PSTC LAB PROGRAMS

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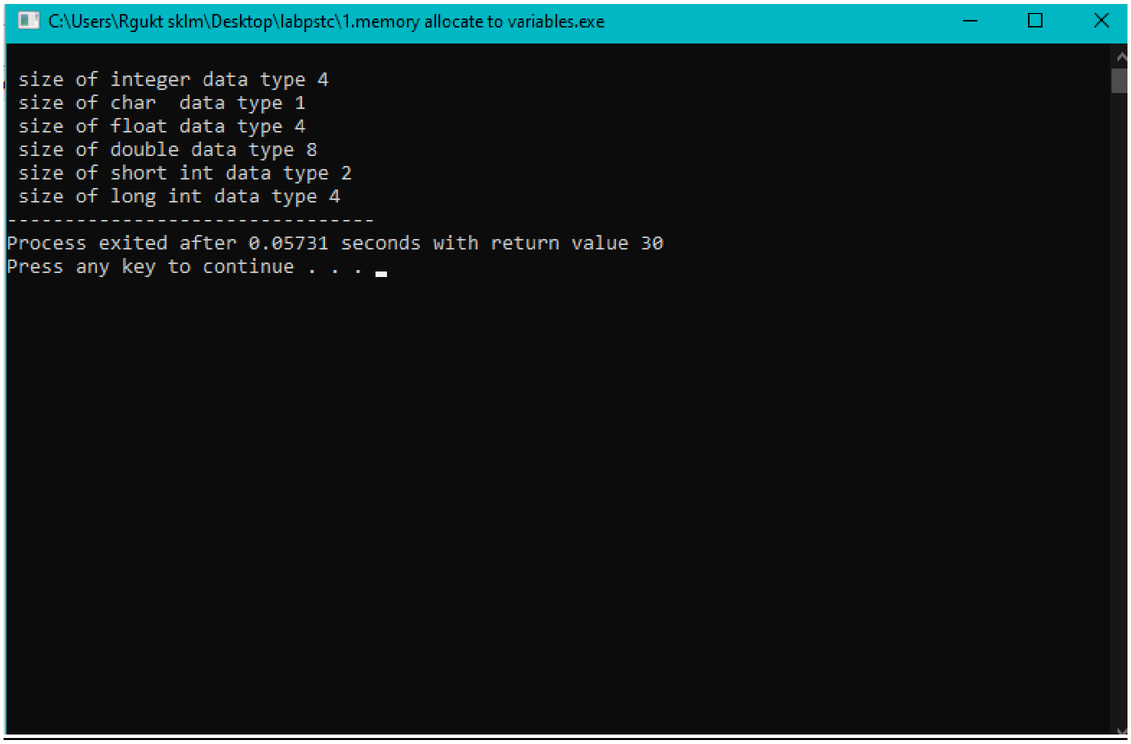
1.Write a program to print the memory allocation required for all the datatype in C Language

program:

```
#include<stdio.h>
int main()
{
	int a;
	char b;
	float c;
	double d;
	short int e;
	long int f;
	printf("\n size of integer data type %d",sizeof(a));
	printf("\n size of char    data type %d",sizeof(b));
	printf("\n size of float data type %d",sizeof(c));
	printf("\n size of double data type %d",sizeof(d));
	printf("\n size of short int data type %d",sizeof(e));
	printf("\n size of long int data type %d",sizeof(f));

}
```

output:

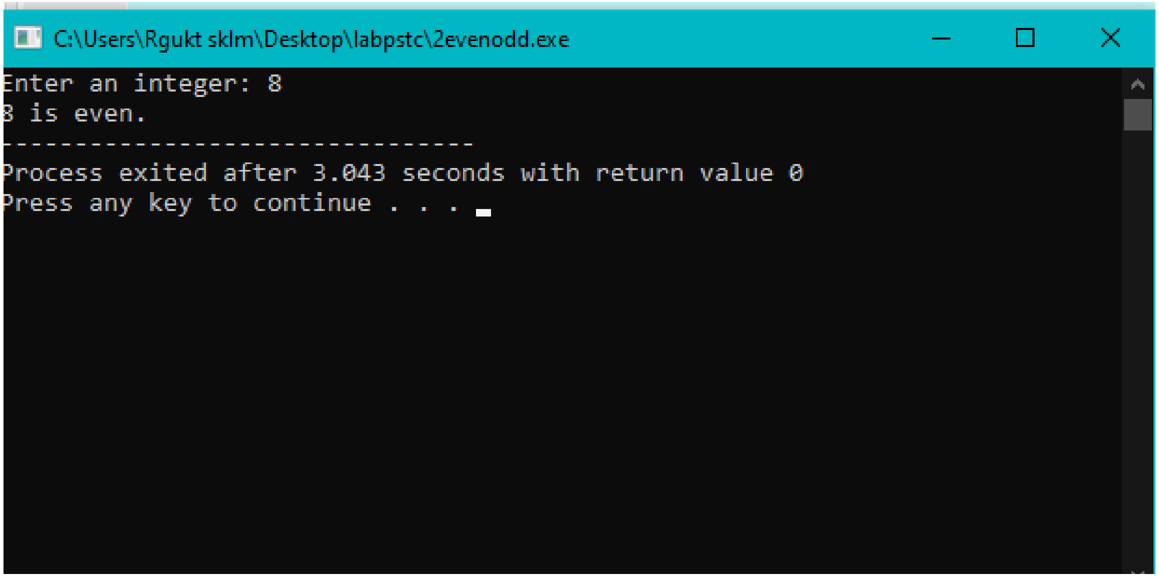

C:\Users\Rgukt sklm\Desktop\labpstc\1.memory allocate to variables.exe

```
 size of integer data type 4
 size of char  data type 1
 size of float data type 4
 size of double data type 8
 size of short int data type 2
 size of long int data type 4
--------------------------------
Process exited after 0.05731 seconds with return value 30
Press any key to continue . . .
```

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

program:

```
#include <stdio.h>

int main()

{

int num;

printf("Enter an integer: ");

scanf("%d", &num);

if(num % 2 == 0)

printf("%d is even.", num);

else

printf("%d is odd.", num);

return 0;

}
```



```
Enter an integer: 8
8 is even.
--------------------------------
Process exited after 3.043 seconds with return value 0
Press any key to continue . . .
```

3.Write a menu based program to take of input of two values followed input of choice and accordingly perform arithmetic operations like

Addition, Subtraction, Multiplication, Modulus, Division, Power(Using Switch Statement)

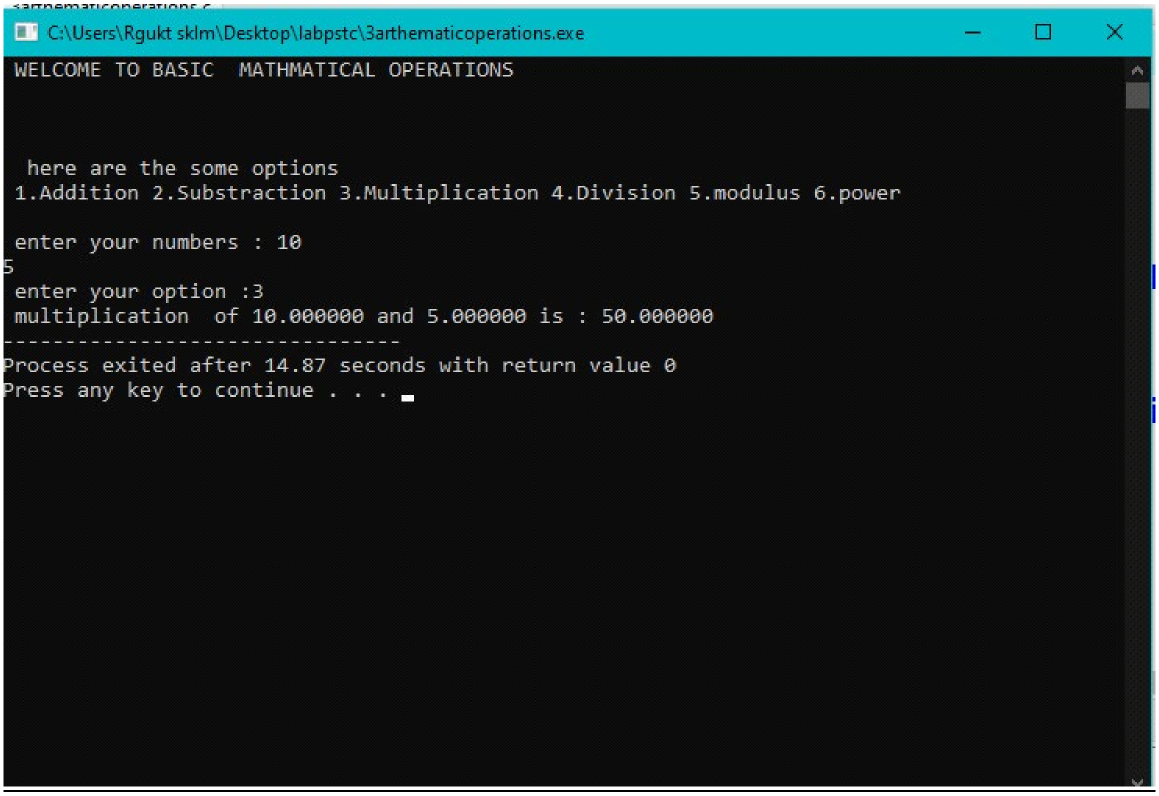
<u>program:</u>

```
#include<stdio.h>

int main()

{

        float a,b;

        int op;

        printf(" WELCOME TO BASIC    MATHMATICAL OPERATIONS");

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

        printf(" here are the some options \n");

        printf(" 1.Addition 2.Substraction 3.Multiplication 4.Division 5.modulus 6.power");

        printf(" \n \n");

        printf(" enter your numbers : ");

        scanf("%f %f",&a,&b);

        printf(" enter your option :");

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

```
    int x=a;

    int y=b;

    int pow=1;


switch(op)

{

    case 1:

        printf(" sum of the %f and %f is :%f ",a,b,a+b);

        break;

    case 2:

        printf(" substraction of %f and %f is :%f ",a,b,a-b);

        break;

    case 3:

        printf(" multiplication    of %f and %f is : %f",a,b,a*b);

        break;

    case 4:

        printf(" division of %f and %f is : %f",a,b,a/b);

        break;

    case 5:

        printf(" modulus of %f and %f is : %d",x,y,x%y);

        break;

    case 6:

    while(y){

           pow=pow*a;

           y--;

    }

    printf(" power is %d",pow);

    break;
```

```
                default:
                        printf("enter the correct option ");
                        break;
                }return(0);
}
```

<u>output:</u>


C:\Users\Rgukt sklm\Desktop\labpstc\3arthematicoperations.exe

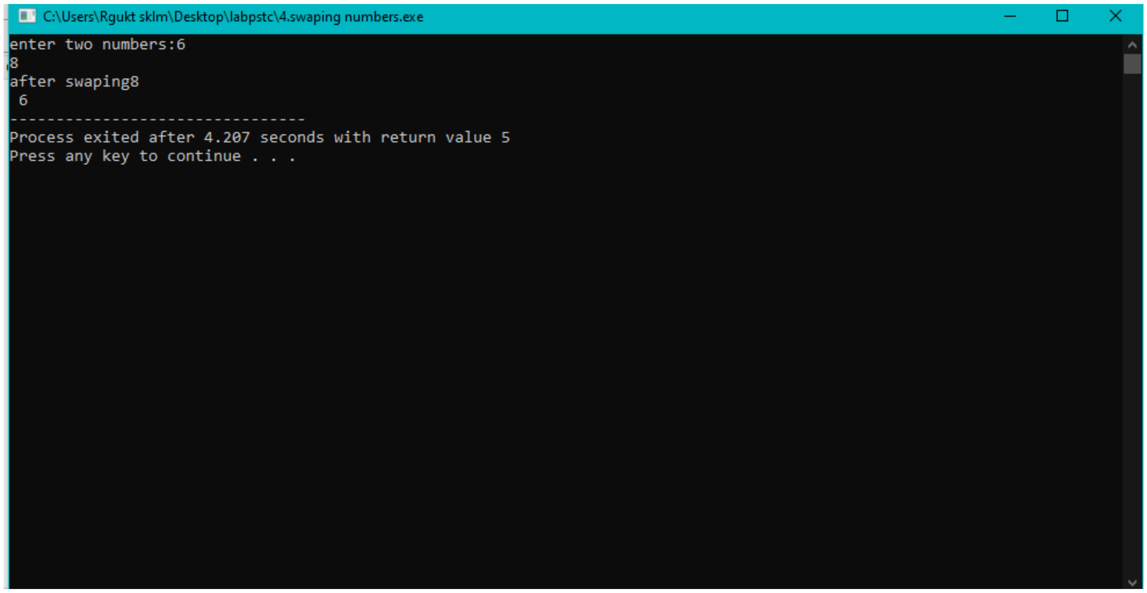
```
 WELCOME TO BASIC  MATHMATICAL OPERATIONS



  here are the some options
 1.Addition 2.Substraction 3.Multiplication 4.Division 5.modulus 6.power

 enter your numbers : 10
5
 enter your option :3
 multiplication  of 10.000000 and 5.000000 is : 50.000000
--------------------------------
Process exited after 14.87 seconds with return value 0
Press any key to continue . . .
```

4)Write a program to swap two given numbers with using extra variable.

program:

```
#include<stdio.h>
int main()
{
        int a;
        int b;
        int temp;
        printf("enter two numbers:");

        scanf("%d \n %d",&a,&b);

        temp=a;

        a=b;

        b=temp;

        printf("after swaping");

        printf("%d \n %d",a,b);




}
```

output:



