

# **Program Design and Development Lab**

## **(Subject Code: 15IT102L)**



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**BONAFIDE CERTIFICATE**

It is to be certified that the bonafide work done by K.Srikant Iyer of IInd Semester / Ist Year B.Tech Degree course in SRM Institute of Management and Science Technology in INFORMATION TECHNOLOGY Department has been done in the Program Design and Development Laboratory during the academic year Feb 2016-May 2016.

**HEAD OF DEPARTMENT**

**LAB IN-CHARGE**

*Submitted for the university examination held on \_\_\_\_\_*

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**SUBJECT CODE: 15IT102L**

**SUBJECT NAME: Prog. Design & Development Lab**

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## EXPERIMENT: 1

### AIM:

Program to demonstrate the function of the printf( ) and scanf( ) and sizeof() functions.

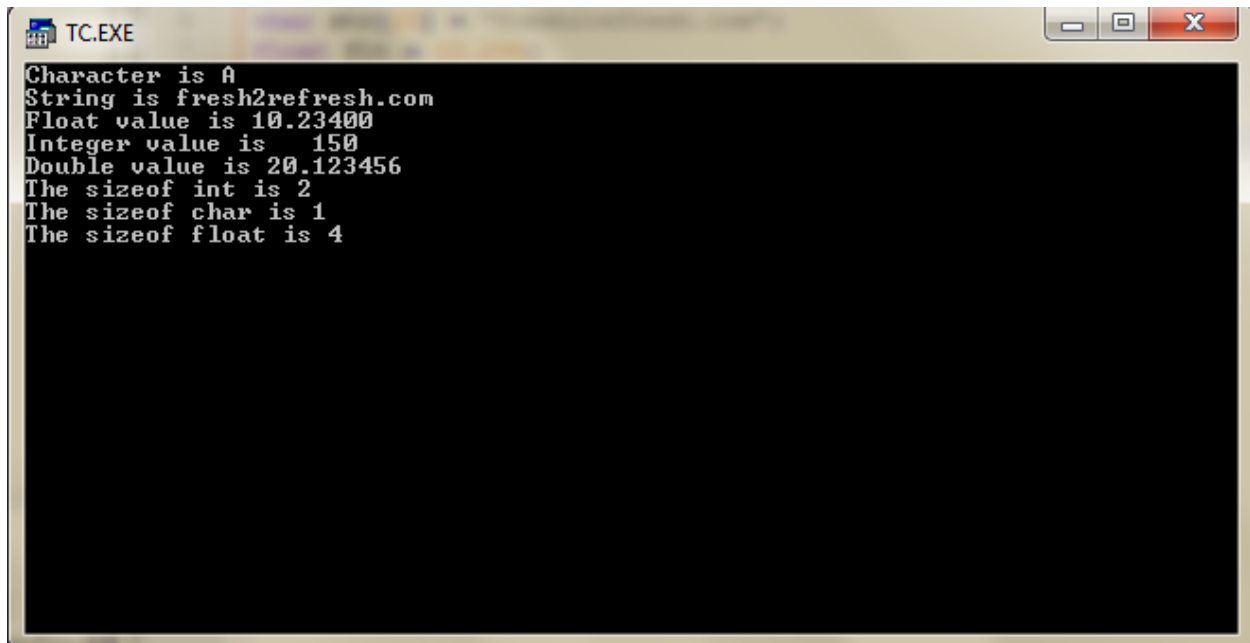
### OBJECTIVE:

To illustrate printf( ) and scanf( ) & sizeof( ).

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    char ch='A';
    char str[20] = "fresh2refresh.com";
    float flt = 10.234;
    int no = 150;
    double dbl = 20.123456;
    clrscr( );
    printf("Character is %c \n", ch);
    printf("String is %s \n", str);
    printf("Float value is %0.5f \n", flt);
    printf("Integer value is %5d \n", no);
    printf("Double value is %lf \n", dbl);
    printf("The sizeof int is %d \n",sizeof(int));
    printf("The sizeof char is %d \n",sizeof(char));
    printf("The sizeof float is %d \n",sizeof(float));
    getch( );
}
```

## OUTPUT:

A screenshot of a Turbo C++ (TC.EXE) window. The window has a title bar with the text "TC.EXE" and standard Windows window controls (minimize, maximize, close). The main area is a black console with white text. The output of the program is as follows:

```
Character is A
String is fresh2refresh.com
Float value is 10.23400
Integer value is 150
Double value is 20.123456
The sizeof int is 2
The sizeof char is 1
The sizeof float is 4
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 2

### AIM:

Program to perform arithmetic operations.

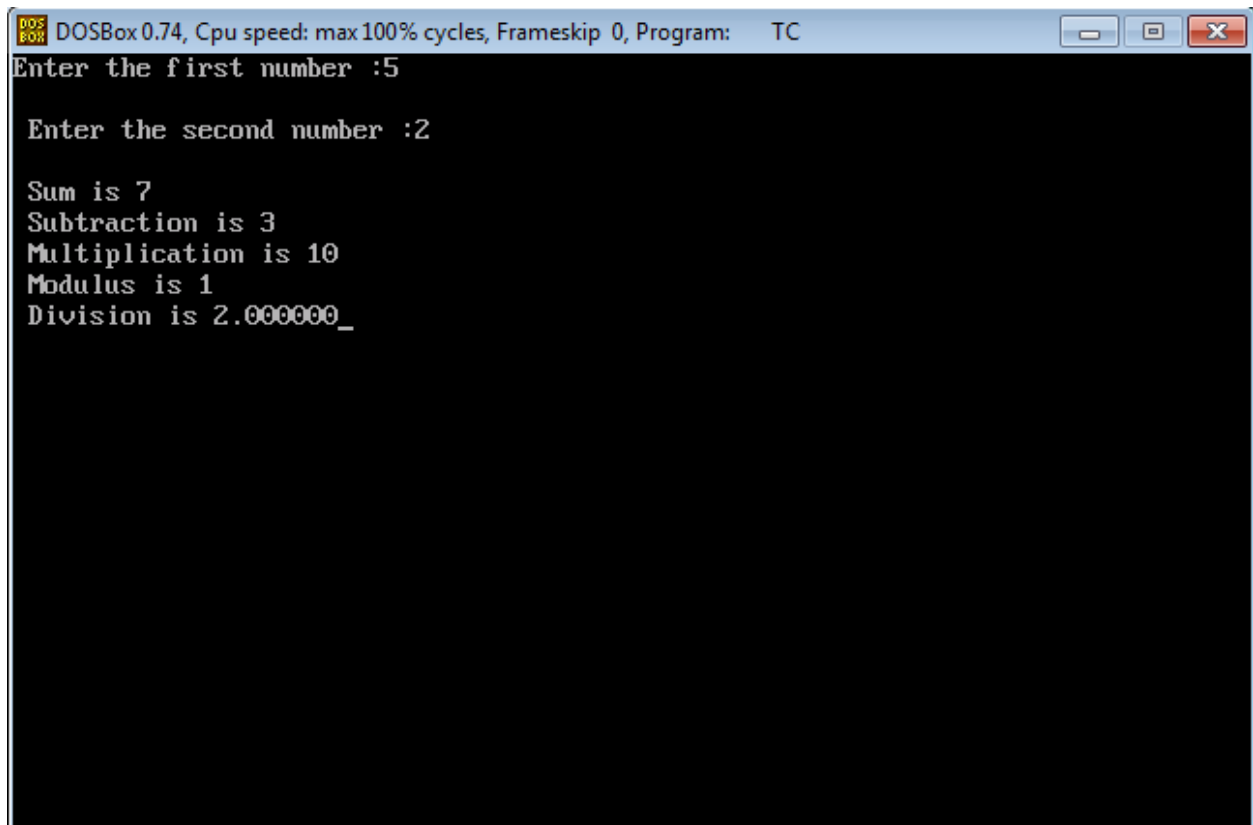
### OBJECTIVE:

To illustrate various arithmetic functions.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    int n1,n2;
    int a,b,c,d;
    float e;
    clrscr( );
    printf("Enter the first number :");
    scanf("%d",&n1);
    printf("\n Enter the second number :");
    scanf("%d",&n2);
    a=n1+n2;
    printf("\n Sum is %d",a);
    b=n1-n2;
    printf("\n Subtraction is %d",b);
    c=n1*n2;
    printf("\n Multiplication is %d",c);
    d=n1%n2;
    printf("\n Modulus is %d",d);
    e=n1/n2;
    printf("\n Division is %f",e);
    getch( );
}
```

## OUTPUT:



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
Enter the first number :5
Enter the second number :2
Sum is 7
Subtraction is 3
Multiplication is 10
Modulus is 1
Division is 2.000000_
```

## RESULT:

The program is executed successfully.



## EXPERIMENT: 3

### AIM:

Program to find average of two numbers with algorithm & flowchart.

### OBJECTIVE:

To demonstrate a program using algorithm and flowchart.

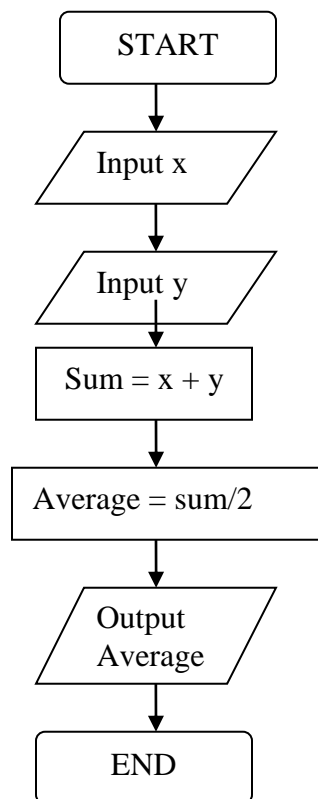
### ALGORITHM:

Input: three numbers x,y,z.

Output: the average of x and y

1. input x
2. input y
3.  $\text{sum} = x + y$
4.  $\text{average} = \text{sum} / 2$
5. output average

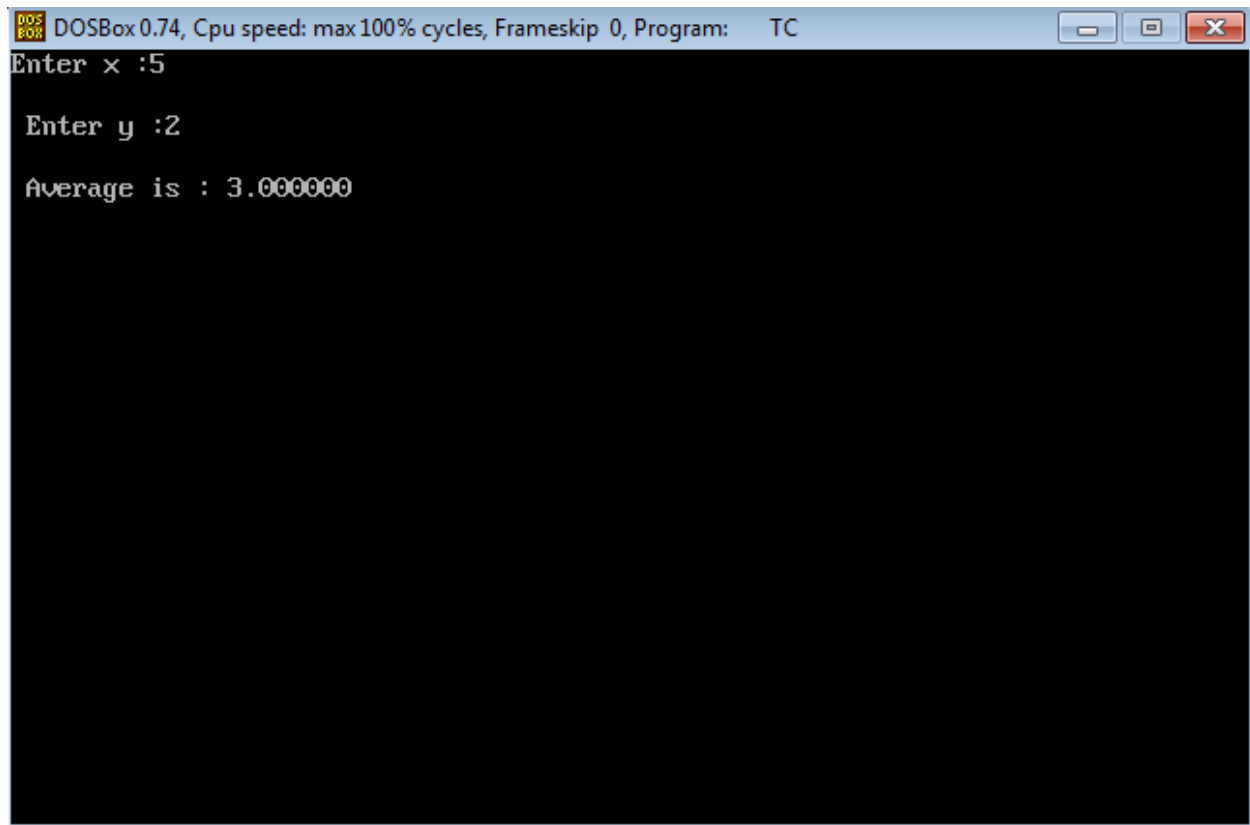
### FLOWCHART:



