G.L.A UNIVERSITY , MATHURA , U.P.

GLA UNIVERSITY

PRACTICAL FILE

SUBMITTED TO: Ms. Gurpreet Kaur Mam

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SECTION : AU-1

UNIVERSITY ROLL NO.:2315000319

CLASS ROLL NO. : 11

BRANCH : BTECH CSE

SUBJECT : C PROGRAMMING LAB

DEPARTMENT NAME : COMPUTER SCIENCE &ENGINEERING

PROJECTS : : : : :

```
#include<stdio.h>
int main()
{

char name [100];
char gender;

int m=0,n=0,o=0,p=0,q=0,select,age;

printf("######Voting System of india ###### \n\n");


start:
while(1)
{

    printf("Enter Voter name :--");
    scanf("%s",&name);

    printf("Enter Gender(M/F) :");
    scanf("%s",&gender);

   printf("Voter's Age :--");
   scanf("%d",&age);

   printf("\n");

printf("###### Verification ######\n \n");

if(gender=='M')
```

```
{
   printf("Voter's Name :Mr.%s\n",name);
}

else if(gender=='F')
{

   printf("Voter's Name : Ms. %s\n",name);
}

else
{
   printf("invalid\n");
   goto start;
}

printf("voter's Age : %d\n \n",age);

if(age<18)
{
      printf("Your Age is less than 18 ,so you are
not eligible.\n");


}
else if(age>18)
{
   printf("******************India political Parties
***************\n \n");

   printf("1-->> National people's parties \n");
   printf("2-->> Bharatiya janata party \n");
   printf("3-->> Indian national Congress \n");
   printf("4-->> Aam jant party \n");
```

```
printf("5-->> Bahujan Samaj party \n");

printf("\n");

printf("**** Select Parties **** ");
scanf("%d",&select);


switch(select)
{

    case 1 :
        m++;
        break;

        case 2 :
        n++;
        break;

        case 3 :
        o++;
        break;

        case 4 :
        p++;
        break;

        case 5 :
        q++;
        break;

        default :
        printf("Out of vote system");
}
```

```
}

else
{
   printf("Invalid age");
   goto start;
}

printf("Are you Sure(Y/N) -->> ");
char ch;
scanf(" %c",&ch);
printf("\n");

if(ch !='Y'){
break;
}

}

printf("^^^^^^^^ Winner Party is  ^^^^^^^^ \n");

if(m>n && m>0 && m>p && m>q)
{
   printf("             National people's
parties\n");

}

else if(n>m && n>0 && n>p && n>q)
{
   printf("              Bharatiya janata party\n");
}
```

```
else if(o>m && o>n && o>p && o>q)
{
   printf("           Indian national Congress\n");
}

else if(p>m && p>n && p>o && p>q)

{
   printf("          Aam  janta party\n");
}

else if(q>m && q>n && q>o && q>p)

{
   printf("            Bahujan Samaj party\n");
}

else
{
   printf("EQUAL VOTES OR No party win");
}

printf("\n Thank you for giving your valuable
time.");

return 0;
}
```

OUTPUT : :: :

```
 ######Voting System of india ######

Enter Voter name :--ANKUR
```

```
Enter Gender(M/F) :M
Voter's Age :--19

###### Verification ######

Voter's Name :Mr.ANKUR
voter's Age : 19

*****************India political Parties
***************

1-->> National people's parties
2-->> Bharatiya janata party
3-->> Indian national Congress
4-->> Aam jant party
5-->> Bahujan Samaj party

**** Select Parties **** 2
Are you Sure(Y/N) -->> Y

Enter Voter name :--TANYA
Enter Gender(M/F) :F
Voter's Age :--39

###### Verification ######

Voter's Name : Ms. TANYA
voter's Age : 39

*****************India political Parties
***************

1-->> National people's parties
2-->> Bharatiya janata party
```

```
3-->> Indian national Congress
4-->> Aam jant party
5-->> Bahujan Samaj party

**** Select Parties **** 2
Are you Sure(Y/N) -->> N

^^^^^^^^ Winner Party is  ^^^^^^^^^
             Bharatiya janata party

 Thank you for giving your valuable time.
```

PROJECTS CODE END : : :