```
enter two numbers:6
8
after swaping8
 6
--------------------------------
Process exited after 4.207 seconds with return value 5
Press any key to continue . . .
```

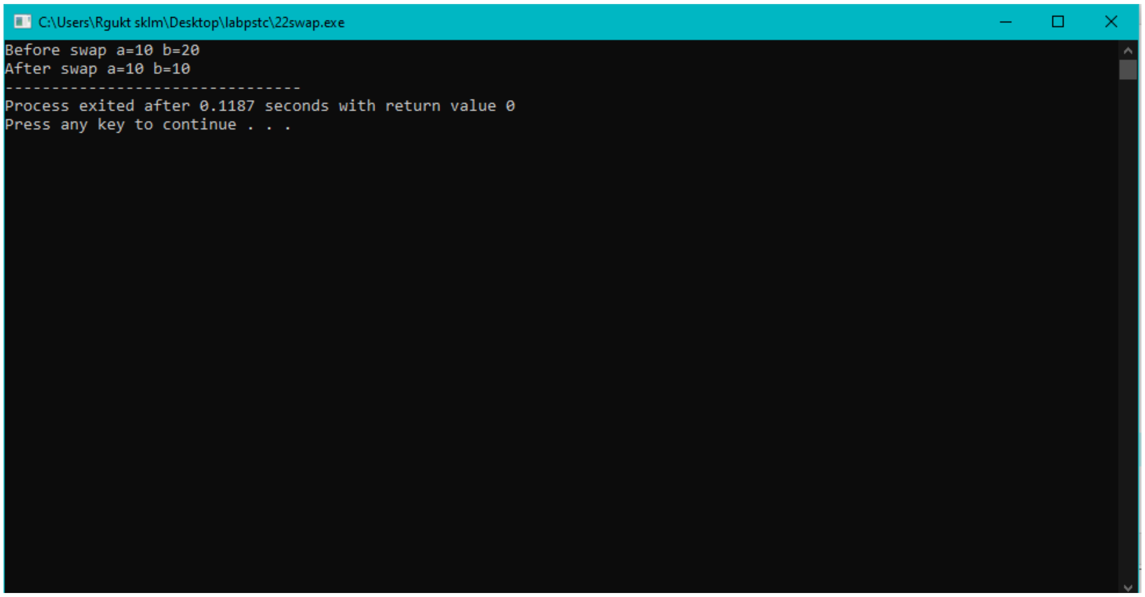
5.Write a program to swap two given numbers without using extra variable

program:

```
#include<stdio.h>

int main()

{
```

```
int a=10, b=20;

printf("Before swap a=%d b=%d",a,b);

a=a+b;//a=30 (10+20)

b=a-b;//b=10 (30-20)

a=a-b;//a=20 (30-10)

a=a-b;//a=20 (30-10)

printf("\nAfter swap a=%d b=%d",a,b);

return 0;

}
```

output:



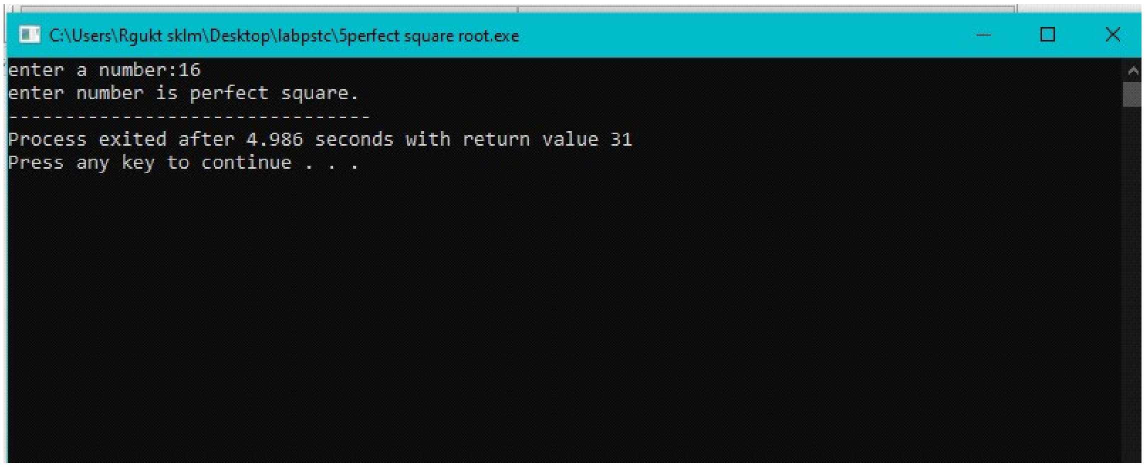
```
Before swap a=10 b=20
After swap a=10 b=10
--------------------------------
Process exited after 0.1187 seconds with return value 0
Press any key to continue . . .
```

6. Write a program to find out the whether the given number is a perfect square or not.

program:

```
#include<stdio.h>

#include<math.h>

int main()

{

        int n;

        printf("enter a number:");
        scanf("%d",&n);

        int root=sqrt(n);

        root=root*root;

        if(root==n)

        {

            printf("enter number is perfect square.");

        }

        else

        printf("enter number is not perfect square.");


}
```

output:


C:\Users\Rgukt sklm\Desktop\labpstc\5perfect square root.exe

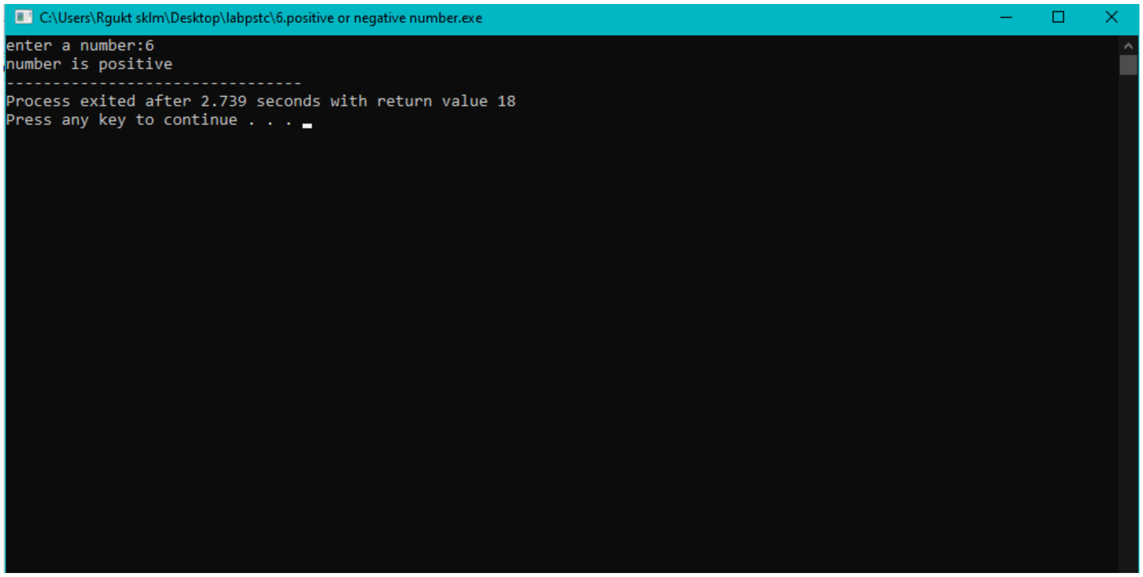
```
enter a number:16
enter number is perfect square.
--------------------------------
Process exited after 4.986 seconds with return value 31
Press any key to continue . . .
```

7.Write a program to find out whether the given number is positive,

program:

```
#include<stdio.h>

int main()

{

        int a;

        printf("enter a number:");
        scanf("%d",&a);

        if(a>0)

        {

                printf("number is positive");

        }

        else if(a<0)

        {

                printf("number is negative");

        }

        else

        {

                printf("number is 0");

        }

}
```

output:


C:\Users\Rgukt sklm\Desktop\labpstc\6.positive or negative number.exe

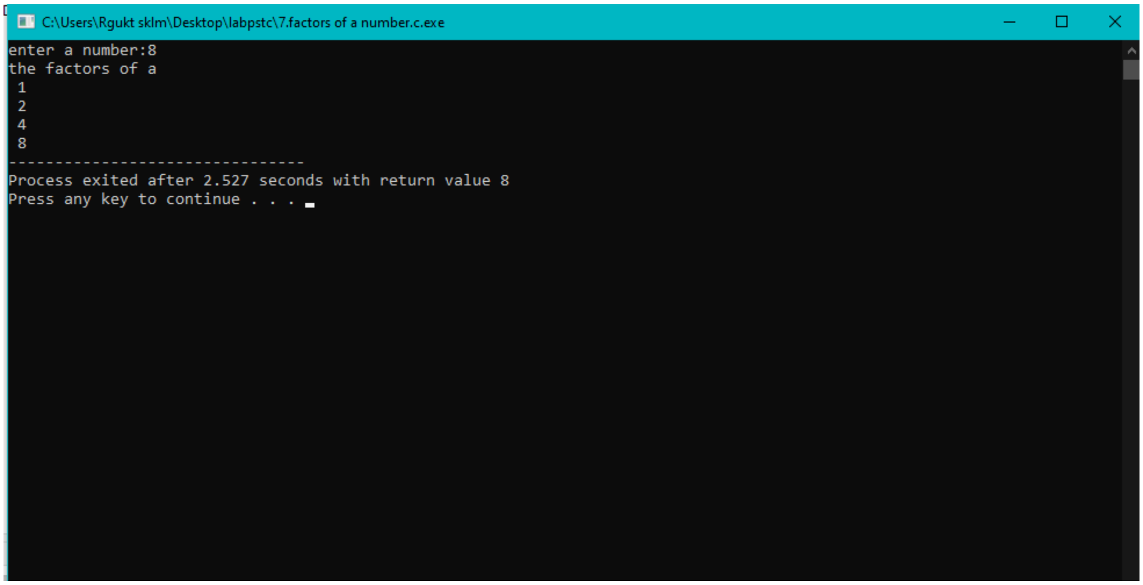
```
enter a number:6
number is positive
--------------------------------
Process exited after 2.739 seconds with return value 18
Press any key to continue . . .
```

8.) Write a program print all the factors of a given number?

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

```
int main()
{
    int p,i;
    printf("enter a number:");
    scanf("%d",&p);
    printf("the factors of a % number are:",p);
    for(i=1;i<=p;i++)
    {
        if(p%i==0)
        {
            printf("\n %d",i);
        }
    }
}
```

output:


C:\Users\Rgukt sklm\Desktop\labpstc\7.factors of a number.c.exe

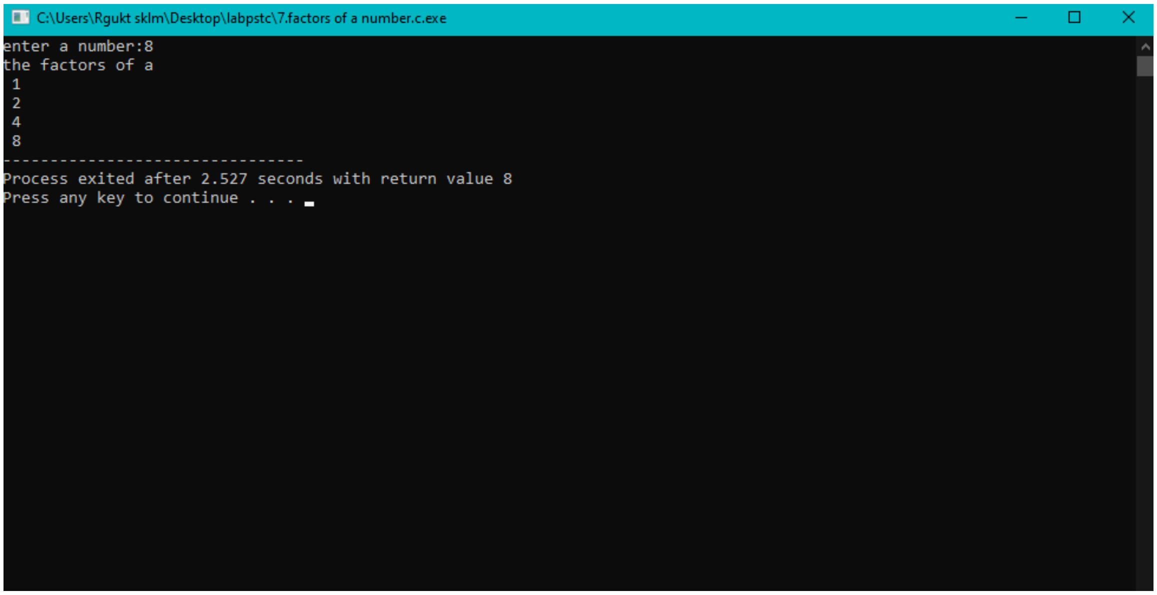
```
enter a number:8
the factors of a
 1
 2
 4
 8
--------------------------------
Process exited after 2.527 seconds with return value 8
Press any key to continue . . .
```

9.Write a program to find the factorial of a given number?

program:

```
#include<stdio.h>
int main()
{
        int n,i,fact=1;
        printf("enter a number:");
        scanf("%d",&n);
        for(i=1;i<=n;i++)
        {
                fact=fact*i;
     }
        printf("%d",fact);

}
```

output:


C:\Users\Rgukt sklm\Desktop\labpstc\7.factors of a number.c.exe

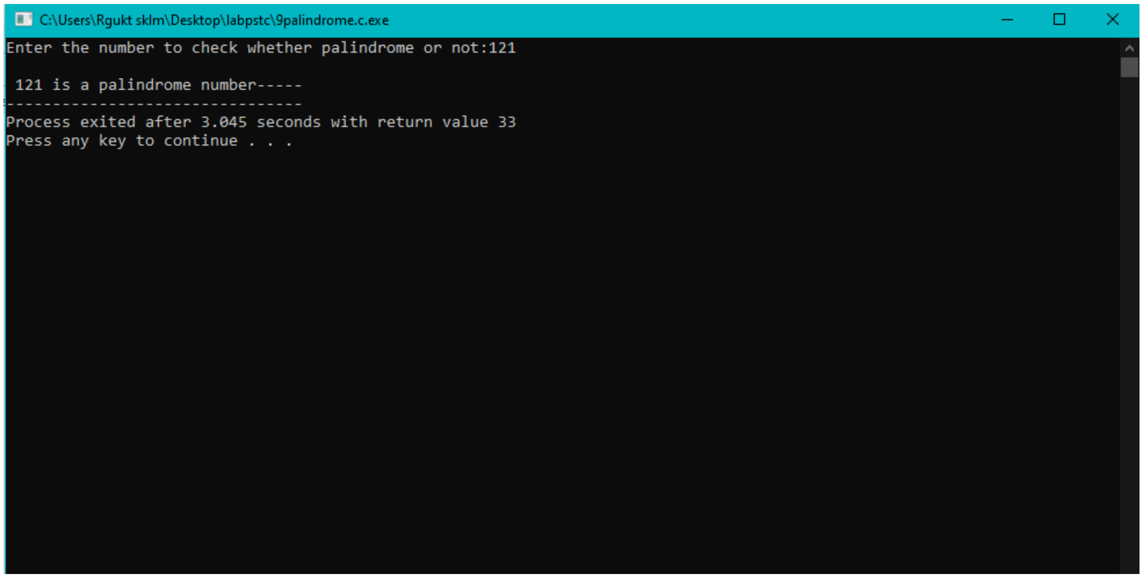
```
enter a number:8
the factors of a
 1
 2
 4
 8
--------------------------------
Process exited after 2.527 seconds with return value 8
Press any key to continue . . .
```

10. Write a program to find whether a given number is Palindrome or not.

program:

```
#include<stdio.h>

int main()

{

        int num,rev=0,rem,temp;

        printf("Enter the number to check whether palindrome or not:");

        scanf("%d",&num);

        temp=num;

        while(temp>0)

        {

                rem=temp%10;

                rev=(rev*10)+rem;

                temp=temp/10;

        }

        if(rev==num)

        printf("\n %d is a palindrome number-----",num);

        else

        printf("\n %d is not a palindrome number-----",num);

}
```

output:



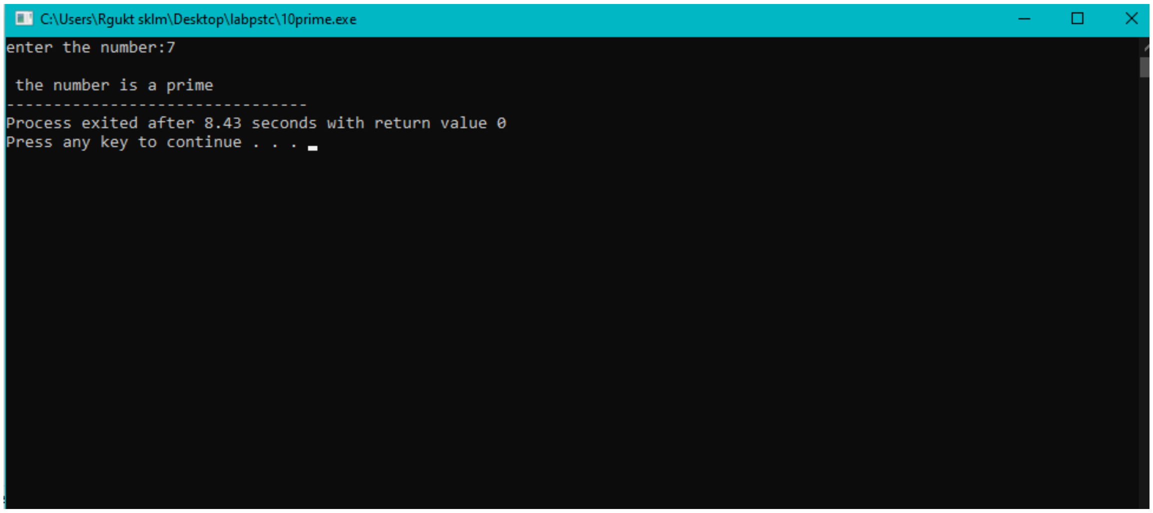
```
Enter the number to check whether palindrome or not:121

 121 is a palindrome number-----
--------------------------------
Process exited after 3.045 seconds with return value 33
Press any key to continue . . .
```

11. Write a program to find whether a given number is Prime or not?

program:

```
#include<stdio.h>

int main()

{

        int n,i,m,flag=0;

        printf("enter the number:");

        scanf("%d",&n);

        m=n/2;

        for(i=2;i<=m;i++)

        {

                if(n%i==0)

                {

                printf("\n the number is not a prime");

                flag=1;

                break;

            }
        }
        if(flag==0)
        printf("\n the number is a prime");
        return 0;

}
```

output:



C:\Users\Rgukt sklm\Desktop\labpstc\10prime.exe

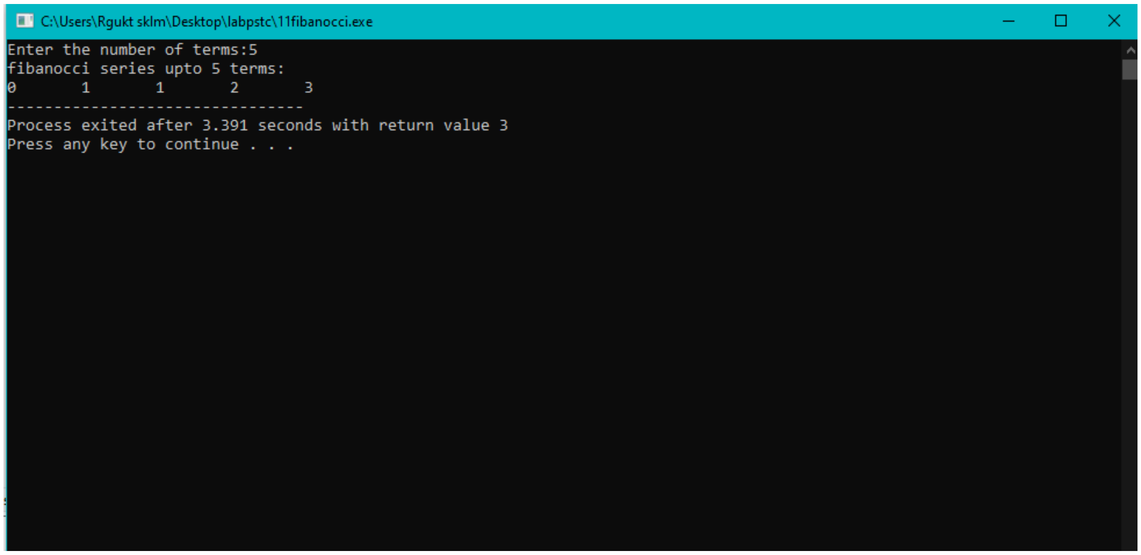
```
enter the number:7

 the number is a prime
--------------------------------
Process exited after 8.43 seconds with return value 0
Press any key to continue . . .
```

12.Write a program to print the Fibonacci series upto given ‘n’ number of terms?

program:

```
#include<stdio.h>
main()
{
        int n,i,f1=0,f2=1,f3;
        printf("Enter the number of terms:");
        scanf("%d",&n);
        printf("fibanocci series upto %d terms:\n",n);
        printf("%d\t%d\t",f1,f2);
        for(i=1;i<=n-2;i++)
        {
                f3=f1+f2;

                printf("%d\t",f3);

                f1=f2;

                f2=f3;

        }

}
```

output:



```
Enter the number of terms:5
fibanocci series upto 5 terms:
0       1       1       2       3
--------------------------------
Process exited after 3.391 seconds with return value 3
Press any key to continue . . .
```

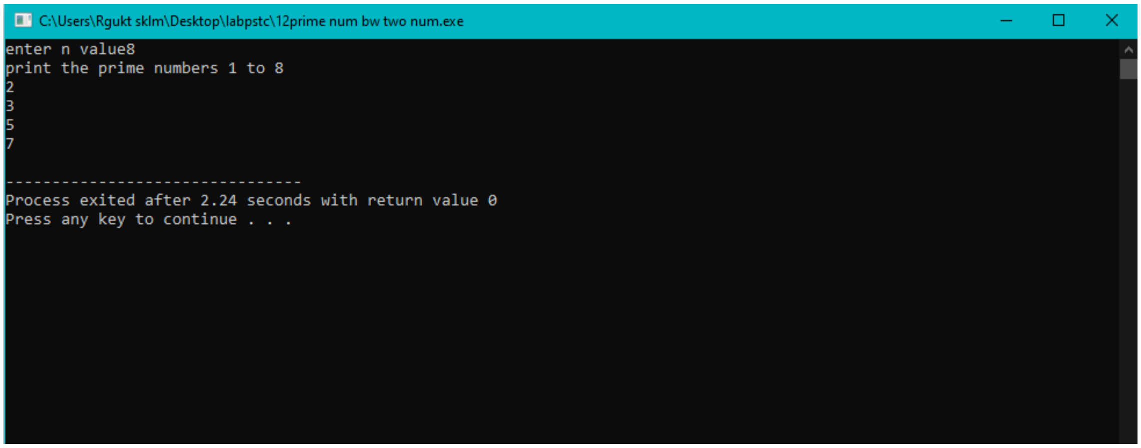
13. Write a program to print the first ‘n’ prime numbers and prime numbers upto ‘n’ value

program:

```
#include<stdio.h>

int main()

{

        int i,j,n,prime;

        printf("enter n value");

        scanf("%d",&n);

        printf("print the prime numbers 1 to %d \n",n);
```

```
    for(i=2;i<=n;i++)

    {

        prime=1;

        for(j=2;j<=i/2;j++)

        {

            if(i%j==0)

            {

                prime=0;

                break;

            }

        }

        if(prime==1)

        {

            printf("%d \n",i);

        }

    }

    return 0;

}
```

output:


C:\Users\Rgukt sklm\Desktop\labpstc\12prime num bw two num.exe

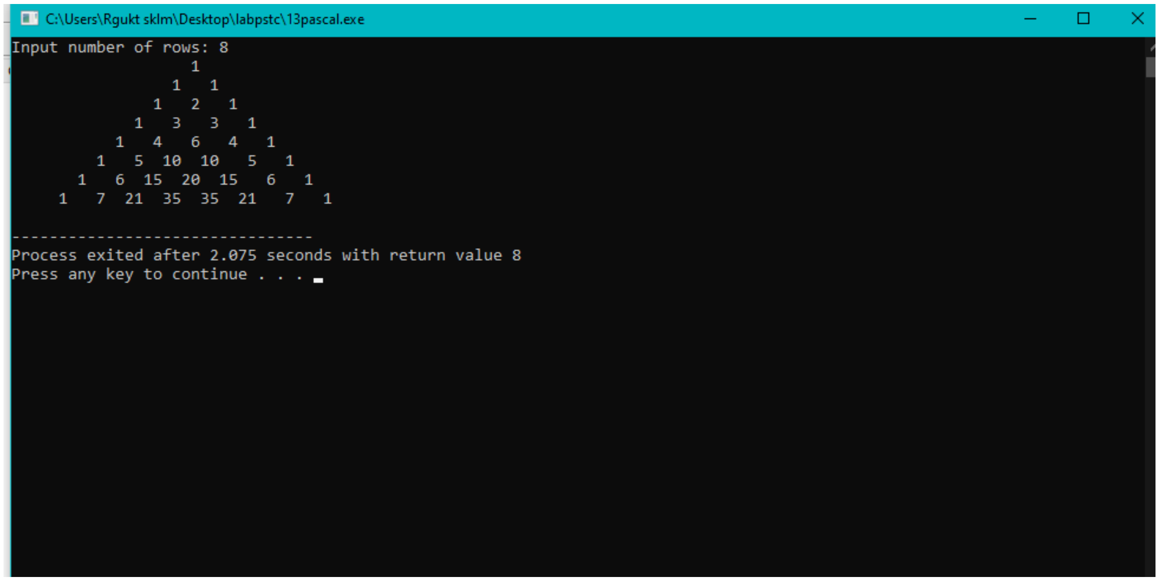
```
enter n value8
print the prime numbers 1 to 8
2
3
5
7

--------------------------------
Process exited after 2.24 seconds with return value 0
Press any key to continue . . .
```

14.Write a program to print the Pascal Triangle for given ‘n’ value?

program:

```
#include <stdio.h>

int main()

{

  int no_row,c=1,blk,i,j;

  printf("Input number of rows: ");

  scanf("%d",&no_row);

  for(i=0;i<no_row;i++)

  {

  for(blk=1;blk<=no_row-i;blk++)

  printf("    ");

  for(j=0;j<=i;j++)

  {

  if (j==0||i==0)

  c=1;

  else

  c=c*(i-j+1)/j;

  printf("% 4d",c);

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

output:



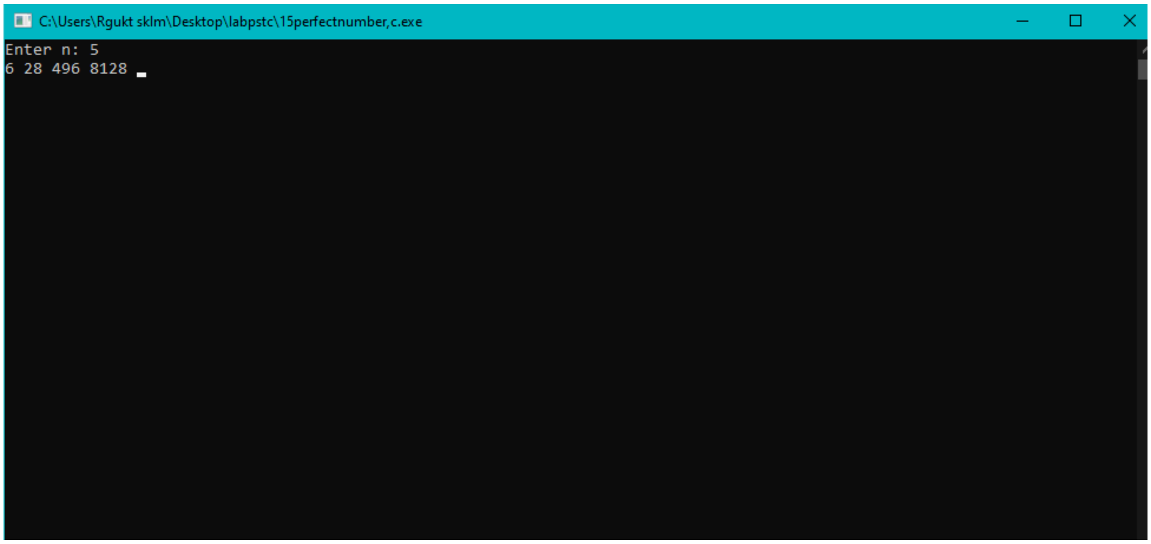
```
Input number of rows: 8
                   1
                 1   1
               1   2   1
             1   3   3   1
           1   4   6   4   1
         1   5  10  10   5   1
       1   6  15  20  15   6   1
     1   7  21  35  35  21   7   1

--------------------------------
Process exited after 2.075 seconds with return value 8
Press any key to continue . . .
```