**PROGRAM:**

```
#include<stdio.h>
#include<conio.h>
void main( )
{
int x,y,sum;
float avg;
clrscr( );
printf("Enter x :");
scanf("%d",&x);
printf("\n Enter y :");
scanf("%d",&y);
sum=x+y;
avg=sum/2;
printf("\n Average is : %f",avg);
getch( );
}
```

## OUTPUT:

A screenshot of a DOSBox window. The title bar reads "DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC". The window contains a black background with white text. The text shows the program prompting for input: "Enter x :5", "Enter y :2", and then displaying the result: "Average is : 3.000000".

```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
Enter x :5
Enter y :2
Average is : 3.000000
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 4

### AIM:

Program to print whether the temprature is above or below freezing point.

### OBJECTIVE:

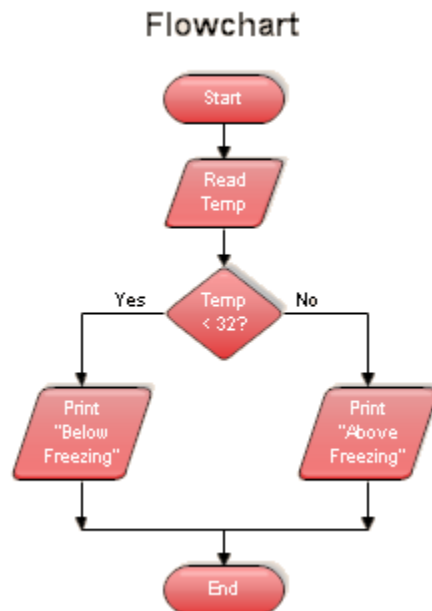
To illustrate about if statement.

### ALGORITHM:

#### STEPS:

1. Start
2. Input"Temprature"
3. If ( $T > 32$ )  
Output"Above Freezing Point."
4. else  
Output"Below Freezing point"
5. End

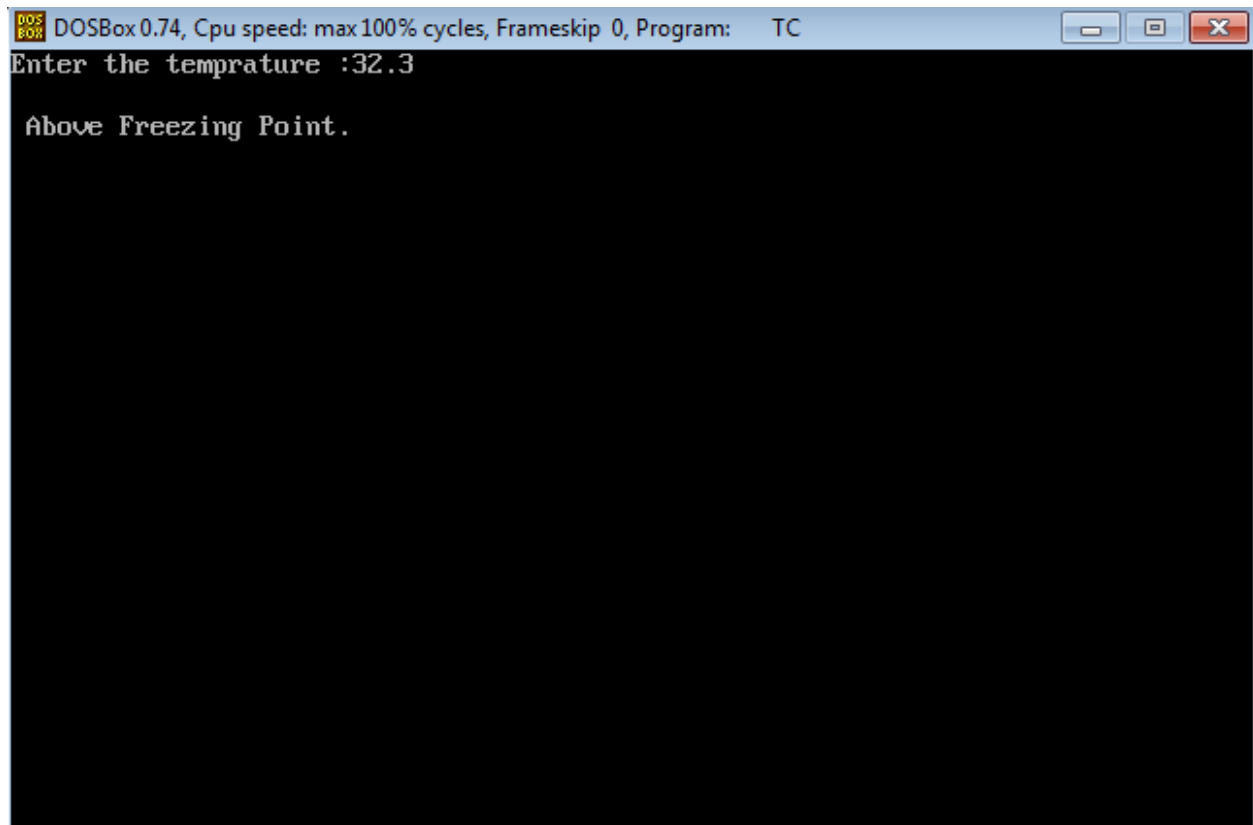
### FLOW-CHART:



**PROGRAM:**

```
#include<stdio.h>
#include<conio.h>
void main( )
{
float t;
clrscr( );
printf("Enter the temprature :");
scanf("%f",&t);
if(t>32)
printf("\n Above Freezing Point.");
else
printf("\n Below Freezing Point.");
getch( );
}
```

## OUTPUT:

A screenshot of a DOSBox window. The title bar reads "DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC". The window contains a black background with white text. The first line of text is "Enter the temprature :32.3". The second line of text is "Above Freezing Point.".

```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
Enter the temprature :32.3
Above Freezing Point.
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 5

### AIM:

Program to find if a number is greater or smaller or equal to another number.

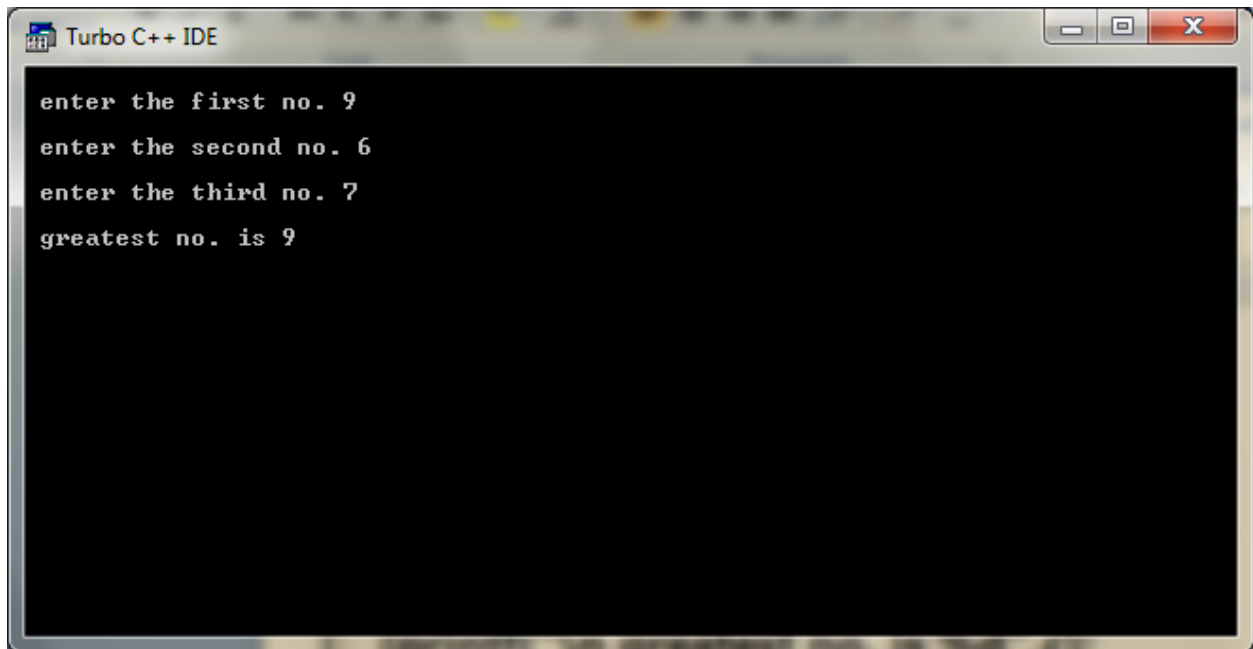
### OBJECTIVE:

To illustrate use of else if statement.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    int a,b,c;
    clrscr( );
    printf("\n enter the first no. ");
    scanf("%d",&a);
    printf("\n enter the second no. ");
    scanf("%d",&b);
    printf("\n enter the third no. ");
    scanf("%d",&c);
    if(a>=b&&a>=c)
    {
        printf("\n greatest no. is %d ",a);
    }
    else if(b>=a&&b>=c)
    {
        printf("\n greatest no. is %d",b);
    }
    else if(c>=a&&c>=b)
    {
        printf("\n greatest no. is %d",c);
    }
    else
    {
        printf("\n all no.s are equal %d %d %d",a,b,c);
    }
    getch( );
}
```

## OUTPUT:

A screenshot of the Turbo C++ IDE's output window. The window has a title bar that says "Turbo C++ IDE" and standard Windows window controls (minimize, maximize, close). The output area is black with white text. The text displayed is: "enter the first no. 9", "enter the second no. 6", "enter the third no. 7", and "greatest no. is 9".

```
enter the first no. 9
enter the second no. 6
enter the third no. 7
greatest no. is 9
```

## RESULT:

The program is executed successfully.



## EXPERIMENT: 6

### AIM:

Write a program to check whether a number is even or odd.

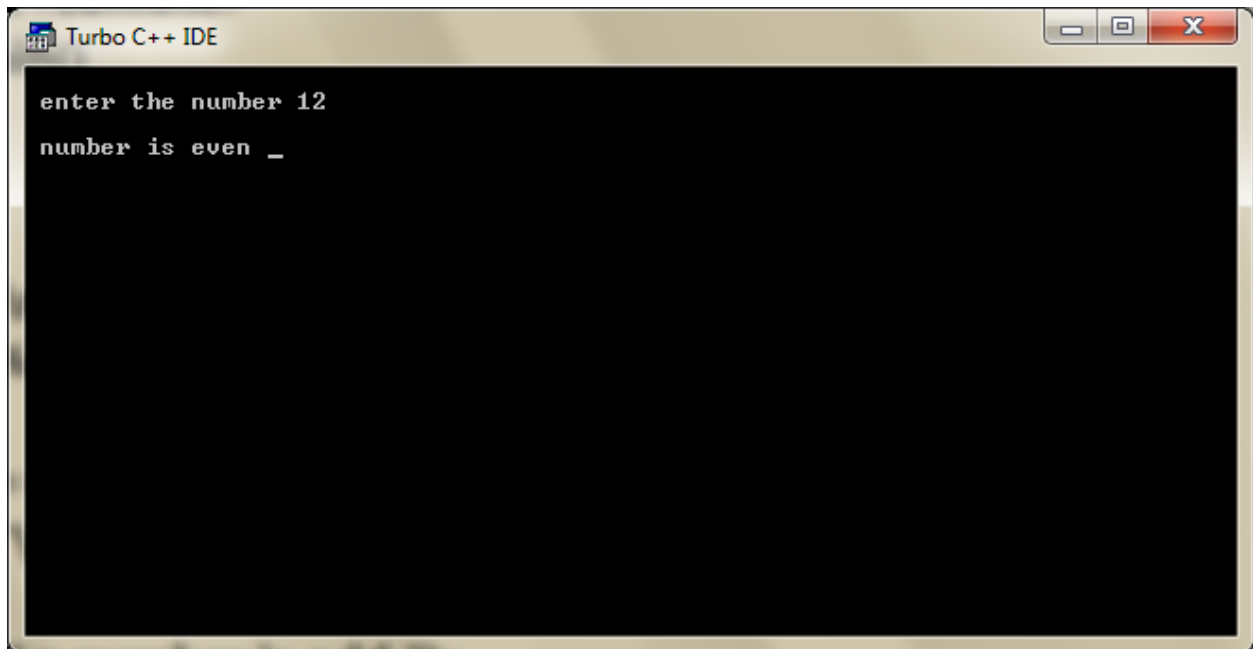
### OBJECTIVE:

To illustrate use of if statement.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    int a;
    clrscr();
    printf("\n enter the number ");
    scanf("%d",&a);
    if(a%2==0)
        printf("\n number is even ");
    else
        printf("\n number is odd ");
    getch( );
}
```