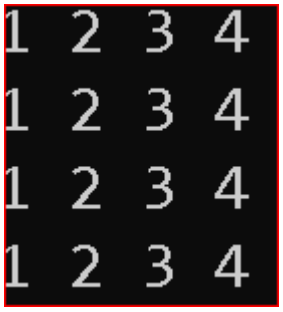
STAR PATTERN

Q. 1

```
#include<stdio.h>
int main()
{
    int n,i,j;
    printf("enter rows : ");
    scanf("%d",&n);

    for(i = 1 ; i <= n ; i++)//4
    {
        for( j = 1 ; j <= n ; j++)
        {
```

```
            printf("%d ",j);
        }
        printf("\n");

    }
    return 0 ;
}
```

Output : ===



Q. 2:

```
#include<stdio.h>
int main()
{
    int n,i,j;
    printf("enter rows : ");
    scanf("%d",&n);

    for(i = 1 ; i <= n ; i++)
    {
        for( j = 1 ; j <= n ; j++)
        {
            printf("* ",j);
```

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

    }
    return 0 ;
}
```

Output :==

```
Enter rows: 5
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
```

```
#include<stdio.h>
int main()
{
    int n,i,j;
    printf("enter rows : ");
    scanf("%d",&n);

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

    }
    return 0 ;
}
```

Output : ==

```
enter rows : 5
*
* *
* * *
* * * *
* * * * *
```

COUNTINUE ……

LOOP QUESTIONS

1. Write a C program to convert given decimal number to binary number.

```
#include<stdio.h>
int main(){
   int rem,rev,var,no,binary=0,i=1;
   printf("Enter the decimal number\n");
   scanf("%d",&no);
   var=no;
while(no!=0)
{
rem=no%2;
no=no/2;
binary=binary+(rem*i);
i=i*10;
}
printf("binary of %d is %d",var,binary);
    return 0;
}
```

OUTPUT

```
Enter the decimal number :15
 binary of 15 is 1111
```

2. Write a C program to find average of all odd number in the given range.

```
#include<stdio.h>
int main(){
   int i,start,end,count=0,sum=0;
   float avg;
   printf("Enter range from start to end\n");
   scanf("%d%d",&start,&end);
   for(i=start;i<=end;i++)
   {
      if(i%2!=0){
```

```
   sum=sum+i;
  count++;
   }
   }
avg=(float)sum/count;
printf("sum is %d and avg is %f",sum,avg);
    return 0;
}
```

OUTPUT

```
Enter range from start to end : 2,25
sum is 1368 and avg is 38.000000
```

3. Write a c program to print n terms of Fibonacci series.

```
#include<stdio.h>
  int main(){
   int i,n,c,a=0,b=1;
   printf("Enter the terms of series\n");
   scanf("%d",&n);
   printf("%d terms of fabonacci series is : ",n);
   for(i=1;i<=n;i++)
   {
   printf("%d ",a);
   c=a+b;
a=b;
   b=c;
   }
return 0;
}
```

```
Enter the terms of series : 5
5 terms of fabonacci series is : 0 1 1 2 3
```

OUTPUT

4. Write a program to find all leap year in the given range of years.

```
#include<stdio.h>
  int main(){
     int year,start,end;
     printf("Enter range from start to end\n");
```

```
    scanf("%d%d",&start,&end);
    printf("leap year between %d and %d is:\n ",start,end);
    for(year=start;year<=end;year++)
    { if(year%400==0||year%4==0){
        printf("%d\t",year); } }
  return 0;
  }
```

OUTPUT

```
Enter range from start to end :2002   2022
leap year between 2002 and 2022 is:
2004            2008            2012            2016            2020
```

5. Write a program to check whether a given number is prime or not.

```
#include<stdio.h>
int main() {
    int i,n,c=0;
    printf("Enter the number that you want to check\n");
    scanf("%d",&n);
    for(i=1;i<n;i++){
      if(i%2==0){
        c++; } }
    if(i==2)
    printf("Number is prime");
    else
    printf("Number is not prime");
     return 0;
  }
```

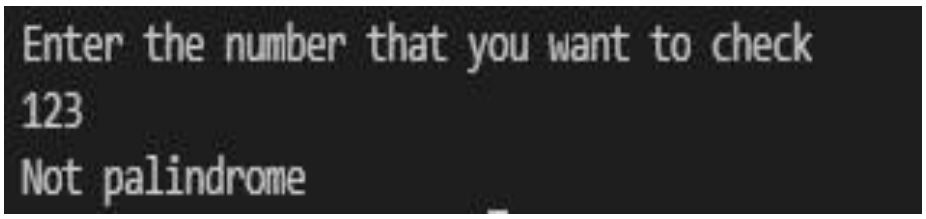
OUTPUT

```
Enter the number that you want to check :23
Number is not prime
```

6. Write a program to find number is palindrome or not.