15.Write a program to print the first ‘n’ perfect number for a given ‘n’ value?

program:

```
#include <stdio.h>
#include<math.h>
int isPerfect(long long int n) {
long long int dsum = 0;
long long int i;
for (i = 1; i <= sqrt(n); ++i) {
if (n % i == 0) {
if (i == n / i) {
dsum += i;
}
else {
dsum += i;
dsum += n / i;
}
}
}
dsum = dsum - n;
if (dsum == n) return 1;
else return 0;
}
int main() {
long long int n, i, temp;
printf("Enter n: ");
scanf("%d", &n);
i = 1;
while (n > 0) {
if (isPerfect(i) == 1) {
printf("%d ", i);
n = n - 1;
}
i = i + 1;
}
printf("\n");
}
```

output:



```
Enter n: 5
6 28 496 8128
```

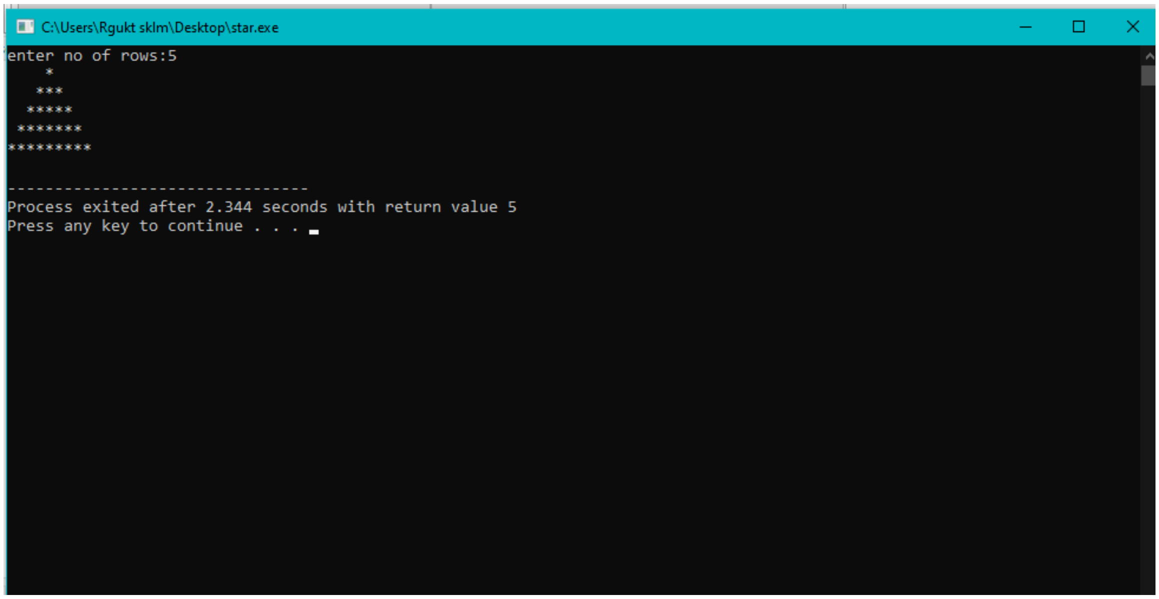
16) Write a program to print the following pattern for given ‘n’ value? For eg.if n = 4,the output would be

```
*

***

*****

***

*
```

Program:

```
#include<stdio.h>

int main()

{

            int rows,space,i,j;

printf("enter no of rows:");

scanf("%d",&rows);

for(i=1;i<=rows;i++)

{

    for(space=1;space<=(rows-i);space++)

      {

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

output:



```
enter no of rows:5
    *
   ***
  *****
 *******
*********

--------------------------------
Process exited after 2.344 seconds with return value 5
Press any key to continue . . .
```

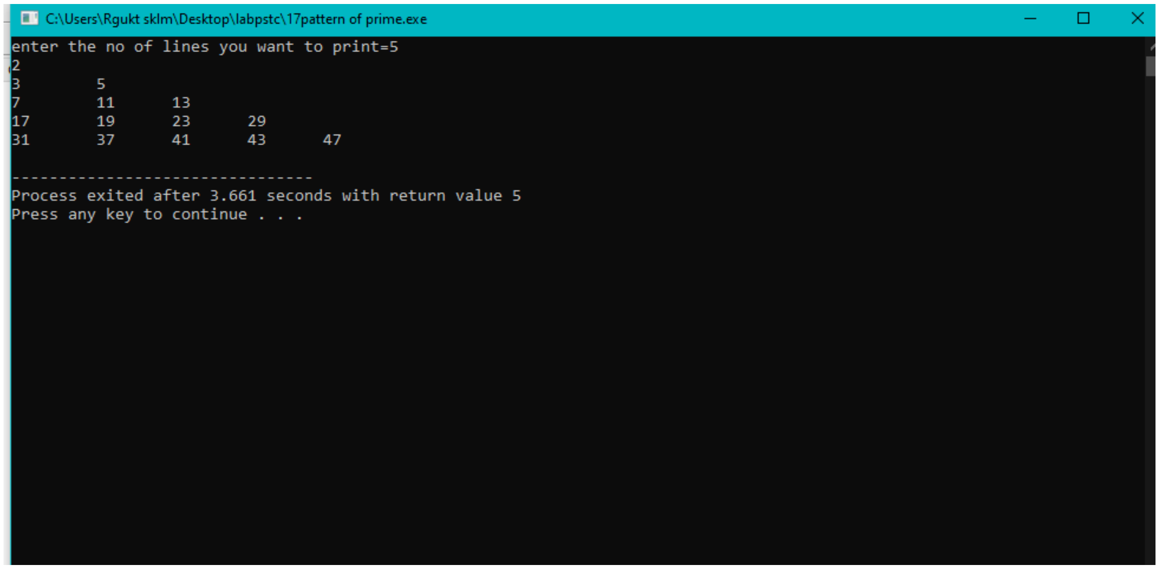
17) Write a program to print the following pattern for given n value

program:

```
#include<stdio.h>
int isprime(int num);           //declaring a fuction
int main()
{
        int num=2,i,j,n;
        printf("enter the no of lines you want to print=");
        scanf("%d",&n);
```

```
    for(i=1;i<=n;i++)           //inner loo[ for rows

    {

        for(j=1;j<=i;j++)           //outer loop for printing elements in columns

        {

            while(!isprime(num))     //while loop executes if it is not a prime number and
terminates if it is not a prime number

            {

                    num++;

            }

            printf("%d\t ",num);

         num++;

        }

        printf("\n");

}

}

int isprime(int num)       //fuction to know whether given number is prime or not

{

    int m,count=0;

    for(m=2;m<num;m++)

    {

        if(num%m!=0)

        count=1;

        else

        {

            count=0;

            break;

        }

    }
if(count==1 || num==2)        //returns 1 if it is a prime number

  return 1;

else

  return 0;                          //returns 0 if it is not a prime number

}
```

output:



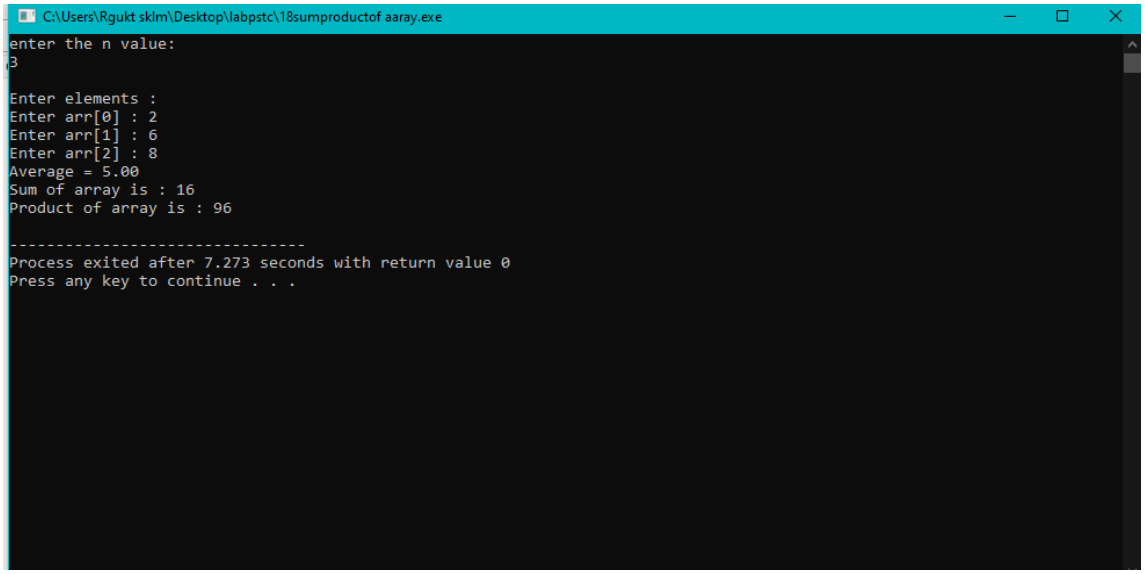
```
enter the no of lines you want to print=5
2
3       5
7       11      13
17      19      23      29
31      37      41      43      47

--------------------------------
Process exited after 3.661 seconds with return value 5
Press any key to continue . . .
```

18. write a program to take an input array of ‘n’ numbers and find out the sum of all the elements, product of all the elements

program:

```
#include <stdio.h>

int main()

{

int arr[10];

int product,i,n,sum;

float num[100],avg;
/*Read array elements*/
printf("enter the n value: \n");
scanf("%d",&n);
printf("\nEnter elements : \n");
for(i=0; i<n; i++)
{
printf("Enter arr[%d] : ",i);
scanf("%d",&arr[i]);
}
/*calculate sum and product*/
sum=0;
product=1;
for(i=0; i<n; i++)
{
sum=sum+arr[i];
product=product*arr[i];
}
avg = sum / n;
printf("Average = %.2f", avg);
printf("\nSum of array is : %d" ,sum);
printf("\nProduct of array is : %d\n",product);
return 0;
}
```

output:


C:\Users\Rgukt sklm\Desktop\labpstc\18sumproductof aaray.exe

```
enter the n value:
3

Enter elements :
Enter arr[0] : 2
Enter arr[1] : 6
Enter arr[2] : 8
Average = 5.00
Sum of array is : 16
Product of array is : 96

--------------------------------
Process exited after 7.273 seconds with return value 0
Press any key to continue . . .
```

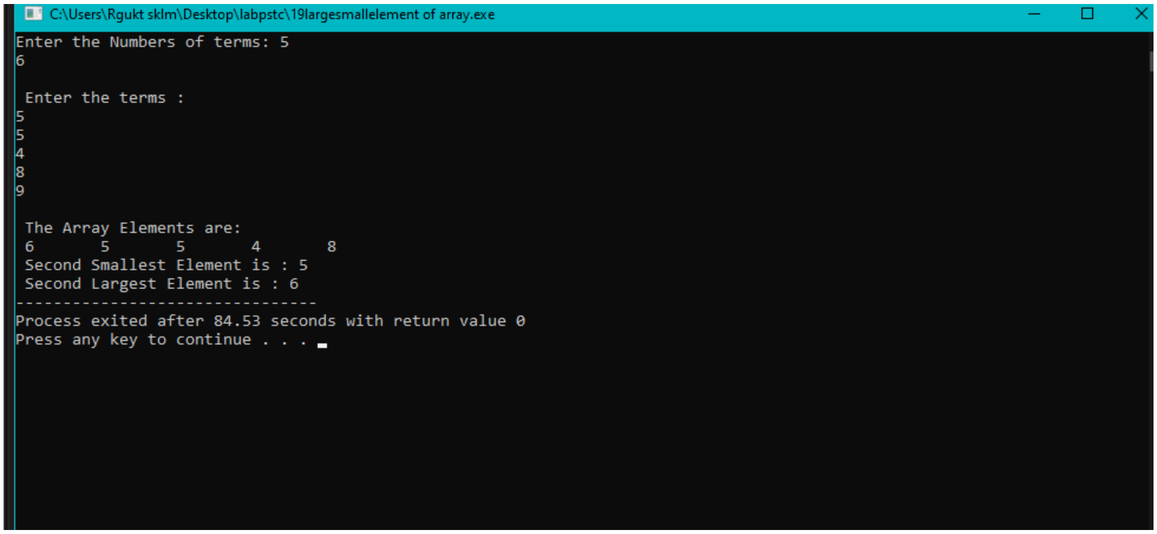
19.19) Write a program to take an input array of 'n' numbers and print the second smallest and second largest element of all elements in the array

program:

```
#include<stdio.h>

int main( )

{

int a[20], b[20], n, sml=0, pos, i, j, temp ;

printf("Enter the Numbers of terms: ") ;

scanf("%d ",&n) ;

printf("\n Enter the terms : \n") ;

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

{

scanf("%d ",&a[i]) ;

b[i] = a[i] ;

}

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

{
```

```
for ( j = 1 ; j<= n ; j++)
{
if ( a[i] <= a[j] )
{
temp = a[i] ;
a[i] = a[j] ;
a[j] = temp ;
}
}
}
printf("\n The Array Elements are: \n") ;
for ( i = 1 ; i<= n ; i++)
printf(" %d \t",b[i]) ;
printf("\n Second Smallest Element is : %d",a[2]) ;
printf("\n Second Largest Element is : %d",a[n-1]) ;
return ( 0 ) ;
}
```

output:


C:\Users\Rgukt sklm\Desktop\labpstc\19largesmallelement of array.exe