## OUTPUT:

A screenshot of the Turbo C++ IDE window. The title bar reads "Turbo C++ IDE". The main window area is black with white text. The first line of text is "enter the number 12". The second line of text is "number is even \_".

```
enter the number 12
number is even _
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 7

### AIM:

Program to print number from 1 to 100 using goto statement.

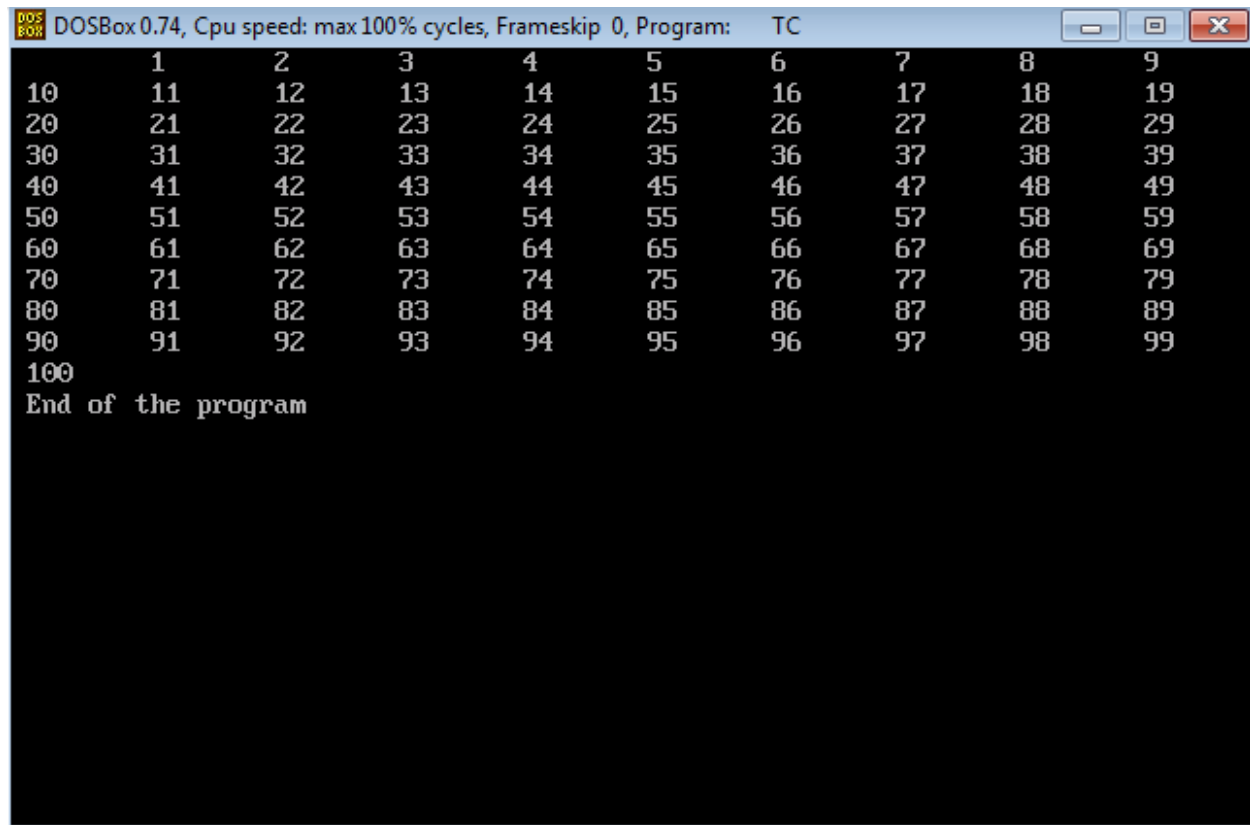
### OBJECTIVE:

To illustrate the use of goto statement.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    int n=0;
    clrscr( );
    a: n=n+1; /* 'a:' is the label */
    printf("\t %d",n);
    if(n>=100)
    {
        goto b;
    }
    goto a;
    b: printf("\n End of the program"); /* 'b' label */
    getch();
}
```

## OUTPUT:



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
1      2      3      4      5      6      7      8      9
10     11     12     13     14     15     16     17     18     19
20     21     22     23     24     25     26     27     28     29
30     31     32     33     34     35     36     37     38     39
40     41     42     43     44     45     46     47     48     49
50     51     52     53     54     55     56     57     58     59
60     61     62     63     64     65     66     67     68     69
70     71     72     73     74     75     76     77     78     79
80     81     82     83     84     85     86     87     88     89
90     91     92     93     94     95     96     97     98     99
100
End of the program
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 8

### AIM:

Program to comment on a particular grade using switch statement.

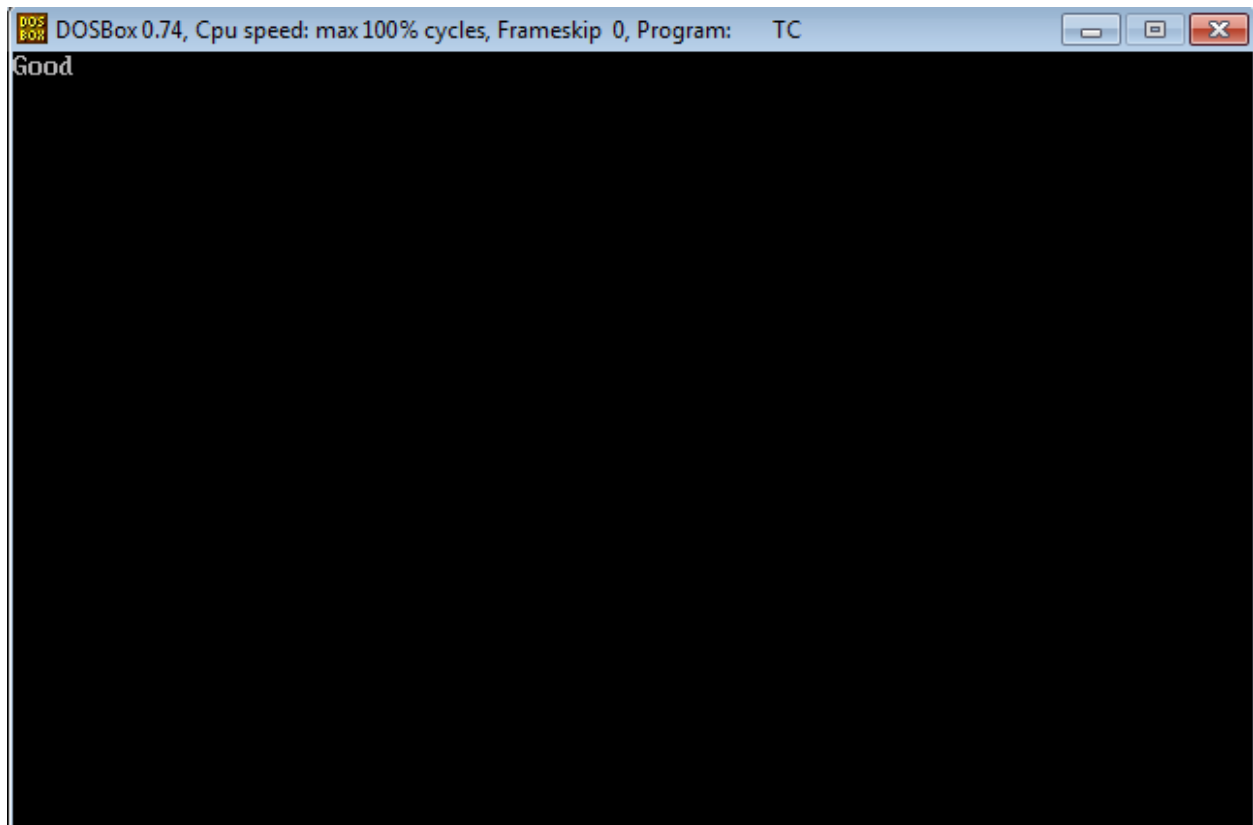
### OBJECTIVE:

To illustrate the use of switch statement.

### PROGRAM:

```
#include <stdio.h>
#include <conio.h>
void main( )
{
    int Grade = 'B';
    clrscr( );
    switch( Grade )
    {
        case 'A' : printf( "Excellent\n" );
                    break;
        case 'B' : printf( "Good\n" );
                    break;
        case 'C' : printf( "OK\n" );
                    break;
        case 'D' : printf( "Mmmmm....\n" );
                    break;
        case 'F' : printf( "You must do better than this\n" );
                    break;
        default : printf( "What is your grade anyway?\n" );
                    break;
    }
    getch( );
}
```

## OUTPUT:



## RESULT:

The program is executed successfully.

## EXPERIMENT: 9

### AIM:

Program to print following pattern.

```
*  
**  
***  
****  
*****
```

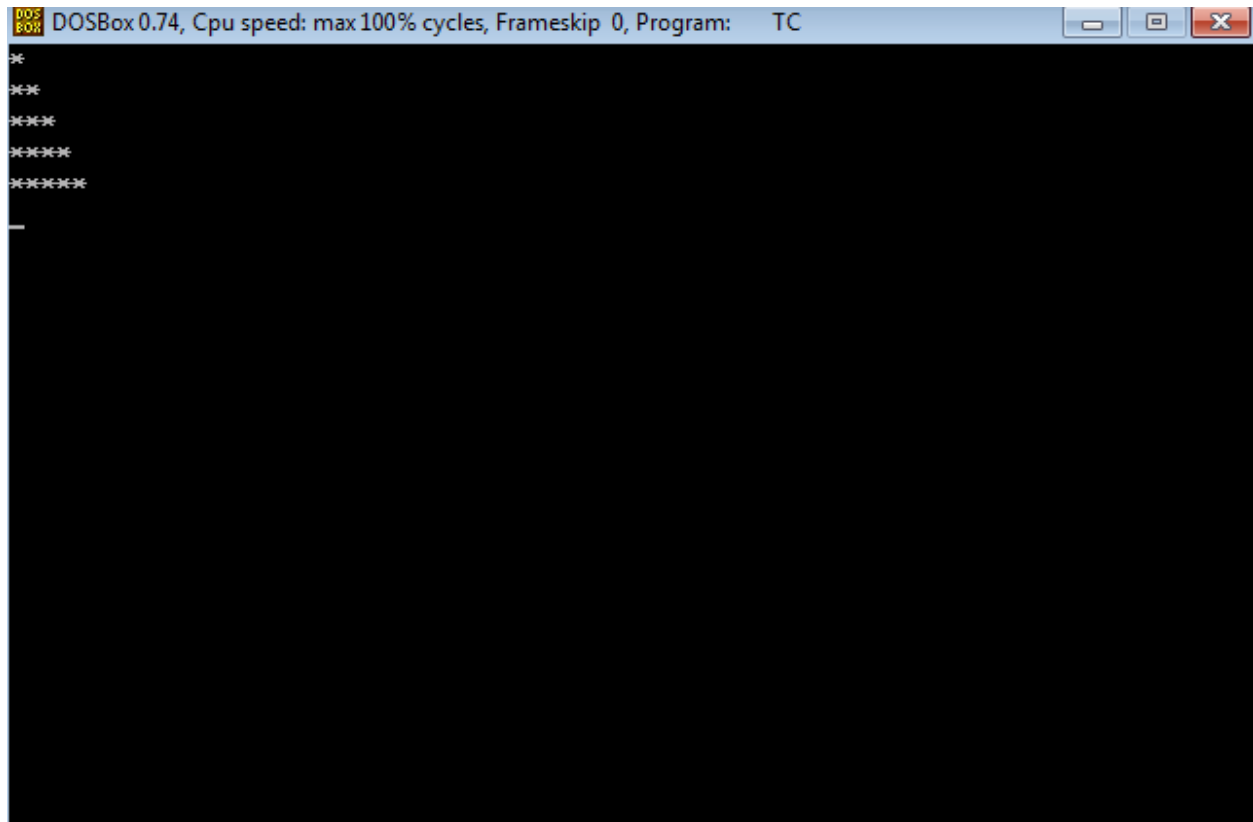
### OBJECTIVE:

Printing pattern using for loop.

