/// Sum using do while loop in c.
#include <stdio.h>
int main()
{
    int n, i=1, sum = 0;

    printf("Enter a positive integer: ");
    scanf("%d", &n);

    do
    {
        sum += i;
        ++i;
    }
    while (i <= n);

    printf("Sum = %d", sum);
    printf("\n\n");

/// Print Odd numbers till n using while

    //loop counter declaration
    int number;
    //variable to store limit /N
```

```
int n1;

//assign initial value
//from where we want to print the numbers
number=1;

//input value of N
printf("Enter the value of N: ");
scanf("%d",&n1);

//print statement
printf("Odd Numbers from 1 to %d:\n",n1);

//while loop, that will print numbers
while(number<=n1)
{
   //Here is the condition to check ODD number
   if(number%2 != 0)
      printf("%d ",number);

   // increasing loop counter by 1
   number++;
}
printf("\n\n");

/// Star Pattern using for loop
/*
*
**
***
****
*****
Right Triangle Star Pattern
*/

int i1, j, n2;

//Input number of rows from user
printf("Enter value of n2: ");
scanf("%d", &n2);

for(i1=1; i1<=n2; i1++)
{
   //Print i number of stars
   for(j=1; j<=i1; j++)
```

```
70.      {
71.         printf("*");
72.      }
73.
74.      //Move to next line
75.      printf("\n");
76.   }
77.   printf("\n\n");
78.
79.   /*
80.       *
81.      ***
82.     *****
83.    *******
84.   *********
85.   Pyramid Star Pattern
86.   */
87.
88.   int i3, j1, rows;
89.
90.   //Input number of rows to print
91.   printf("Enter number of rows : ");
92.   scanf("%d", &rows);
93.
94.   //Iterate through rows
95.   for(i3=1; i3<=rows; i3++)
96.   {
97.      //Print leading spaces
98.      for(j1=i3; j1<rows; j1++)
99.      {
100.                printf(" ");
101.             }
102.
103.             //Print star
104.             for(j1=1; j1<=(2*i3-1); j1++)
105.             {
106.                printf("*");
107.             }
108.
109.             //Move to next line
110.             printf("\n");
111.          }
112.
113.          return 0;
114.       }
```

Output:



Discussion and Conclusion:

In this whole program, there is 3 section. In the first section I take a number from user and display the summation till that number. In the next section I take a number from the user again and display only the odd numbers till that number which user input. Lastly, I print two star pattern. Num 1: Right triangle star pattern & Num 2: Pyramid star pattern.