```
Enter the Numbers of terms: 5
6

 Enter the terms :
5
5
4
8
9

 The Array Elements are:
 6       5       5       4       8
 Second Smallest Element is : 5
 Second Largest Element is : 6
--------------------------------
Process exited after 84.53 seconds with return value 0
Press any key to continue . . .
```

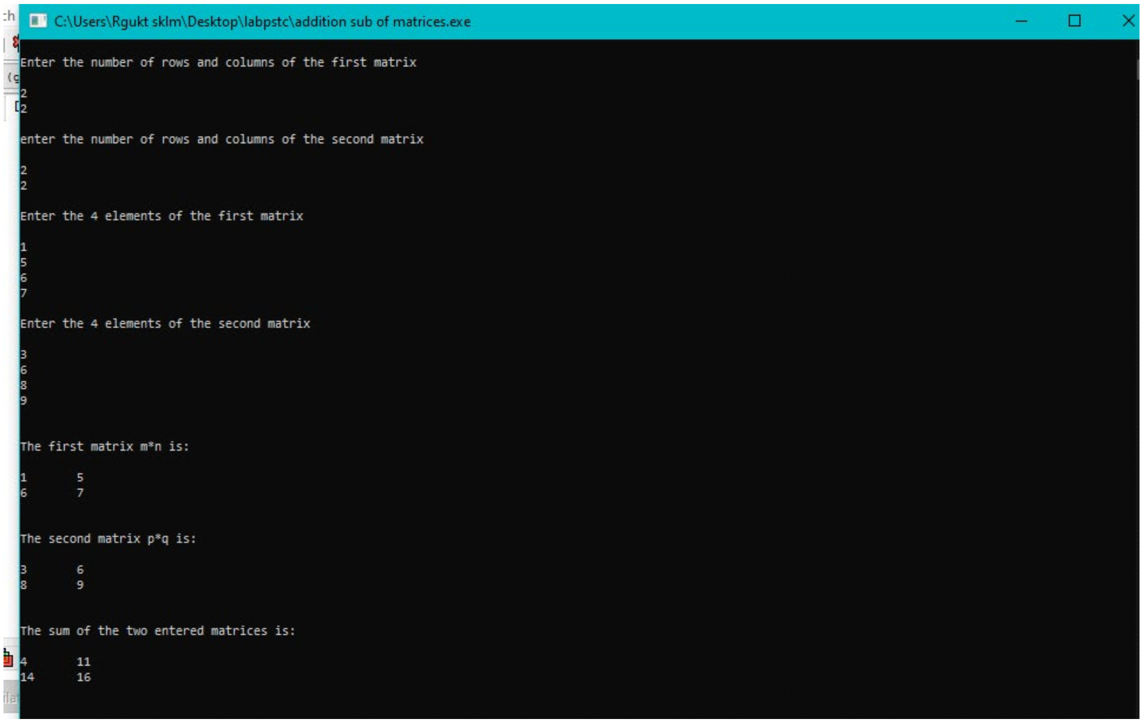
20) Write a program to find the addition and subtraction for the given two matrices of sizes ‘M x N’ and ‘P x Q’ respectively?

program:

```
#include<stdio.h>

int main()

{

int n, m,p,q,c, d, first[10][10], second[10][10], sum[10][10], diff[10][10];

printf("\nEnter the number of rows and columns of the first matrix \n\n");

scanf("%d%d", &m, &n);

printf("\nenter the number of rows and columns of the second matrix \n\n");

scanf("%d%d",&p,&q);

printf("\nEnter the %d elements of the first matrix \n\n", m*n);

for(c = 0; c < m; c++)

for(d = 0; d < n; d++)

scanf("%d", &first[c][d]);

printf("\nEnter the %d elements of the second matrix\n\n", p*q);

for(c = 0; c < p; c++)

for(d = 0; d < q; d++)

scanf("%d", &second[c][d]);
```

```
printf("\n\nThe first matrix m*n is: \n\n");

for(c = 0; c < m; c++)

{

for(d = 0; d < n; d++)

{

printf("%d\t", first[c][d]);

}

printf("\n");

}

printf("\n\nThe second matrix p*q is: \n\n");

for(c = 0; c < p; c++)

{

for(d = 0; d < q; d++)

{

printf("%d\t", second[c][d]);

}

printf("\n");

}

for(c = 0; c < m; c++)

for(d = 0; d < n; d++)

sum[c][d] = first[c][d] + second[c][d];

printf("\n\nThe sum of the two entered matrices is: \n\n");

for(c = 0; c < m; c++)

{

for(d = 0; d < n; d++)

{

printf("%d\t", sum[c][d]);

}
printf("\n");

}

for(c = 0; c < m; c++)

for(d = 0; d < n; d++)

diff[c][d] = first[c][d] - second[c][d];

printf("\n\nThe difference(subtraction) of the two entered matrices is: \n\n");

for(c = 0; c < m; c++)

{

for(d = 0; d < n; d++)

{

printf("%d\t", diff[c][d]);

}

printf("\n");

}

return 0;

}
```

output:


C:\Users\Rgukt sklm\Desktop\labpstc\addition sub of matrices.exe

```
Enter the number of rows and columns of the first matrix

2
2

enter the number of rows and columns of the second matrix

2
2

Enter the 4 elements of the first matrix

1
5
6
7


Enter the 4 elements of the second matrix

3
6
8
9



The first matrix m*n is:

1       5
6       7


The second matrix p*q is:

3       6
8       9


The sum of the two entered matrices is:

4       11
14      16
```

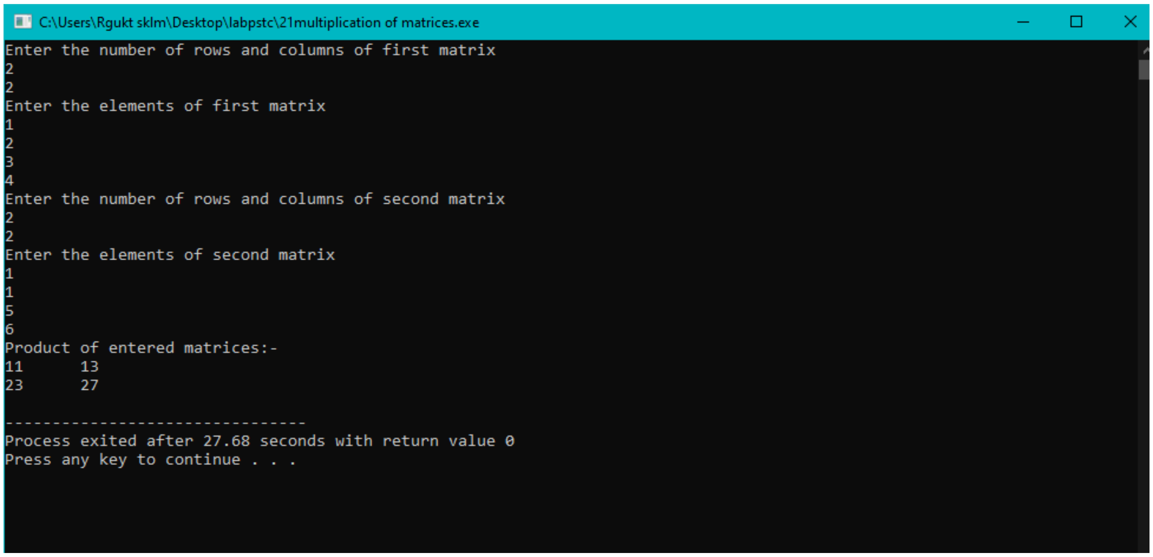
21.write a program to find the multiplication of the given two matrices of sizes ‘m x n’ and ‘p x q’ respectively

program:

```
#include <stdio.h>

int main()

{



int m, n, p, q, c, d, k, sum = 0;

int first[10][10], second[10][10], multiply[10][10];

printf("Enter the number of rows and columns of first matrix\n");

scanf("%d%d", &m, &n);

printf("Enter the elements of first matrix\n");

for ( c = 0 ; c < m ; c++ )

for ( d = 0 ; d < n ; d++ )

scanf("%d", &first[c][d]);

printf("Enter the number of rows and columns of second matrix\n");
```

```
scanf("%d%d", &p, &q);
if ( n != p ){
printf("Matrices with entered orders can't be multiplied with each other.\n");
}
else
{
printf("Enter the elements of second matrix\n");
for ( c = 0 ; c < p ; c++ )
for ( d = 0 ; d < q ; d++ )
scanf("%d", &second[c][d]);
for ( c = 0 ; c < m ; c++ )
{
for ( d = 0 ; d < q ; d++ )
{
for ( k = 0 ; k < p ; k++ )
{
sum = sum + first[c][k]*second[k][d];

}
multiply[c][d] = sum;
sum = 0;
}
}
printf("Product of entered matrices:-\n");
for ( c = 0 ; c < m ; c++ )
{
for ( d = 0 ; d < q ; d++ )
printf("%d\t", multiply[c][d]);
printf("\n");

}

}

return 0;

}
```

output:



C:\Users\Rgukt sklm\Desktop\labpstc\21multiplication of matrices.exe

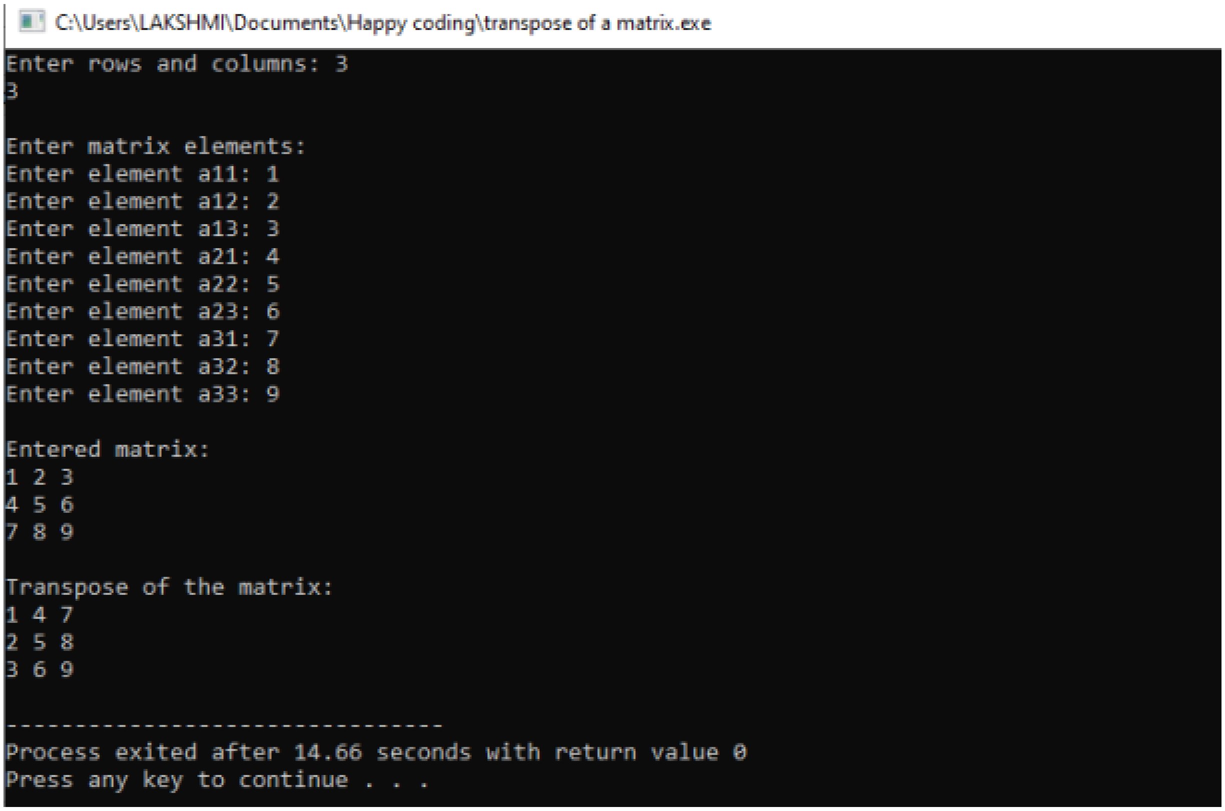
```
Enter the number of rows and columns of first matrix
2
2
Enter the elements of first matrix
1
2
3
4
Enter the number of rows and columns of second matrix
2
2
Enter the elements of second matrix
1
1
5
6
Product of entered matrices:-
11      13
23      27

--------------------------------
Process exited after 27.68 seconds with return value 0
Press any key to continue . . .
```

22. write a program to find the transpose of a matrix

```
#include <stdio.h>

int main()

{

int a[10][10], transpose[10][10], r, c;

printf("Enter rows and columns: ");

scanf("%d %d", &r, &c);

printf("\nEnter matrix elements:\n");

for(int i = 0; i<r; ++i)

{

for (int j = 0; j < c; ++j)

  {
```

```
printf("Enter element a%d%d: ", i + 1, j + 1);

scanf("%d ", &a[i][j]);

}

printf("\nEntered matrix: \n");

for (int i = 0; i < r; ++i)

for (int j = 0; j < c; ++j) {

printf("%d ", a[i][j]);

if (j == c - 1)

printf("\n");

}

for (int i = 0; i < r; ++i)

for (int j = 0; j < c; ++j) {

transpose[j][i] = a[i][j];

}

printf("\nTranspose of the matrix:\n");

for (int i = 0; i < c; ++i)

for (int j = 0; j < r; ++j) {

printf("%d ", transpose[i][j]);

if (j == r - 1)

printf("\n");

}

return 0;

}

}
```

Output:



C:\Users\LAKSHMI\Documents\Happy coding\transpose of a matrix.exe

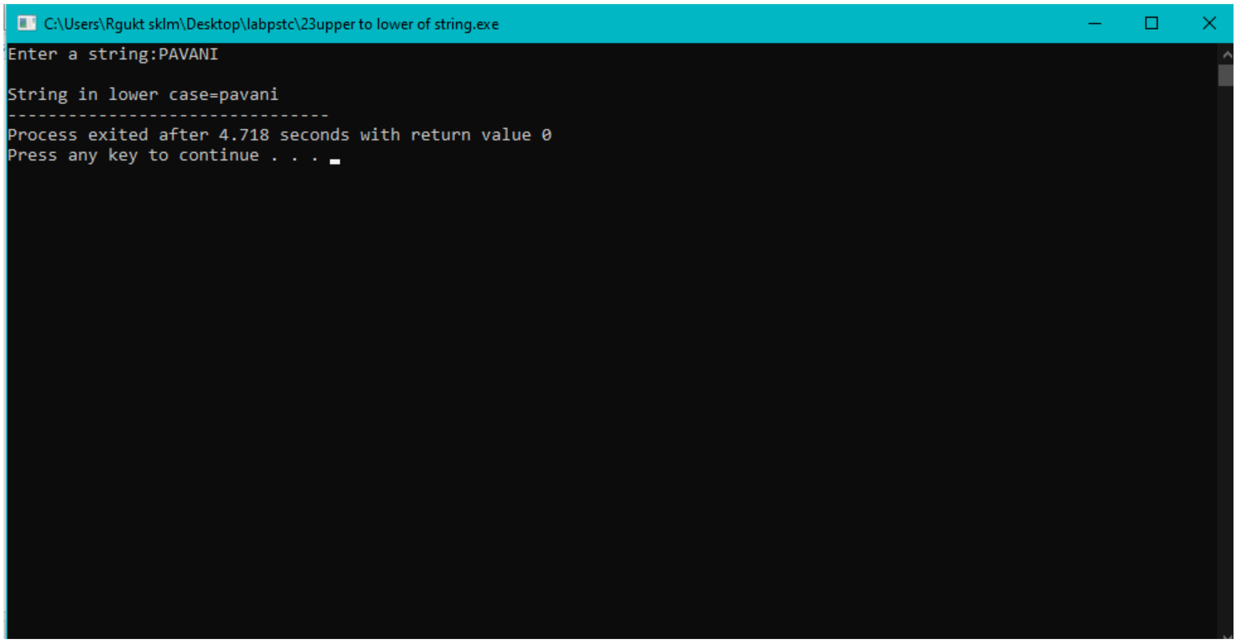
```
Enter rows and columns: 3
3