### PROGRAM:

```
#include<stdio.h>  
#include<conio.h>  
void main( )  
{  
    int i,j;  
    clrscr( );  
    for(i=1;i<=5;i++)  
    {  
        for(j=1;j<=i;j++)  
        {  
            printf("*");  
        }  
        printf("\n");  
    }  
    getch( );  
}
```

## OUTPUT:



## RESULT:

The program is executed successfully.



## EXPERIMENT: 10

### AIM:

Program to print following pattern.

```
  *
 ***
*****
*****
*****
```

### OBJECTIVE:

Printing pattern using for loop.

### PROGRAM:

```
#include <stdio.h>
#include<conio.h>
void main( )
{
    int i,space,rows,k=0;
    clrscr( );
    printf("Enter the number of rows: ");
    scanf("%d",&rows);
    for(i=1;i<=rows;++i)
    {
        for(space=1;space<=rows-i;++space)
        {
            printf(" ");
        }
        while(k!=2*i-1)
        {
            printf("* ");
            ++k;
        }
        k=0;
        printf("\n");
    }
    getch( );
}
```

## OUTPUT:



```
TC.EXE
Enter the number of rows: 4
  *
 * * *
* * * * *
* * * * * * *
```

The screenshot shows a window titled 'TC.EXE' with a black background. The text 'Enter the number of rows: 4' is displayed at the top left. Below this, a pattern of asterisks is printed, consisting of four rows: the first row has one asterisk, the second has three, the third has five, and the fourth has seven. The window has standard Windows controls (minimize, maximize, close) in the top right corner.

## RESULT:

The program is executed successfully.

## EXPERIMENT: 11

### AIM:

Program to print following pattern.

```
1
21
321
4321
54321
```

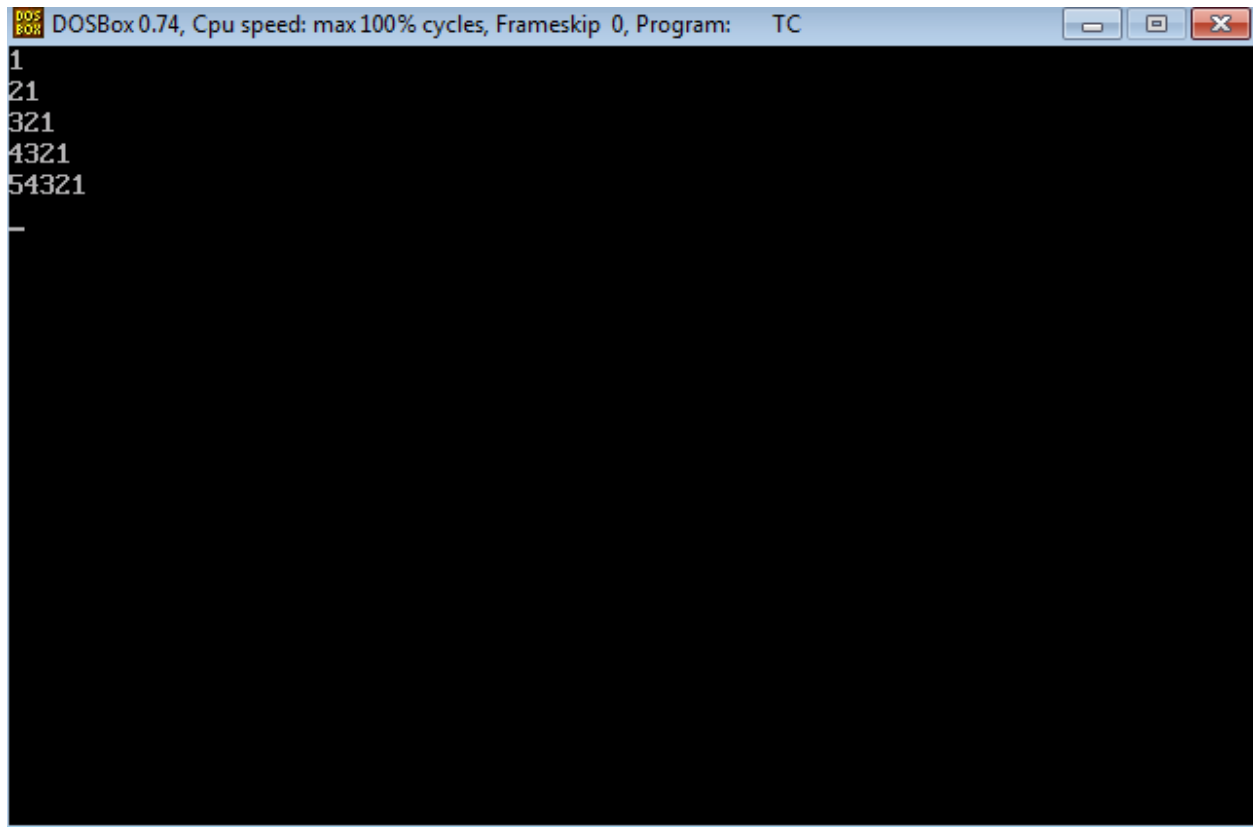
### OBJECTIVE:

Printing pattern using for loop.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    int i,j;
    clrscr( );
    for(i=1;i<=5;i++)
    {
        for(j=i;j>=1;j--)
        {
            printf("%d",j);
        }
        printf("\n");
    }
    getch( );
}
```

## OUTPUT:



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
1
21
321
4321
54321

```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 12

### AIM:

Program to printf following pattern.

```
A
BB
CCC
DDDD
EEEE
```

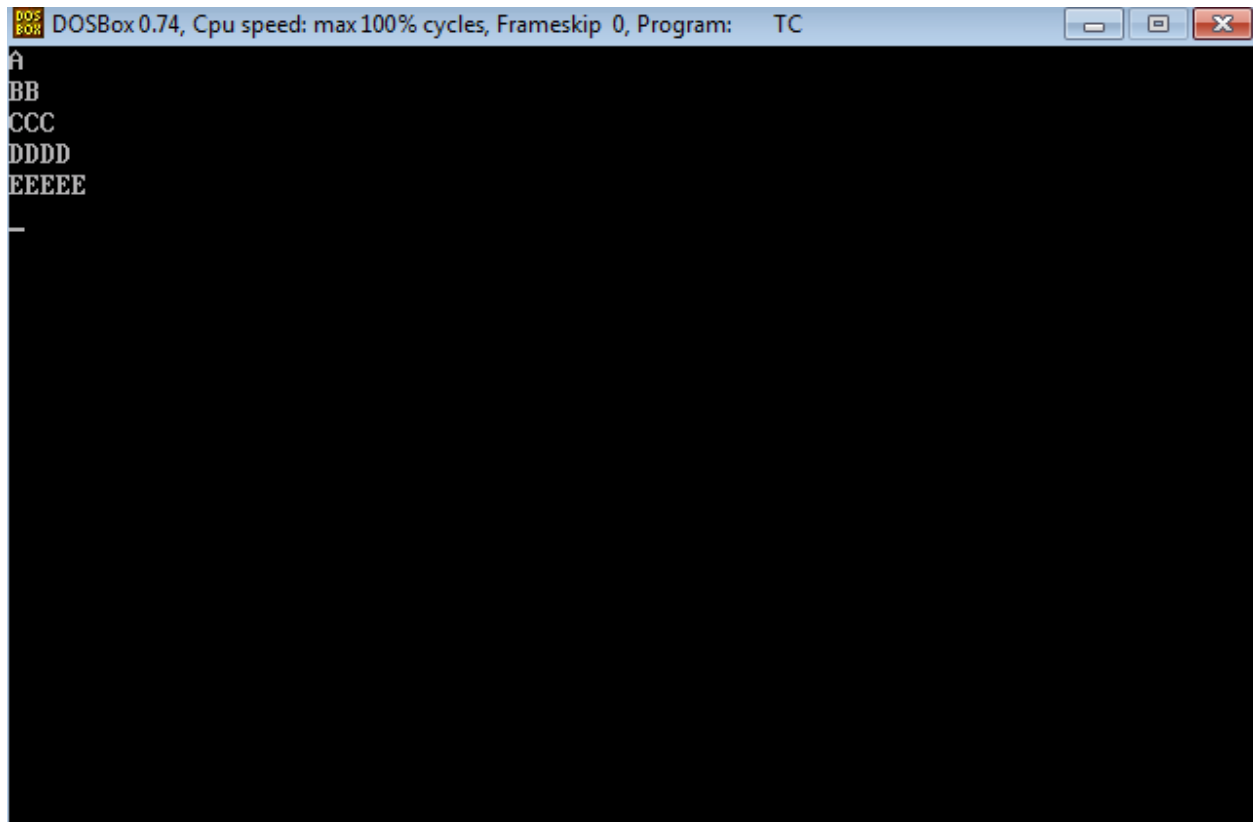
### OBJECTIVE:

Printing pattern using for loop.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    int i,j;
    clrscr( );
    for(i=0;i<=4;i++)
    {
        for(j=0;j<=i;j++)
        {
            printf("%c",'A'+i);
        }
        printf("\n");
    }
    getch( );
}
```

## OUTPUT:

A screenshot of a DOSBox 0.74 window. The title bar reads "DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC". The window contains a black terminal area with white text. The text displayed is: A, BB, CCC, DDDD, EEEEE, followed by a blank line and a cursor. The DOSBox logo is visible in the top-left corner of the window.

```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
A
BB
CCC
DDDD
EEEE

```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 13

### AIM:

Program to find sum of n natural number.

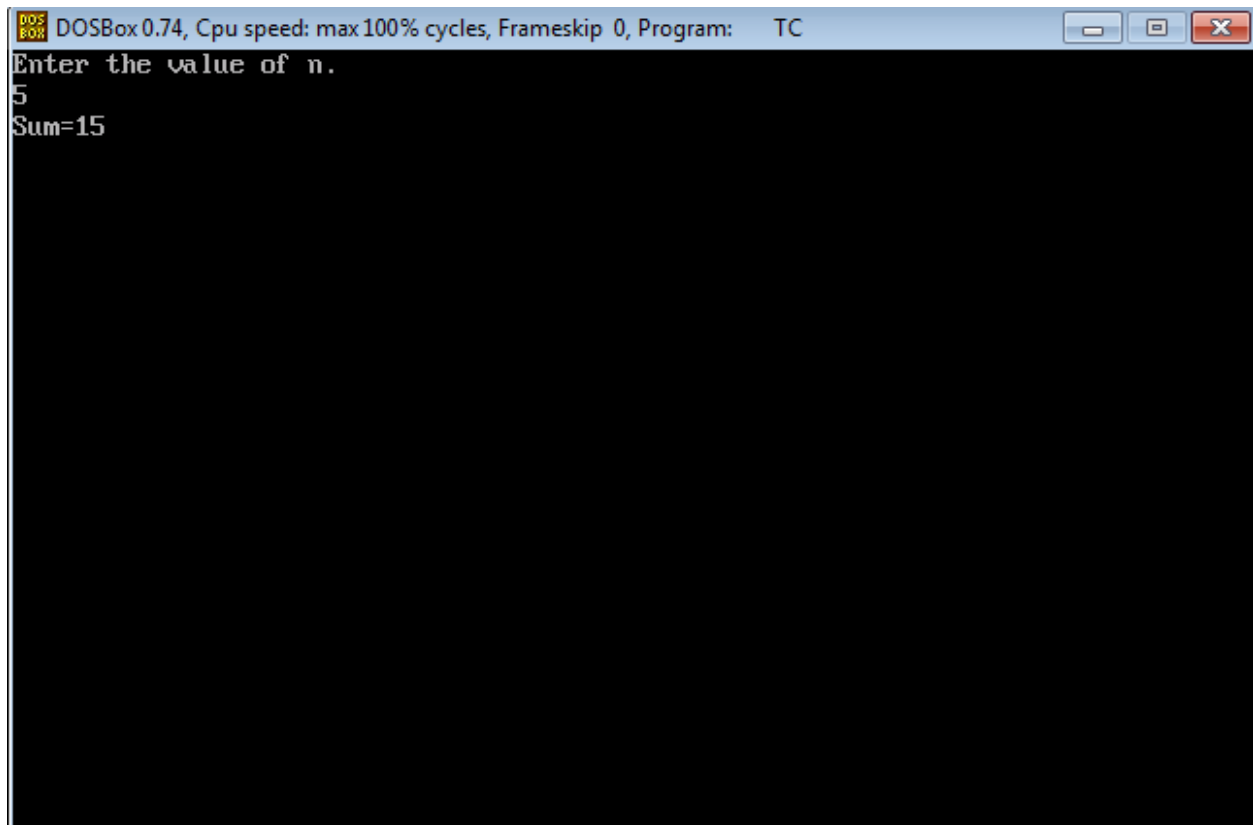
### OBJECTIVE:

To illustrate use of for statement.

### PROGRAM:

```
#include <stdio.h>
#include <conio.h>
void main( )
{
    int n, count, sum=0;
    clrscr( );
    printf("Enter the value of n.\n");
    scanf("%d",&n);
    for(count=1;count<=n;++count)
    {
        sum+=count;
    }
    printf("Sum=%d",sum);
    getch( );
}
```

## OUTPUT:

A screenshot of a DOSBox window. The title bar reads "DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC". The window contains a black background with white text. The text reads: "Enter the value of n.", followed by "5" on the next line, and "Sum=15" on the third line.

```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
Enter the value of n.
5
Sum=15
```

## RESULT:

The program is executed successfully.



## EXPERIMENT: 14

### AIM:

Write a program to generate fibonacci series.

### OBJECTIVE:

To illustrate use of for statement.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    int a,b,sum,i,n;
    clrscr( );
    a=0;
    b=1;
    printf("\n enter the limit of series ",&n);
    scanf("%d",&n);
    printf("\n fibonacci series \n ");
    printf("\t %d \t %d",a,b);
    for(i=0;i<n;i++)
    {
        sum=a+b;
        a=b;
        b=sum;
        printf("\t %d",sum);
    }
    getch( );
}
```

## OUTPUT:



The screenshot shows a Turbo C++ IDE window with a black background and white text. The text displays the prompt "enter the limit of series 7" and the output "fibonacci series" followed by the sequence of numbers: 0, 1, 1, 2, 3, 5, 8, 13, and 21. The numbers are aligned under their respective indices from 0 to 7.

```
enter the limit of series 7
fibonacci series
0      1      1      2      3      5      8      13      21_
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 15

### AIM:

Program to illustrate use of do...while statement.

### OBJECTIVE:

To illustrate use of do..while statement.

### PROGRAM:

//The program adds all the number entered by user untill user enters 0.

```
#include<stdio.h>
```

```
#include<conio.h>
```

```
void main()
```

```
{
```

```
    int sum=0,num;
```

```
    clrscr();
```

```
    do
```

```
    {
```

```
        printf("Enter a number\n");
```

```
        scanf("%d",&num);
```

```
        sum+=num;
```

```
    }
```

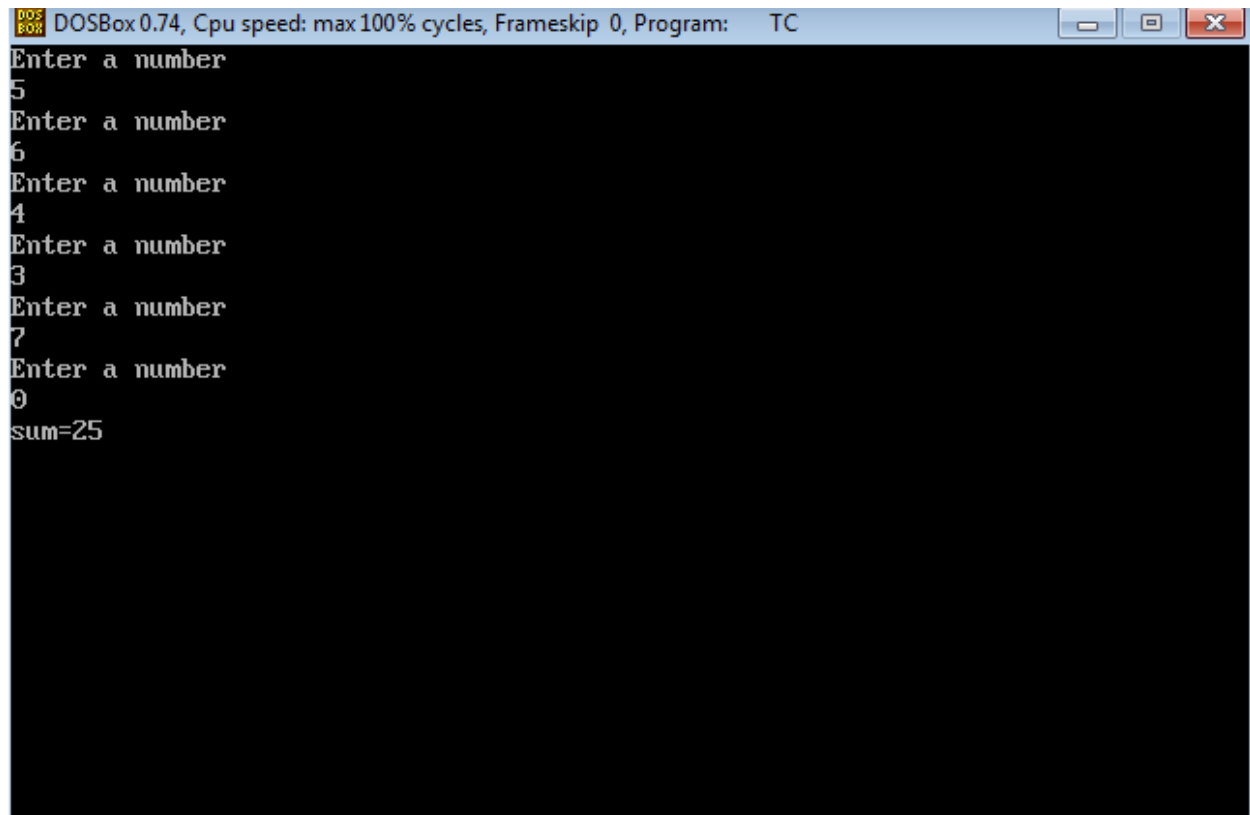
```
    while(num!=0);
```

```
    printf("sum=%d",sum);
```

```
    getch();
```

```
}
```

**OUTPUT:**



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
Enter a number
5
Enter a number
6
Enter a number
4
Enter a number
3
Enter a number
7
Enter a number
0
sum=25
```

**RESULT:**

The program is executed successfully.

## EXPERIMENT: 16

### AIM:

Write a program to find whether the number is palindrome or not.

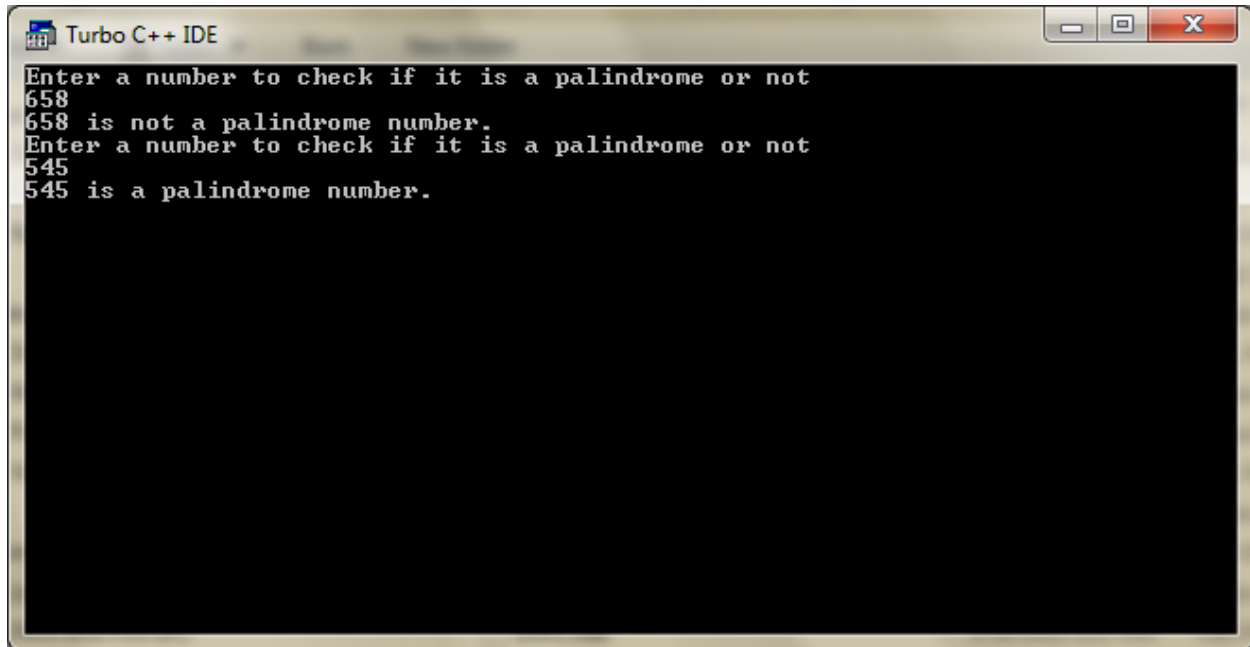
### OBJECTIVE:

To illustrate the use of while statement.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr( );
    int n, reverse = 0, temp;
    printf("Enter a number to check if it is a palindrome or not\n");
    scanf("%d",&n);
    temp = n;
    while(temp != 0)
    {
        reverse = reverse * 10;
        reverse = reverse + temp%10;
        temp = temp/10;
    }
    if (n== reverse)
        printf("%d is a palindrome number.\n", n);
    else
        printf("%d is not a palindrome number.\n", n);
    getch( );
}
```

## OUTPUT:



```
Turbo C++ IDE
Enter a number to check if it is a palindrome or not
658
658 is not a palindrome number.
Enter a number to check if it is a palindrome or not
545
545 is a palindrome number.
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 17

### AIM:

Program for addition of matrices.

### OBJECTIVE:

To perform function in arrays.

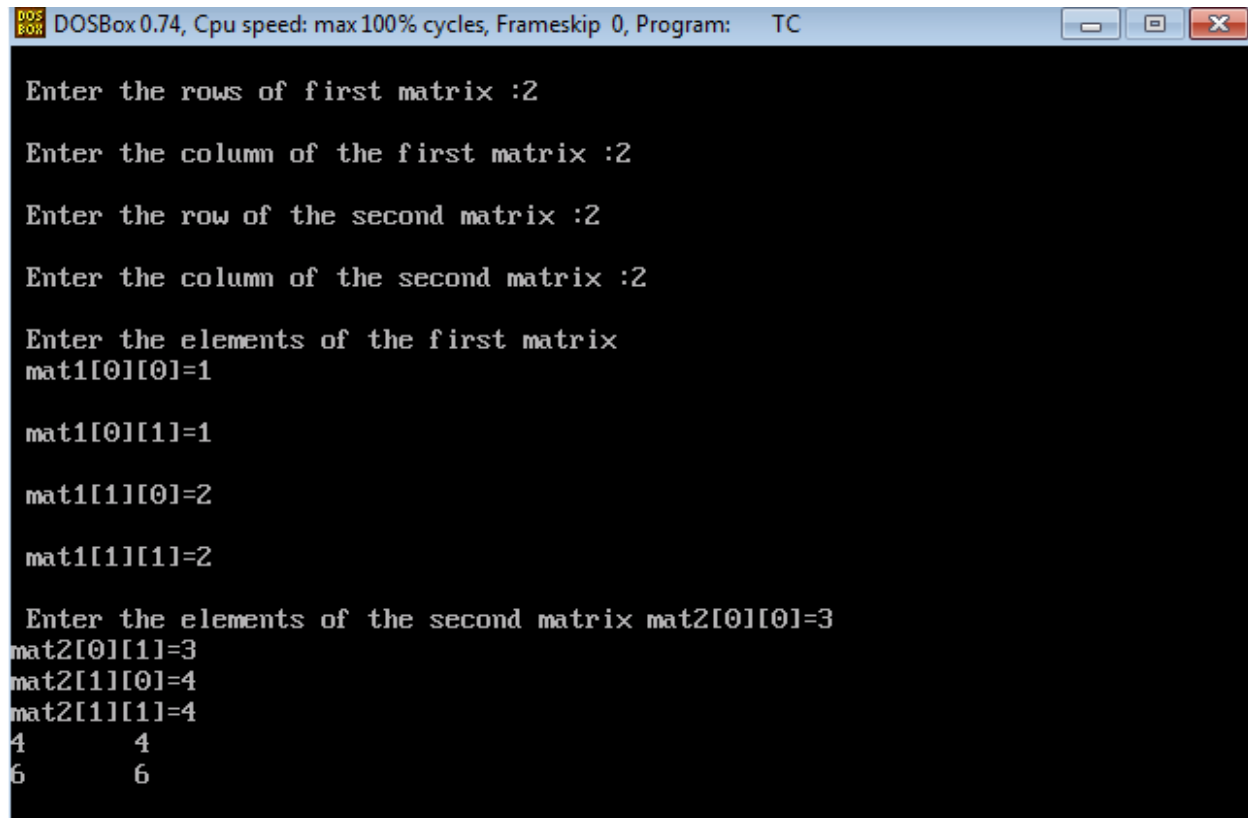
### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i,j,mat1[10][10],mat2[10][10],mat3[10][10];
int row1,col1,row2,col2;
clrscr();
printf("\n Enter the rows of first matrix :");
scanf("%d",&row1);
printf("\n Enter the column of the first matrix :");
scanf("%d",&col1);
printf("\n Enter the row of the second matrix :");
scanf("%d",&row2);
printf("\n Enter the column of the second matrix :");
scanf("%d",&col2);
printf("\n Enter the elements of the first matrix");
for(i=0;i<row1;i++)
{
for(j=0;j<col1;j++)
{
printf("\n mat1[%d][%d]=",i,j);
scanf("%d",&mat1[i][j]);
}
}
printf("\n Enter the elements of the second matrix ");
for(i=0;i<row2;i++)
{
for(j=0;j<col2;j++)
{
printf("mat2[%d][%d]=",i,j);
scanf("%d",&mat2[i][j]);
}
}
/* Sum */
```