Enter matrix elements:
Enter element a11: 1
Enter element a12: 2
Enter element a13: 3
Enter element a21: 4
Enter element a22: 5
Enter element a23: 6
Enter element a31: 7
Enter element a32: 8
Enter element a33: 9

Entered matrix:
1 2 3
4 5 6
7 8 9

Transpose of the matrix:
1 4 7
2 5 8
3 6 9

--------------------------------
Process exited after 14.66 seconds with return value 0
Press any key to continue . . .
```

23) Write a program to convert the Lower Case letters to Upper Case Letters and Upper Case Letters to Lower Case Letters in a given input string

Program:

```
#include<stdio.h>

#include<string.h>

int main()

{

        char str[100];

        int i;

        printf("Enter a string:");

        gets(str);

        for(i=0;str[i]!='\0';i++)

        {

                if( str[i]>='A'&&str[i]<='Z'){
                    str[i]=str[i]+32;
                }
        }
        printf("\nString in lower case=%s",str);
        return 0;
}
```

Output:


C:\Users\Rgukt sklm\Desktop\labpstc\23upper to lower of string.exe

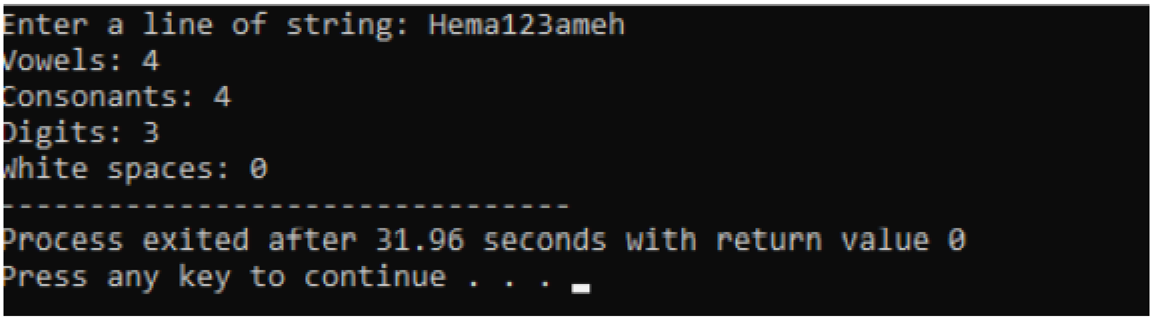
```
Enter a string:PAVANI

String in lower case=pavani
--------------------------------
Process exited after 4.718 seconds with return value 0
Press any key to continue . . .
```

24) Write a program to the print out the number of vowels, consonants, and digits (0-9) present in the given input string

Program:

```
#include <stdio.h>
int main() {
char line[150];
int vowels, consonant, digit, space;
vowels = consonant = digit = space = 0;
printf("Enter a line of string: ");
fgets(line, sizeof(line), stdin);
for (int i = 0; line[i] != '\0'; ++i) {
if (line[i] == 'a' || line[i] == 'e' || line[i] == 'i' ||
line[i] == 'o' || line[i] == 'u' || line[i] == 'A' ||
line[i] == 'E' || line[i] == 'I' || line[i] == 'O' ||
line[i] == 'U') {
++vowels;
} else if ((line[i] >= 'a' && line[i] <= 'z') || (line[i] >= 'A' && line[i] <='Z'))
{
        ++consonant;
} else if (line[i] >= '0' && line[i] <= '9') {
++digit;
} else if (line[i] == ' ') {
++space;
}
}
printf("Vowels: %d", vowels);
printf("\nConsonants: %d", consonant);
printf("\nDigits: %d", digit);
printf("\nWhite spaces: %d", space);
return 0;
}
```

Output:

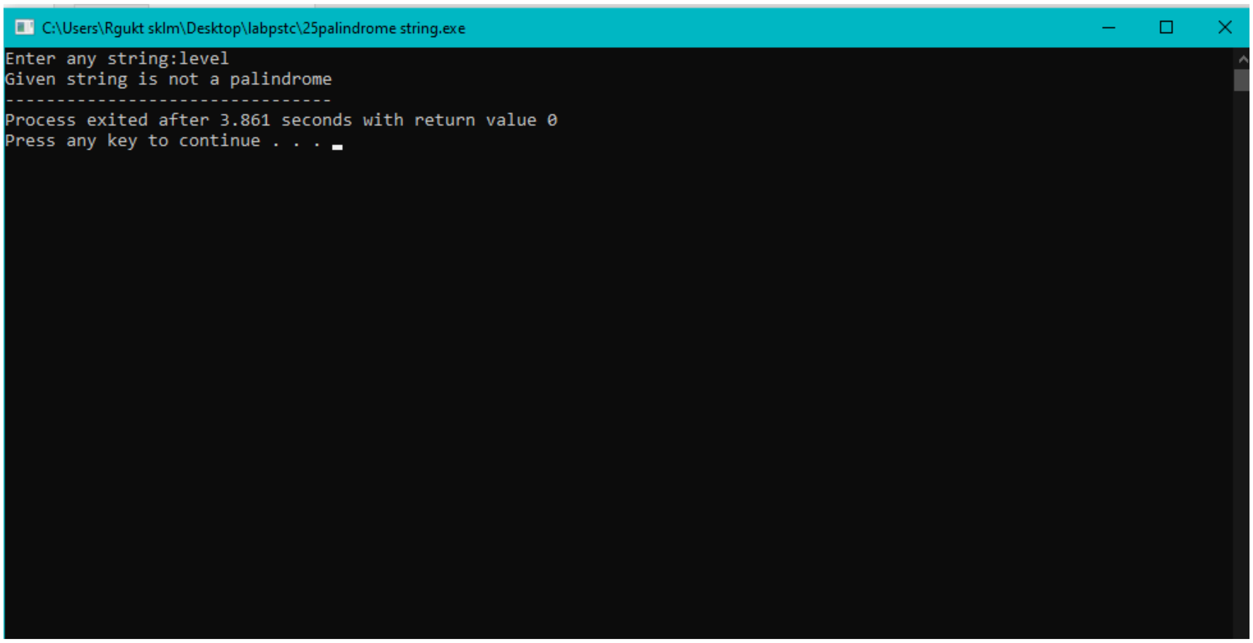


```
Enter a line of string: Hema123ameh
Vowels: 4
Consonants: 4
Digits: 3
White spaces: 0
--------------------------------
Process exited after 31.96 seconds with return value 0
Press any key to continue . . .
```

25.) Write a program to check whether the given input string is palindrome string or not

```
#include<stdio.h>

#include<string.h>

int main()

{

        char str[100];

        int i, len, flag;

        flag=0;

        len=strlen(str);

        printf("Enter any string:");

        gets(str);

        for(i=0; i<len; i++);

        {

            if(str[i]!=str[len-i-1])

            {

              flag=1;

         }

        }

        if(flag==0)
        {
                printf("Given string is palindrome");
        }
        else
        {
             printf("Given string is not a palindrome");
        }
        return 0;
}
```

Output:



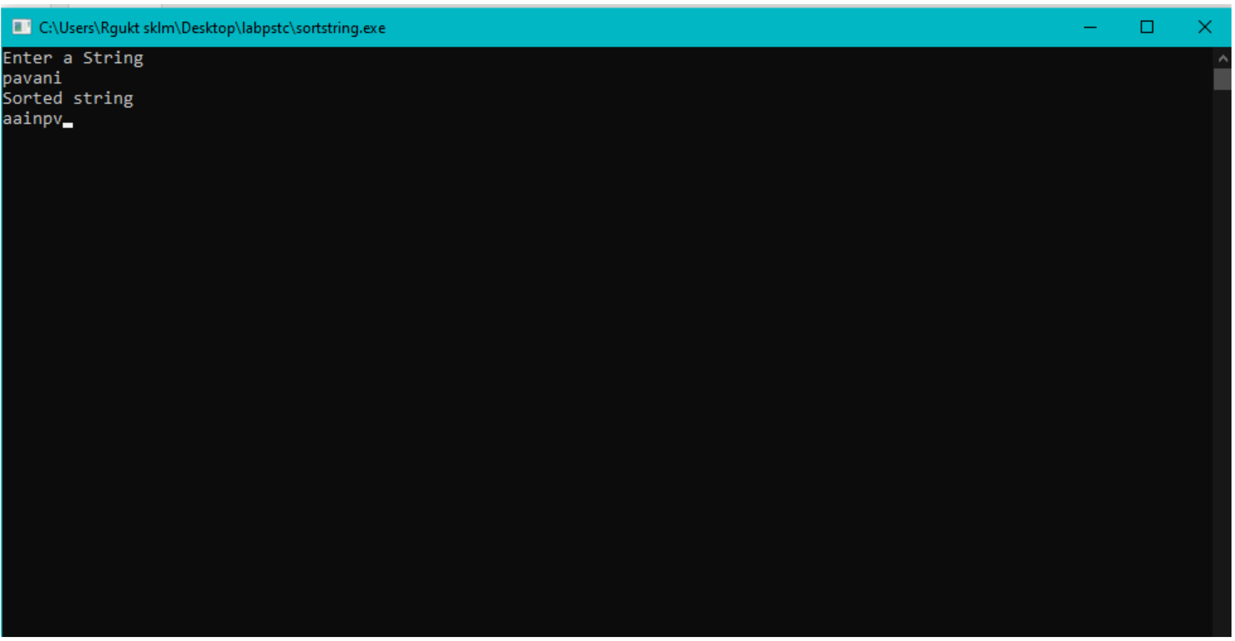
```
Enter any string:level
Given string is not a palindrome
--------------------------------
Process exited after 3.861 seconds with return value 0
Press any key to continue . . .
```

26. Write a program to sort the given string of characters

```
#include <stdio.h>

#include <conio.h>

#include <string.h>

void sortString(char* inputString, char* outputArray);

int main(){
```

```
char inputString[100], outputArray[100];

printf("Enter a String \n");

gets(inputString);

sortString(inputString, outputArray);

printf("Sorted string \n%s", outputArray);

getch();

return 0;

}

void sortString(char* inputString, char* outputArray){

/* initialize counterArray to 0 */

int counterArray[256] ={0}, length, counter, index;

length = strlen(inputString);

/* Count frequency of characters in input array*/

for(counter = 0; counter < length; counter++){

counterArray[inputString[counter]]++;

}

/* Populate output array */

for(counter = 0, index = 0; counter < 256; counter++)

{

        if(counterArray[counter] != 0){

while(counterArray[counter] > 0){

outputArray[index++] = counter;

counterArray[counter]-- ;

}

}
}

outputArray[index] = '\0';

}
```

Output:



```
Enter a String
pavani
Sorted string
aainpv
```

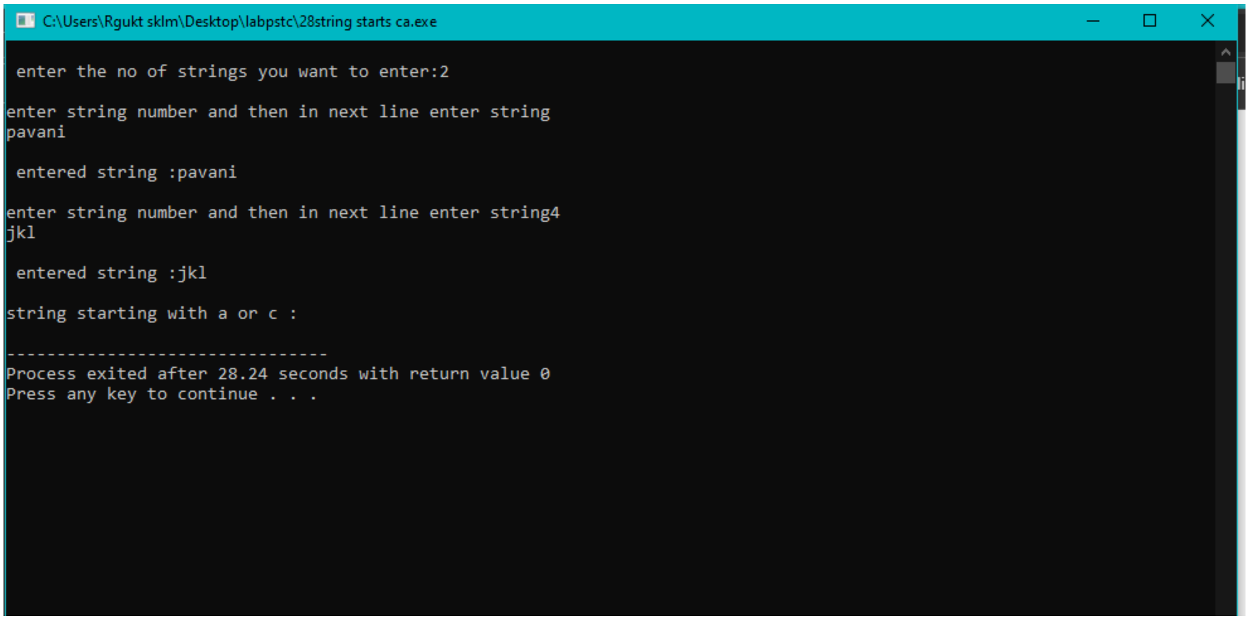
2

28. Write a program to find the strings starting with “c” and “a” for the given n input strings