```
for(i=0;i<row1;i++)
{
for(j=0;j<col1;j++)
{
mat3[i][j]=mat1[i][j]+mat2[i][j];
}
}
/* Output */
for(i=0;i<row1;i++)
{
for(j=0;j<col1;j++)
{
printf("%d\t",mat3[i][j]);
}
printf("\n");
}
getch();
}
```



## OUTPUT:



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC

Enter the rows of first matrix :2
Enter the column of the first matrix :2
Enter the row of the second matrix :2
Enter the column of the second matrix :2
Enter the elements of the first matrix
mat1[0][0]=1
mat1[0][1]=1
mat1[1][0]=2
mat1[1][1]=2
Enter the elements of the second matrix mat2[0][0]=3
mat2[0][1]=3
mat2[1][0]=4
mat2[1][1]=4
4      4
6      6
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 18

### AIM:

Program for multiplication of matrices.

### OBJECTIVE:

To perform functions in arrays.

### PROGRAM:

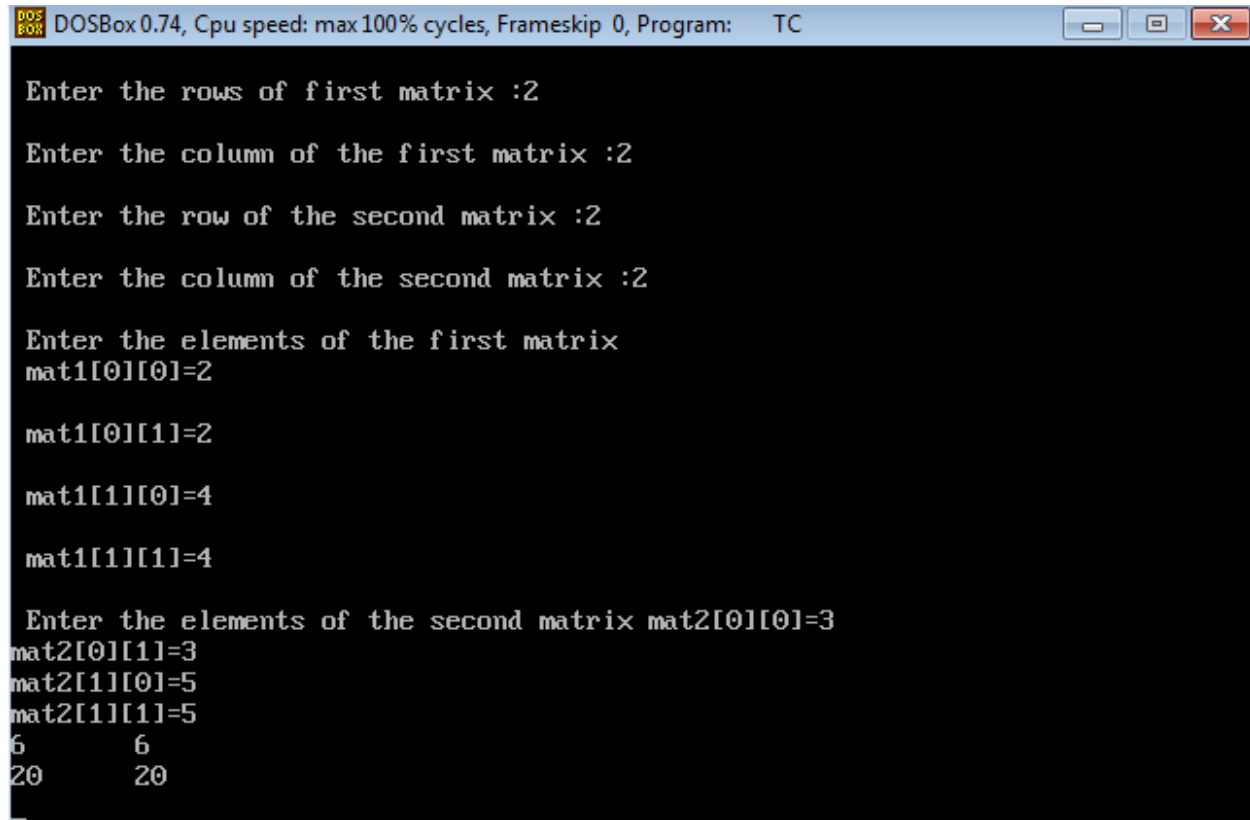
```
#include<stdio.h>
#include<conio.h>
void main()
{
int i,j,k,mat1[10][10],mat2[10][10],mat3[10][10];
int row1,col1,row2,col2;
int sum=0;
clrscr();
printf("\n Enter the rows of first matrix :");
scanf("%d",&row1);
printf("\n Enter the column of the first matrix :");
scanf("%d",&col1);
printf("\n Enter the row of the second matrix :");
scanf("%d",&row2);
printf("\n Enter the column of the second matrix :");
scanf("%d",&col2);
printf("\n Enter the elements of the first matrix");
for(i=0;i<row1;i++)
{
for(j=0;j<col1;j++)
{
printf("\n mat1[%d][%d]=",i,j);
scanf("%d",&mat1[i][j]);
}
}
printf("\n Enter the elements of the second matrix ");
for(i=0;i<row2;i++)
{
for(j=0;j<col2;j++)
{
printf("mat2[%d][%d]=",i,j);
scanf("%d",&mat2[i][j]);
}
}
```

```

}
/* Multiplication*/
for(i=0;i<row1;i++)
{
for(j=0;j<col2;j++)
{
for(k=0;k<row2;k++)
{
sum=sum+(mat1[i][j]*mat2[i][j]);
}
mat3[i][j]=sum;
sum=0;
}
}
/* Output */
for(i=0;i<row1;i++)
{
for(j=0;j<col2;j++)
{
printf("%d\t",mat3[i][j]);
}
printf("\n");
}
getch();
}

```

## OUTPUT:



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC

Enter the rows of first matrix :2
Enter the column of the first matrix :2
Enter the row of the second matrix :2
Enter the column of the second matrix :2
Enter the elements of the first matrix
mat1[0][0]=2
mat1[0][1]=2
mat1[1][0]=4
mat1[1][1]=4
Enter the elements of the second matrix mat2[0][0]=3
mat2[0][1]=3
mat2[1][0]=5
mat2[1][1]=5
6      6
20     20
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 19

### AIM:

Program for implementation of 2-D arrays.

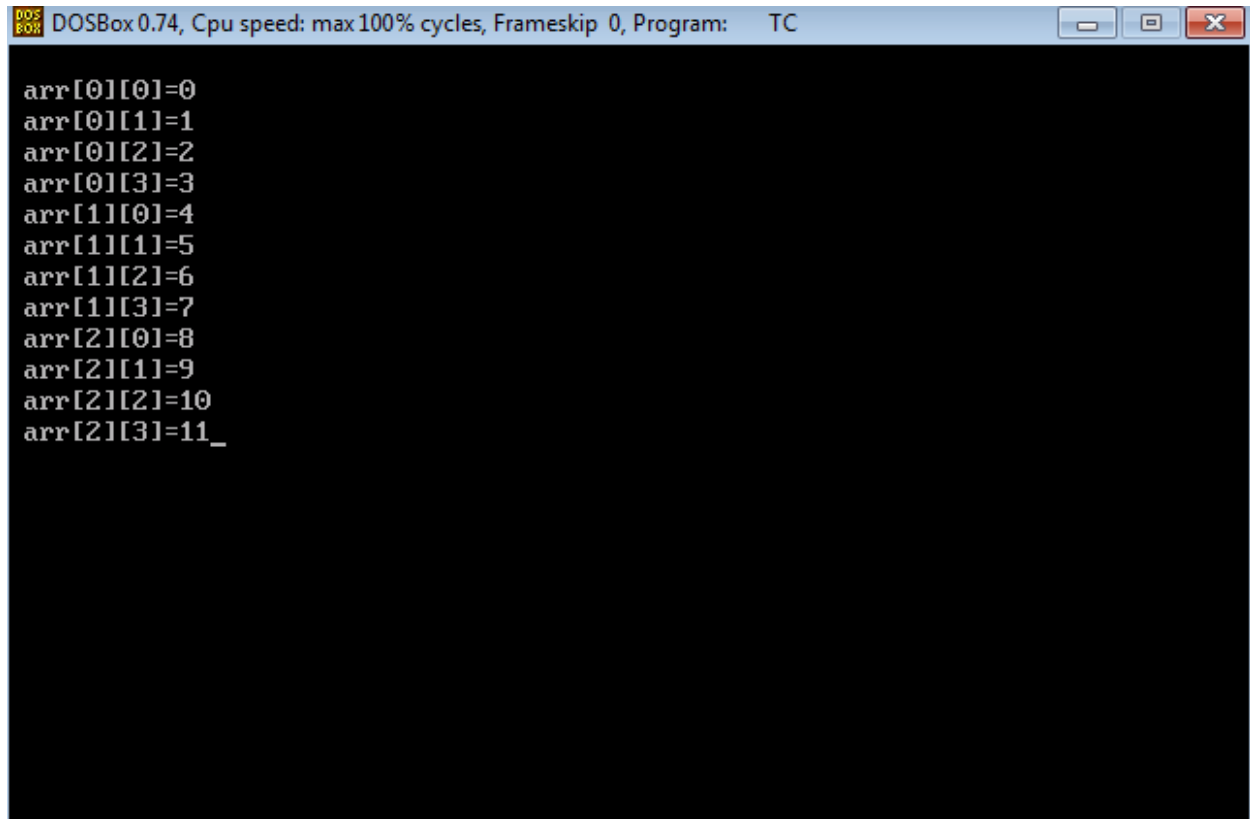
### OBJECTIVE:

To illustrate about 2-D array.

### PROGRAM:

```
#include <stdio.h>
#include <conio.h>
void main( )
{
    int i,j;
    int arr[3][4]={
        {0,1,2,3},
        {4,5,6,7},
        {8,9,10,11},
    };
    clrscr( );
    for(i=0;i<3;i++)
    {
        for(j=0;j<4;j++)
        {
            printf("\n arr[%d][%d]=%d",i,j,arr[i][j]);
        }
    }
    getch( );
}
```

## OUTPUT:



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
arr[0][0]=0
arr[0][1]=1
arr[0][2]=2
arr[0][3]=3
arr[1][0]=4
arr[1][1]=5
arr[1][2]=6
arr[1][3]=7
arr[2][0]=8
arr[2][1]=9
arr[2][2]=10
arr[2][3]=11_
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 20

### AIM:

Program to display the prime number between two intervals.

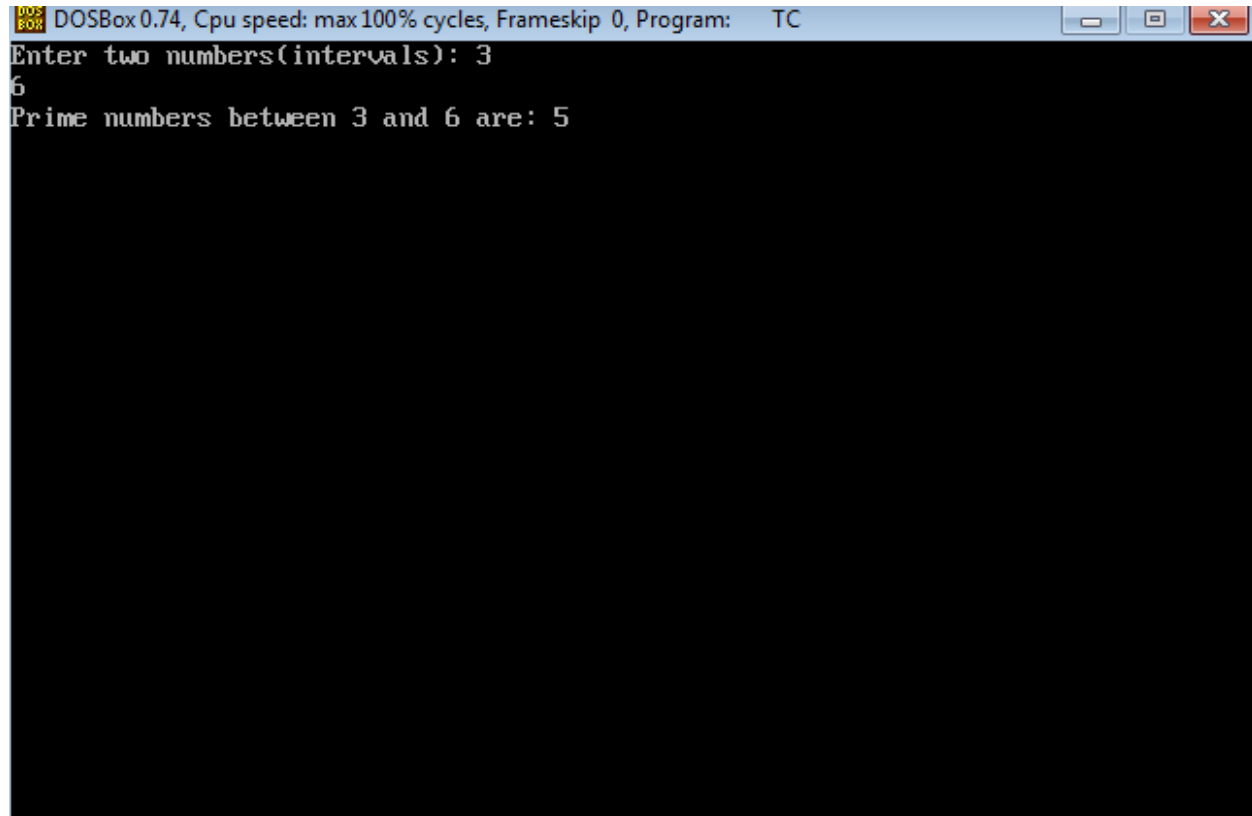
### OBJECTIVE:

To make a program using user defined function.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
int check_prime(int num);
void main( )
{
    int n1,n2,i,isPrime;
    printf("Enter two numbers(intervals): ");
    scanf("%d %d",&n1, &n2);
    printf("Prime numbers between %d and %d are: ", n1, n2);
    for(i=n1+1;i<n2;++i)
    {
        isPrime=check_prime(i);
        if(isPrime==0)
            printf("%d ",i);
    }
    getch( );
}
int check_prime(int num) /* User-defined function to check prime number*/
{
    int j,isPrime=0;
    for(j=2;j<=num/2;++j)
    {
        if(num%j==0)
        {
            isPrime=1;
            break;
        }
    }
    return isPrime;
}
```

## OUTPUT:

A screenshot of a DOSBox window. The title bar reads "DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC". The window contains a black terminal area with white text. The text shows a prompt "Enter two numbers(intervals):", the user input "3", a second prompt, the user input "6", and the final output "Prime numbers between 3 and 6 are: 5".

```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
Enter two numbers(intervals): 3
6
Prime numbers between 3 and 6 are: 5
```

## RESULT:

The program is executed successfully.



## EXPERIMENT: 21

### AIM:

Program to find sum of n number using recursion.

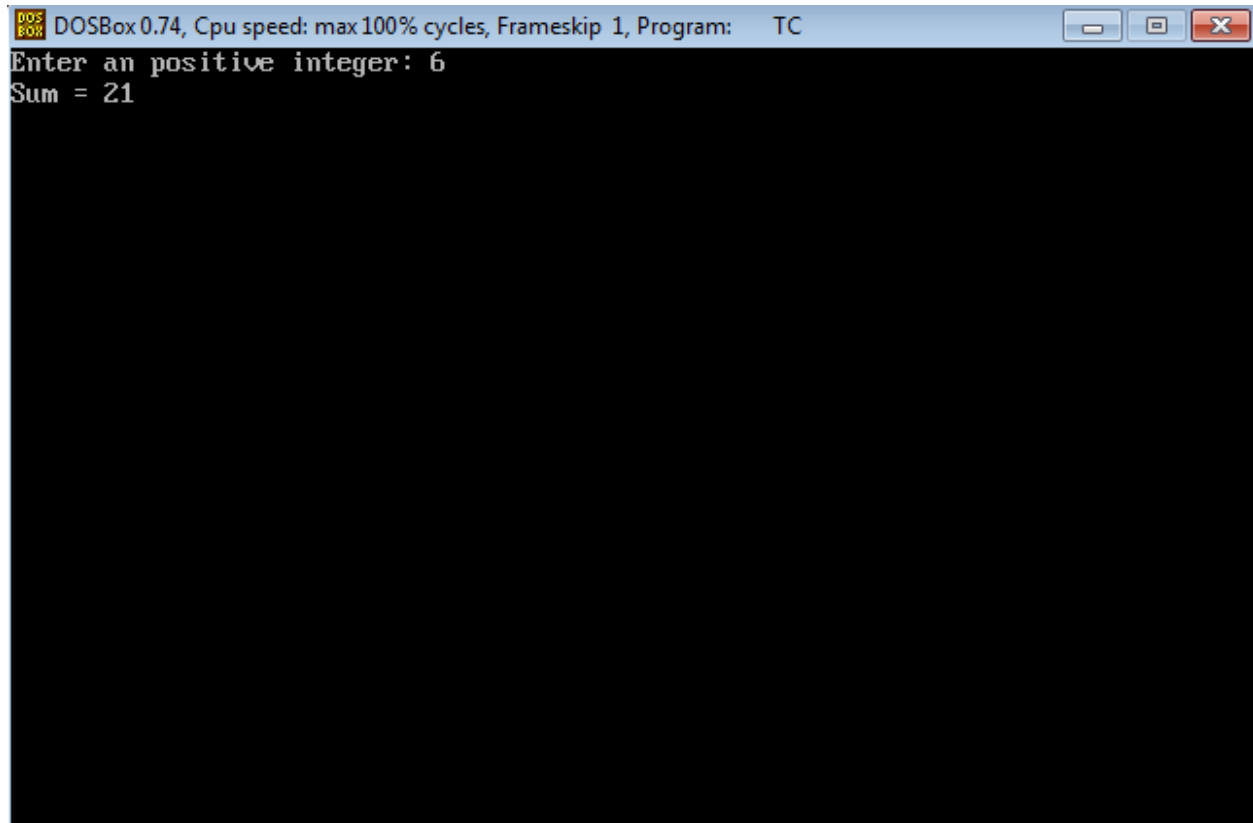
### OBJECTIVE:

To illustrate the use of recursion in program.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
int add(int n);
void main()
{
    int n;
    clrscr();
    printf("Enter an positive integer: ");
    scanf("%d",&n);
    printf("Sum = %d",add(n));
    getch();
}
int add(int n)
{
    if(n!=0)
        return n+add(n-1); /* recursive call */
}
```

## OUTPUT:

A screenshot of a DOSBox window. The title bar reads "DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 1, Program: TC". The window contains a black terminal area with white text. The text displayed is "Enter an positive integer: 6" on the first line and "Sum = 21" on the second line. The window has standard Windows-style minimize, maximize, and close buttons in the top right corner.

```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 1, Program: TC
Enter an positive integer: 6
Sum = 21
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 22

### AIM:

Program to find factorial of a number using recursion.

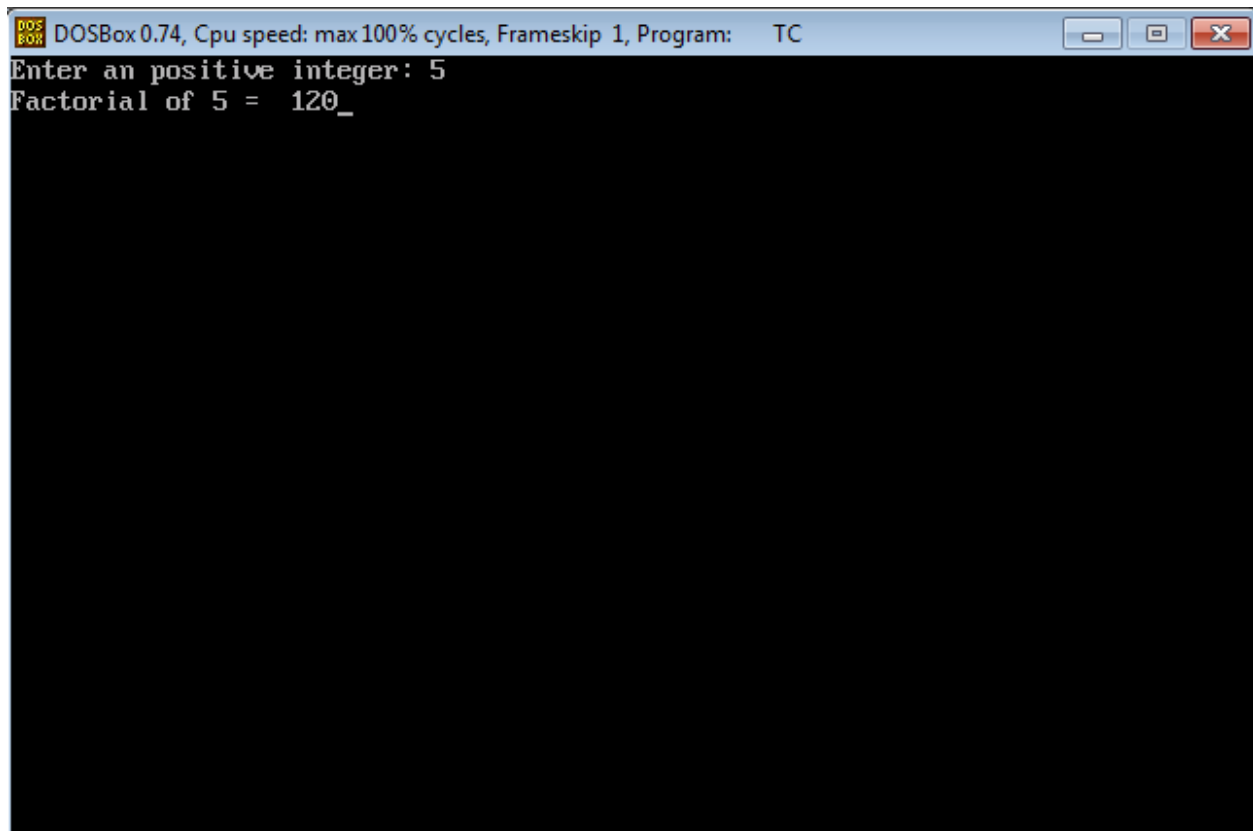
### OBJECTIVE:

To illustrate the use of recursion in a program.

### PROGRAM:

```
#include<stdio.h>
#include<conio.h>
int factorial(int n);
void main()
{
    int n;
    clrscr();
    printf("Enter an positive integer: ");
    scanf("%d",&n);
    printf("Factorial of %d = %ld", n, factorial(n));
    getch();
}
int factorial(int n)
{
    if(n!=1)
        return n*factorial(n-1);
}
```

## OUTPUT:

A screenshot of a DOSBox 0.74 window. The title bar reads "DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 1, Program: TC". The window contains a black terminal area with white text. The text shows a prompt "Enter an positive integer: 5" followed by the output "Factorial of 5 = 120\_".

```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 1, Program: TC
Enter an positive integer: 5
Factorial of 5 = 120_
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 23

### AIM:

Program to find H.C.F of two numbers using recursion.

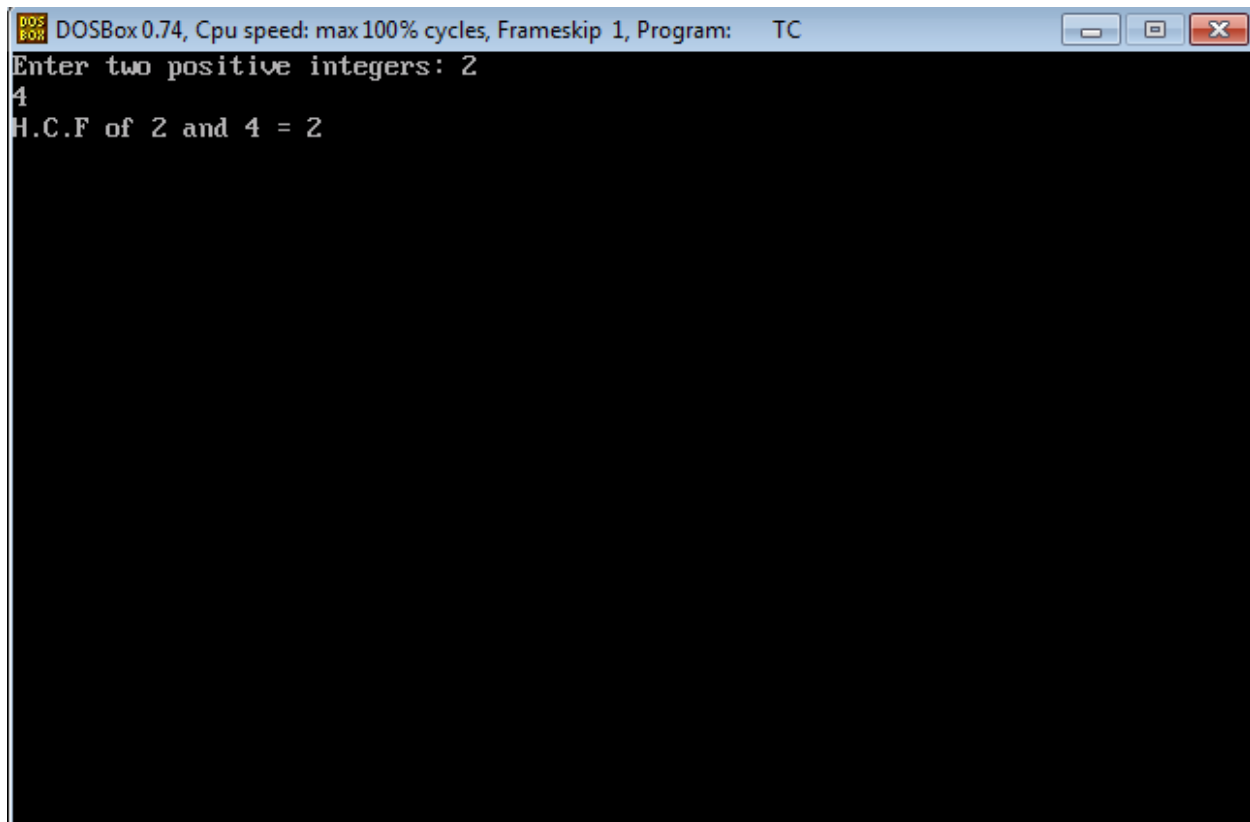
### OBJECTIVE:

To illustrate the use of recursion in a program.

### PROGRAM:

```
#include <stdio.h>
#include <conio.h>
int hcf(int n1, int n2);
void main()
{
    int n1, n2;
    clrscr();
    printf("Enter two positive integers: ");
    scanf("%d%d", &n1, &n2);
    printf("H.C.F of %d and %d = %d", n1, n2, hcf(n1,n2));
    getch();
}
int hcf(int n1, int n2)
{
    if (n2!=0)
        return hcf(n2, n1%n2);
    else
        return n1;
}
```

## OUTPUT:

A screenshot of a DOSBox window. The title bar reads "DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 1, Program: TC". The window contains a black background with white text. The text reads: "Enter two positive integers: 2", "4", and "H.C.F of 2 and 4 = 2".

```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 1, Program: TC
Enter two positive integers: 2
4
H.C.F of 2 and 4 = 2
```

## RESULT:

The program is executed successfully.

## EXPERIMENT: 24

### AIM:

Write a program to demonstrate working of pointers.

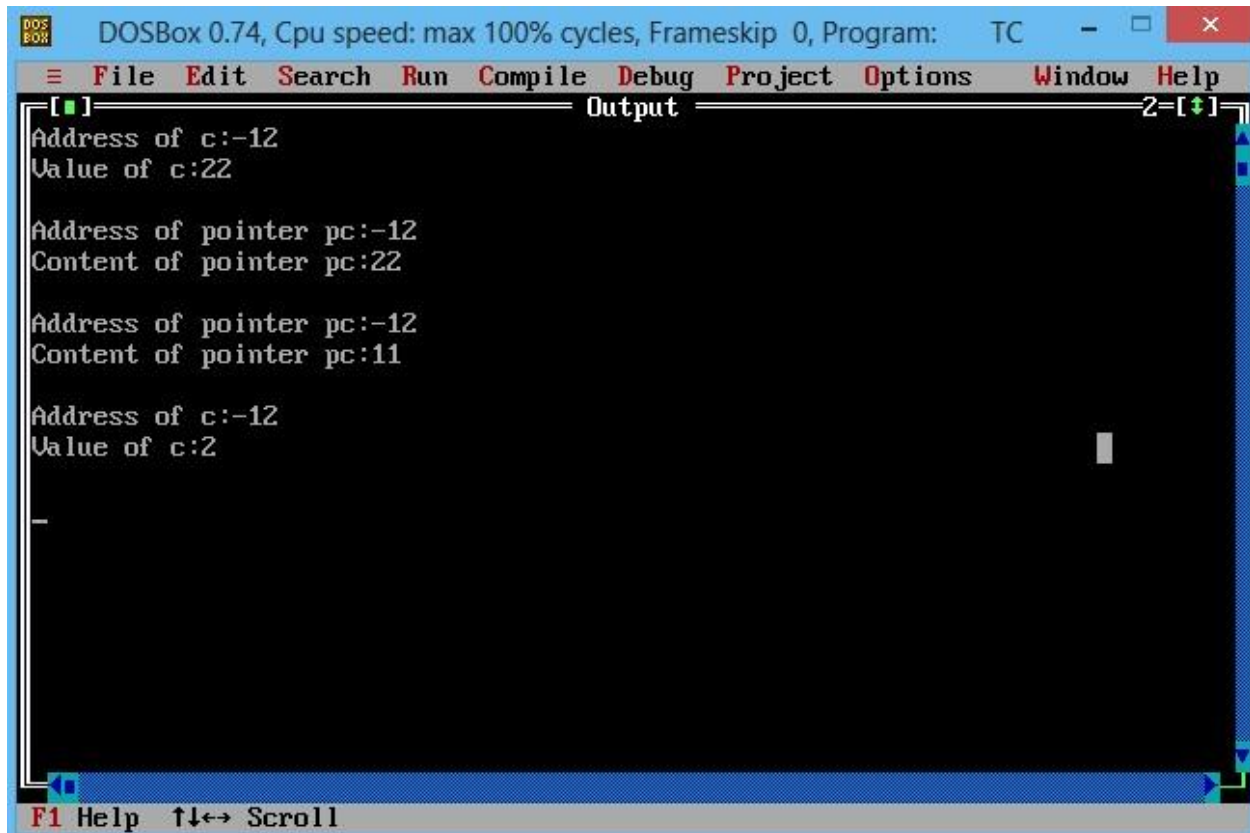
### OBJECTIVE:

To know about basic pointers operations.

### PROGRAM:

```
#include <stdio.h>
#include <conio.h>
void main( )
{
    int *pc;
    int c;
    c=22;
    clrscr( );
    printf("Address of c:%d\n",&c);
    printf("Value of c:%d\n\n",c);
    pc=&c;
    printf("Address of pointer pc:%d\n",pc);
    printf("Content of pointer pc:%d\n\n",*pc);
    c=11;
    printf("Address of pointer pc:%d\n",pc);
    printf("Content of pointer pc:%d\n\n",*pc);
    *pc=2;
    printf("Address of c:%d\n",&c);
    printf("Value of c:%d\n\n",c);
    getch( );
}
```

## OUTPUT:



The screenshot shows the DOSBox 0.74 interface with the 'Output' window active. The window title bar reads 'DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC'. The menu bar includes 'File', 'Edit', 'Search', 'Run', 'Compile', 'Debug', 'Project', 'Options', 'Window', and 'Help'. The output text is as follows:

```
[■] Output 2=[+]  
Address of c:-12  
Value of c:22  
  
Address of pointer pc:-12  
Content of pointer pc:22  
  
Address of pointer pc:-12  
Content of pointer pc:11  
  
Address of c:-12  
Value of c:2  
  
-  
  
F1 Help ↑↓↔ Scroll
```

## RESULT:

The program is executed successfully.



## EXPERIMENT: 25

### AIM:

Write a program to access elements of an array using pointers.

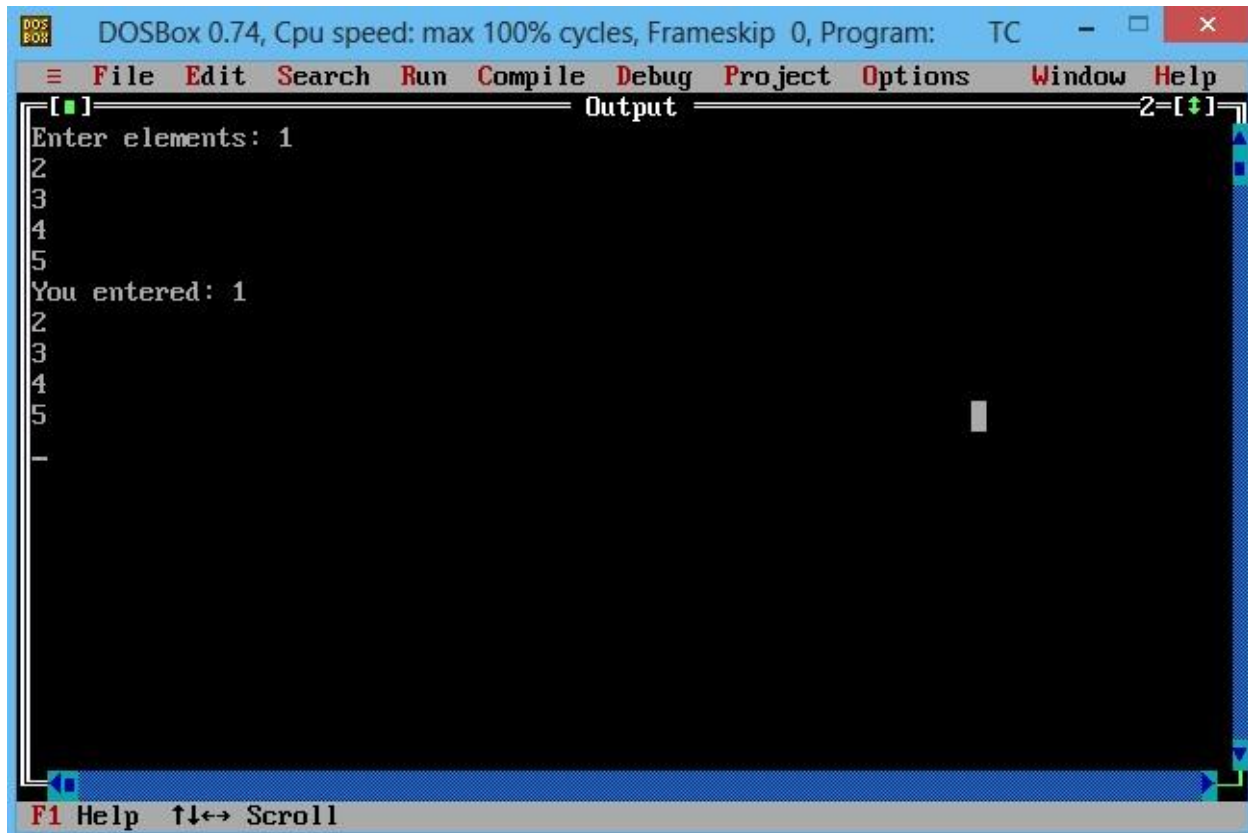
### OBJECTIVE:

To illustrate the use of the pointers in the arrays.

### PROGRAM:

```
#include <stdio.h>
#include <conio.h>
void main( )
{
    int data[5], i;
    clrscr( );
    printf("Enter elements: ");
    for(i=0;i<5;++i)
        scanf("%d",data+i);
    printf("You entered: ");
    for(i=0;i<5;++i)
        printf("%d\n",*(data+i));
    getch( );
}
```

## OUTPUT:



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
File Edit Search Run Compile Debug Project Options Window Help
[ ] Output 2=[+ ]
Enter elements: 1
2
3
4
5
You entered: 1
2
3
4
5
-
F1 Help ↑↓↔ Scroll
```

## RESULT:

The program is executed successfully.