```
#include<stdio.h>

#include<string.h>

#include<stdio.h>

#include<string.h>

int main(){

char str[100][100],ch;

int n,i,k;

printf("\n enter the no of strings you want to enter:");

scanf("%d",&n);

i=0;

while(n){
```

```
printf("\nenter string number and then in next line enter string");

scanf("%d\n",&k);

gets(str[i]);

printf("\n entered string :");

puts(str[i]);

n--;

i++;

}

i=0;

printf("\nstring starting with a or c :\n");

while(k){

ch=str[i][0];

if(ch=='a'){

puts(str[i]);

}

else if(ch=='c'){

puts(str[i]);

}

i++;

k--;

}

return 0;

}
```

Output:

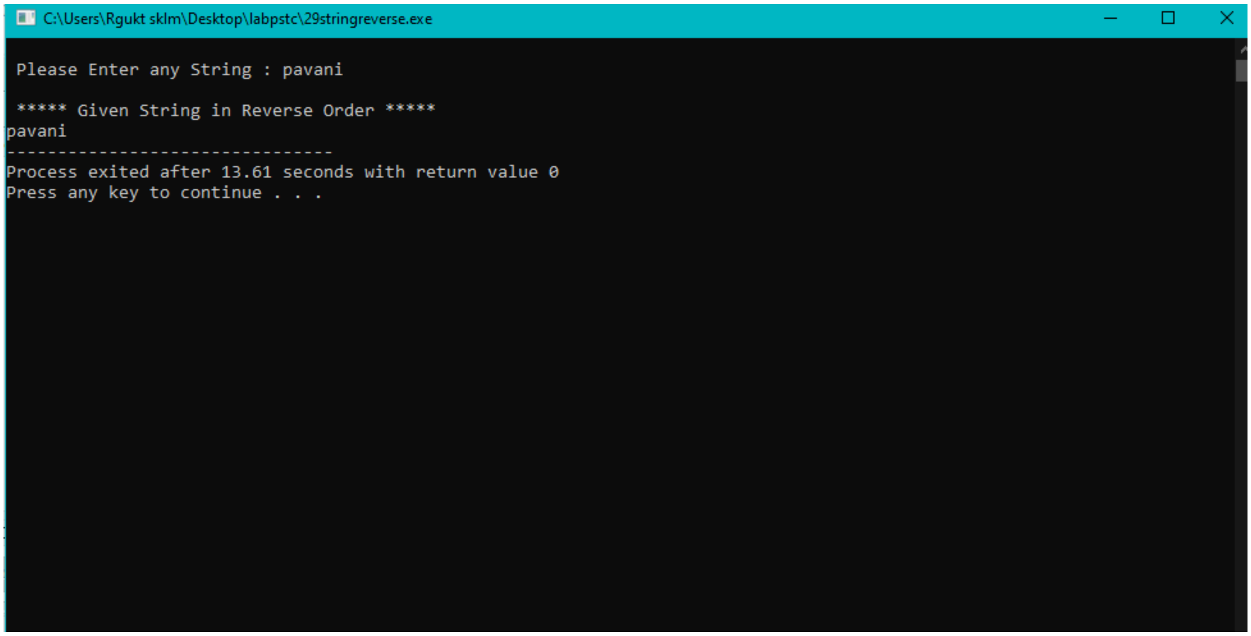


```
 enter the no of strings you want to enter:2

enter string number and then in next line enter string
pavani

 entered string :pavani

enter string number and then in next line enter string4
jkl

 entered string :jkl

string starting with a or c :

--------------------------------
Process exited after 28.24 seconds with return value 0
Press any key to continue . . .
```

29. Write a program to print the words of given input string in reverse order?

```
#include <stdio.h>

#include <string.h>

int main()

{

char str[100];

int i, j, len, startIndex, endIndex;

printf("\n Please Enter any String : ");

gets(str);

len = strlen(str);

endIndex = len - 1;

printf("\n ***** Given String in Reverse Order ***** \n");

for(i = len - 1; i >= 0; i--)

{

if(str[i] == ' ' || i == 0)
{

if(i == 0)

{

startIndex = 0;

}

else

{

startIndex = i + 1;

}

for(j = startIndex; j <= endIndex; j++)

{

printf("%c", str[j]);

}

endIndex = i - 1;

printf(" ");

}

}

return 0;

}
```

Output:



```
 Please Enter any String : pavani

 ***** Given String in Reverse Order *****
pavani
--------------------------------
Process exited after 13.61 seconds with return value 0
Press any key to continue . . .
```

30. Write a program to arrange the given ‘n’ strings in Dictionary Order?

```
  #include <stdio.h>

#include <string.h>

int main() {

char str[5][50], temp[50];

printf("Enter 5 words: ");

for (int i = 0; i < 5; ++i)

{

fgets(str[i], sizeof(str[i]), stdin);

}

for (int i = 0; i < 5; ++i) {

for (int j = i + 1; j < 5; ++j) {

if (strcmp(str[i], str[j]) > 0) {

strcpy(temp, str[i]);

strcpy(str[i], str[j]);

strcpy(str[j], temp);
}

}

}

printf("\nIn the dictionary order: \n");

for (int i = 0; i < 5; ++i) {

fputs(str[i], stdout);

}

return 0;

}
```

Output:

31,32,33,34,35) Write a program to implement the string operations like Length of String, String Copying, String Concatenation, Conversion to Uppercase and String Comparison.(Define own Function for each of the operation. Header file “string.h” is not allowed)

Program:

```
#include<stdio.h>

char len(char str[]){

int i=0;

while(str[i]){

i=i+1;

}

printf("\n length of the string is %d",i);

}

char copy(char str[]){

char copy[100];
```

```
int i=0;

while(str[i]){

copy[i]=str[i];

i=i+1;

}

printf("\nstring after copy: ");

i=0;

while(copy[i]){

printf("%c",copy[i]);

i=i+1;

}

}

char conct(char str1[],char str2[]){

char concte[100];

int i=0,j=0;

while(str1[i]){

concte[i]=str1[i];

i=i+1;

}

while(str2[j]){

concte[i]=str2[j];

i=i+1;

j=j+1;

}

printf("\nstring after concatination is :");
```

```
i=0;

while(concte[i]){

printf("%c",concte[i]);

i=i+1;

}

}

char upp(char str[]){

int i=0;

printf("\n string in upper:\n");

while(str[i]){

printf("%c",str[i]-32);

i=i+1;

}

}

char compare(char str1[],char str2[]){

int i=0,n=0,k=0;

while(str1[i]||str2[i]){

if(str1[i]>str2[i]){

k++;

i=100;

}

else if(str1[i]==str2[i]){

k=k;

n=n;

i++;
}

else{

n++;

i=100;

}

}

if(k>0){

printf("\nstring 2 is grater");

}

else if(n>0){

printf("\nstring 3 is grater");

}

else if(k==0&&n==0){

printf("\nboth strings are equal");

}

}

int main(){

char str[100],str1[100],str2[100];

printf("enter string number 1");

gets(str);

printf("\n enter string number 2");

gets(str1);

printf("\n enter string number 3");

gets(str2);

len(str);
```

copy(str);

conct(str1,str2);

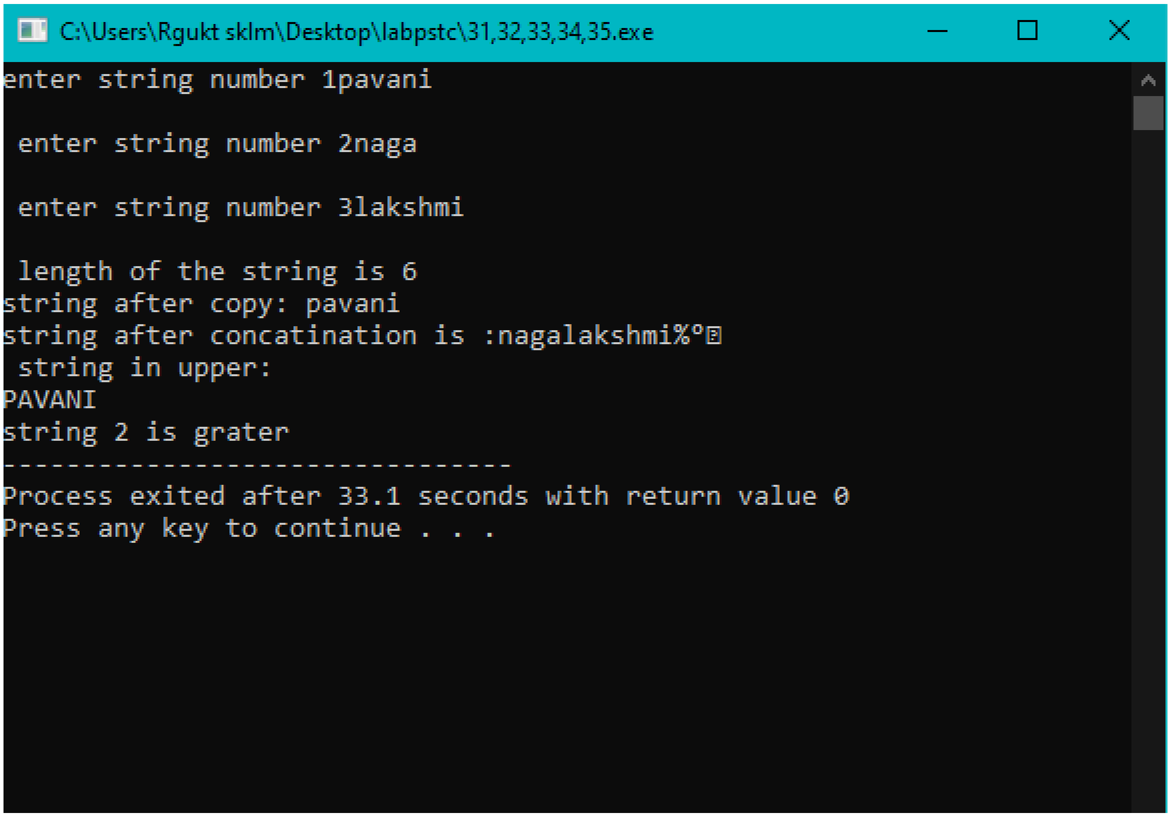
upp(str);

compare(str1,str2);

return 0;

}

Output:



```
enter string number 1pavani

 enter string number 2naga

 enter string number 3lakshmi

 length of the string is 6
string after copy: pavani
string after concatination is :nagalakshmi%°⍰
 string in upper:
PAVANI
string 2 is grater
--------------------------------
Process exited after 33.1 seconds with return value 0
Press any key to continue . . .
```

36.) Write a C program to implement Multiplication and Division Operations without using operators “*” and “\” respectively. Define function “mul” for multiplication and “div” for integer

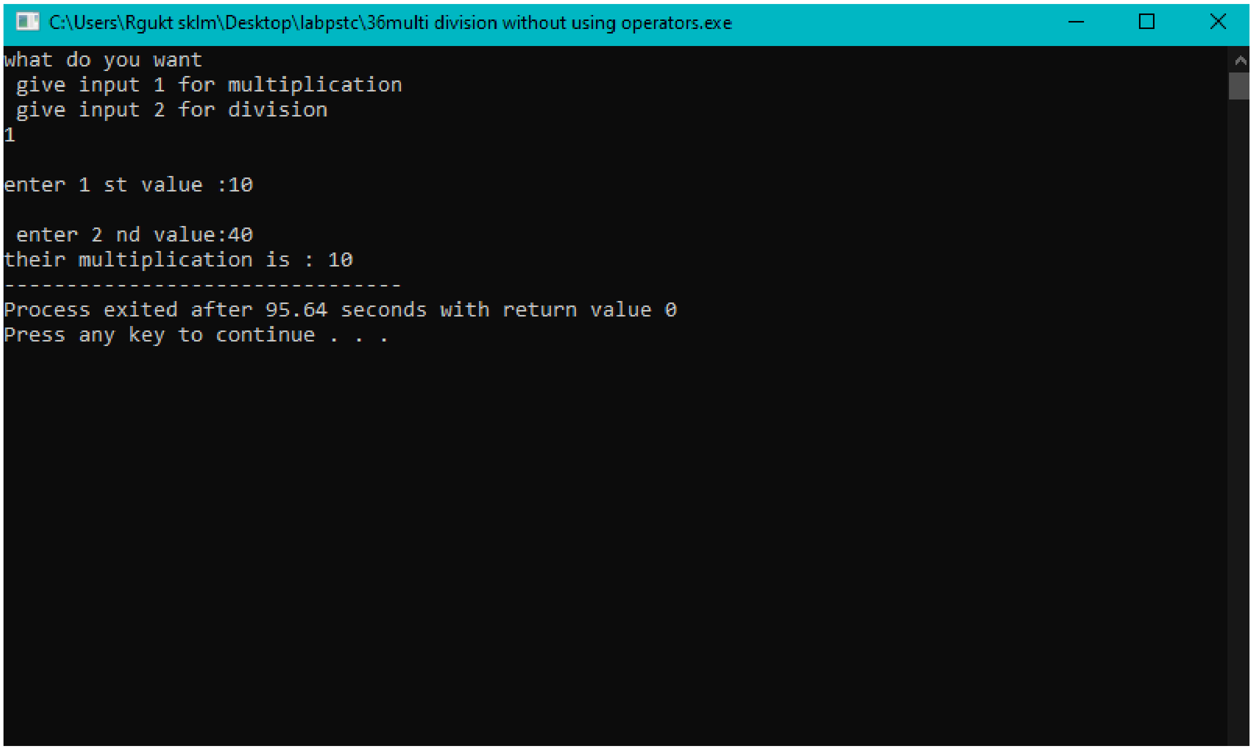
#include<stdio.h>

int mul(int a,int b)

{

```
int i,c;

c=a;

for(i=0;i<b;i++){

c=c+a;

}

printf("their multiplication is : %d",a);

}

int div(int a,int b){

int i=0;

while(a>=b){

a=a-b;

i++;

}

printf("reminder is %d",a);

printf("quotient is %d",i);

printf("\n a/b is %d",i);

}

int main(){

int a,b,option;

printf("what do you want\n give input 1 for multiplication \n give input 2 for division\n" );

scanf("%d",&option);

switch(option){

case(1):{

printf("\nenter 1 st value :");

scanf("%d",&a);
printf("\n enter 2 nd value:");
scanf("%d",&b);
mul(a,b);
break;
}
case(2):{
printf("\nenter 1 st value :");
scanf("%d",&a);
printf("\n enter 2 nd value:");
scanf("%d",&b);
div(a,b);
break;
}
}
return 0;
}
```

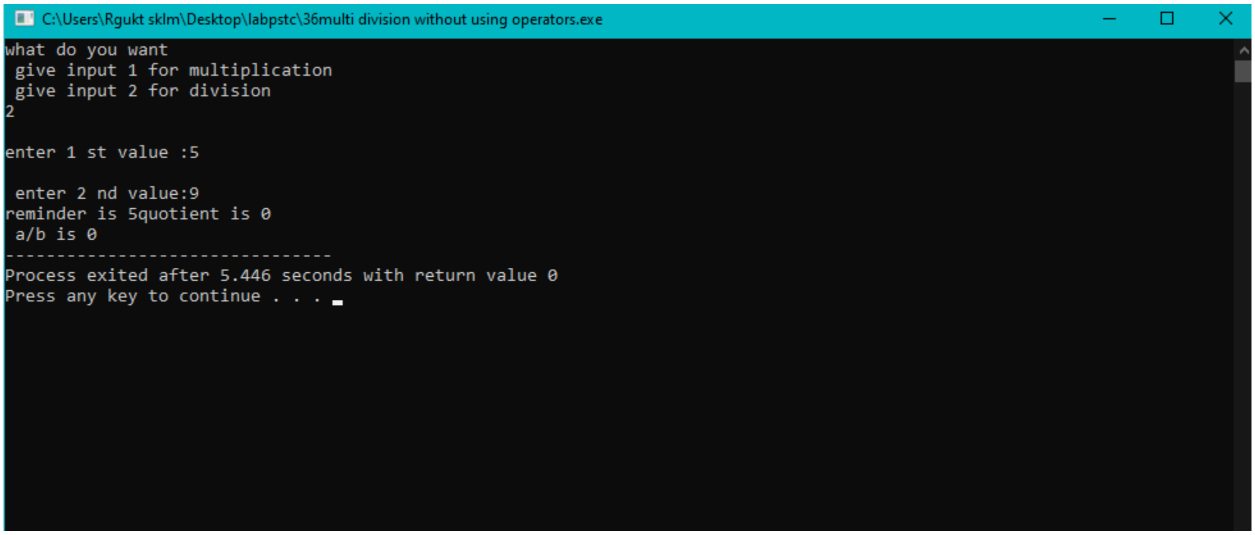
Output:


C:\Users\Rgukt sklm\Desktop\labpstc\36multi division without using operators.exe

```
what do you want
 give input 1 for multiplication
 give input 2 for division
1

enter 1 st value :10

 enter 2 nd value:40
their multiplication is : 10
--------------------------------
Process exited after 95.64 seconds with return value 0
Press any key to continue . . .
```

37.

Output:


C:\Users\Rgukt sklm\Desktop\labpstc\36multi division without using operators.exe

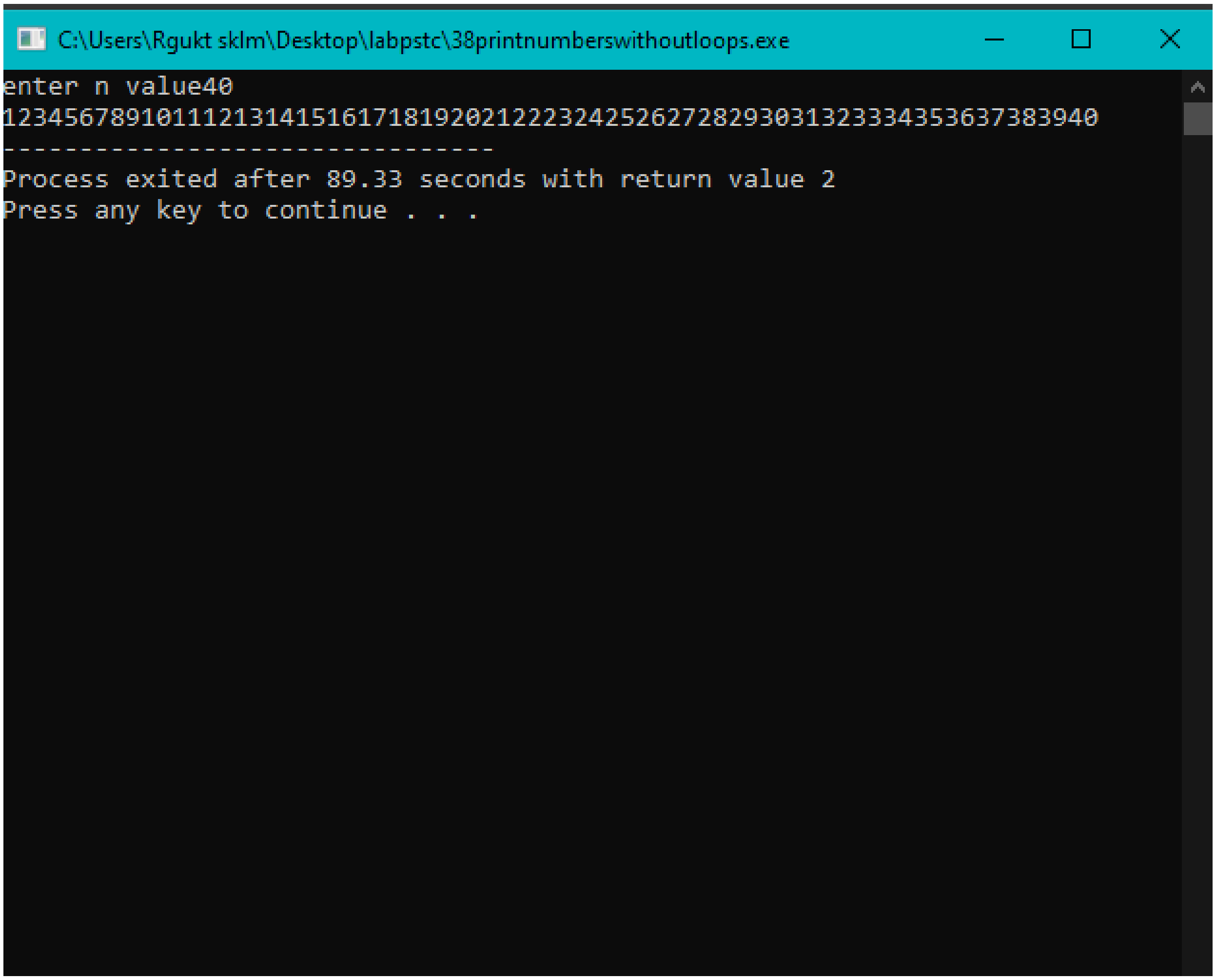
```
what do you want
 give input 1 for multiplication
 give input 2 for division
2

enter 1 st value :5

 enter 2 nd value:9
reminder is 5quotient is 0
 a/b is 0
--------------------------------
Process exited after 5.446 seconds with return value 0
Press any key to continue . . .
```

38. write a program to print the integers from 1 to N and then N to 1 for the given input number ‘N’

```
#include<stdio.h>

void print(int n);
```

```
main()

{

int n;

printf("enter n value");

scanf("%d",&n);

print(n);

}

void print(int n)

{

if(n>=1)

{

print(n-1);

printf("%d",n);

}

}
```

Output:



C:\Users\Rgukt sklm\Desktop\labpstc\38printnumberswithoutloops.exe

```
enter n value40
12345678910111213141516171819202122232425262728293031323334353637383940
--------------------------------
Process exited after 89.33 seconds with return value 2
Press any key to continue . . .
```

39. Write a program to find the X power N(XN) using the user defined recursive function “pow(X,N)”

without using any predefined function from the library?

```
#include<stdio.h>

int power(int a,int b){

if (b>0){

return (a*power(a,b-1));

}

else{

return 1;

}
```

}

int main(){

int a,b,asn;

printf("enter a base number");

scanf("%d",&a);

printf("\nenter exponent number:");

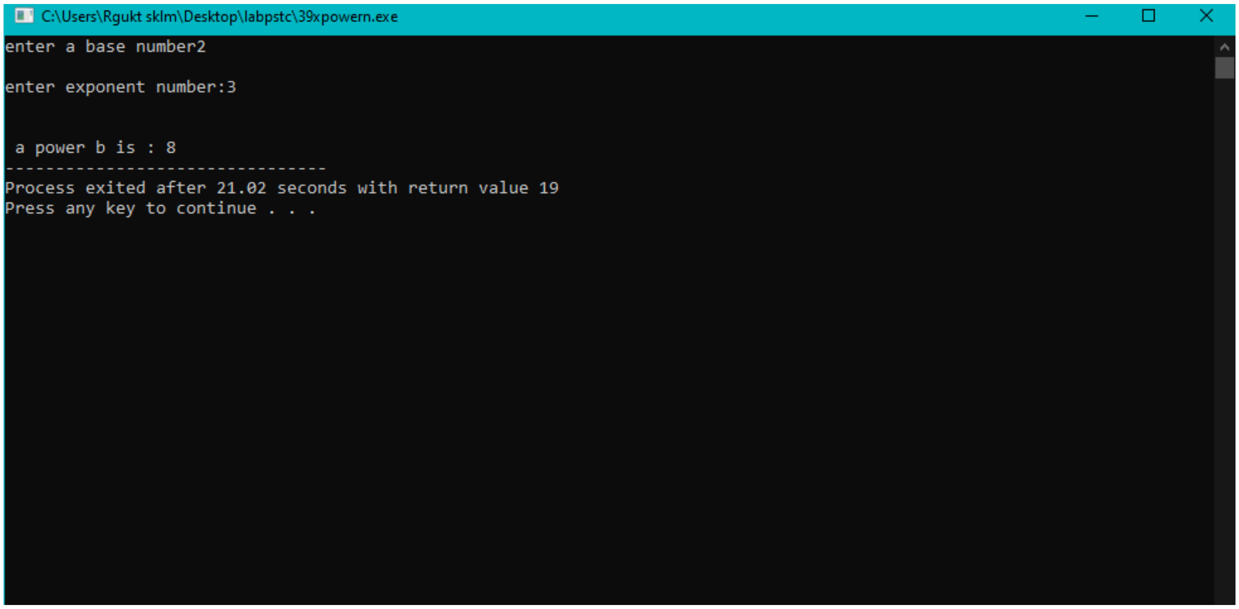
scanf("%d",&b);

asn=power(a,b);

printf("\n\n a power b is : %d",asn);

}

Output:



```
enter a base number2

enter exponent number:3


 a power b is : 8
--------------------------------
Process exited after 21.02 seconds with return value 19
Press any key to continue . . .
```

40. Write a program to find the GCD of two numbers ‘a’ and ‘b’ by defining a recursive function

#include<stdio.h>

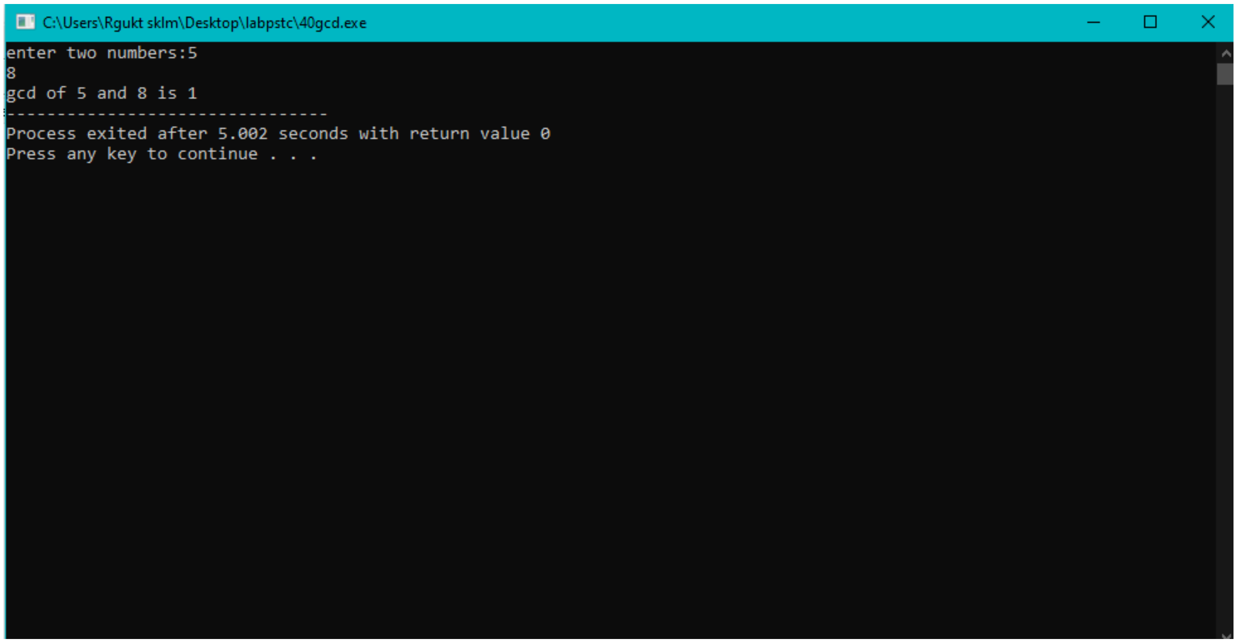
int gcd(int a,int b){

if (a==0){

return b;//if 0 and 13 are give 13 s highest divsior is 13 and 0 s can be devided by any number so 13 is gcd

```
}
else if(b==0){
return a;
}
else if(a==b){
return a;// if both are same then any one a or b is gcd
}
else if(a>b){
return gcd(a-b,b);// if a>b then in order to find out gcd we do need to decrese its value
}
else if(b>a){
return gcd(a,b-a);
}
}
int main(){
int a,b,val;
printf("enter two numbers:");
scanf("%d \n %d",&a,&b);
val=gcd(a,b);
printf("gcd of %d and %d is %d ",a,b,val);
return 0;
}
```

Output:



```
enter two numbers:5
8
gcd of 5 and 8 is 1
--------------------------------
Process exited after 5.002 seconds with return value 0
Press any key to continue . . .
```