```
#include<stdio.h>
  int main(){
     int n,i,rem,original,rev=0;
     printf("Enter the number that you want to check\n");
     scanf("%d",&n);
     original=n;
     while(n>0){
        rem=n%10;
        rev=rev*10+rem;
        n=n/10; }
        if(original==n){
        printf("palindrome");}
        else{
        printf("Not palindrome");}
    retur 0;
}
```

OUTPUT

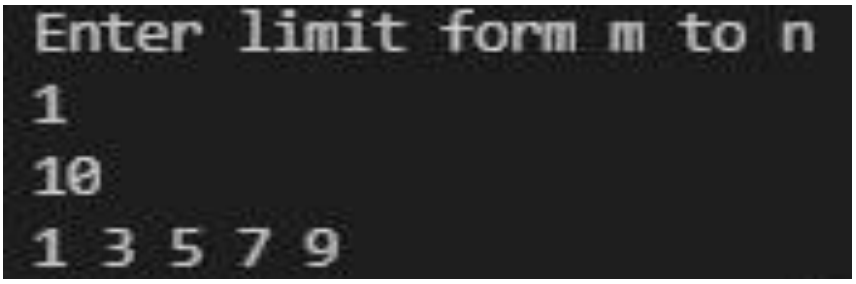


7. Write a program to print all odd numbers from m to n.

```
#include<stdio.h>

int main(){

   int i,j,m,n;

   printf("Enter limit form m to n\n");

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

```
  for(i=m;i<=n;i++)
  { if(i%2==1){
     printf("%d ",i); } }
return 0; }
```

OUTPUT



8. Consider a scenario where user enters numbers continuously and we are supposed to find the sum of all those numbers entered by the user and as the user enters a negative number we must stop him from entering numbers further and print the sum.

Write a C program to accomplish the task

---

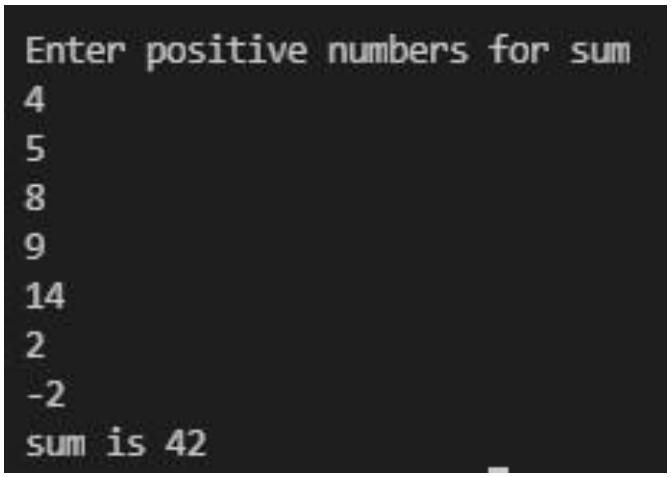
mentioned above.

```
#include<stdio.h>
int main(){
int sum=0,num;
printf("Enter positive numbers for sum\n");
while(1)
 {scanf("%d",&num);
if(num<0)
{ break; }
```

```
sum=sum+num;}
```

```
printf("sum is %d",sum);
return 0; }
```

OUTPUT



1-D ARRAY

1. WAP to input an array of N number of elements and display it.

```
#include<stdio.h>
int main() {
int i,n;
printf("Enter the number of elements \n");
scanf("%d",&n);
int a[n];
for(i=0;i<n;i++) {
printf("enter element %d:",i+1);
scanf("%d",&a[i]); }
printf("Entered elements are : ");
for(i=0;i<n;i++) {
printf("%d ",a[i]);}
return 0;
}
```

OUTPUT

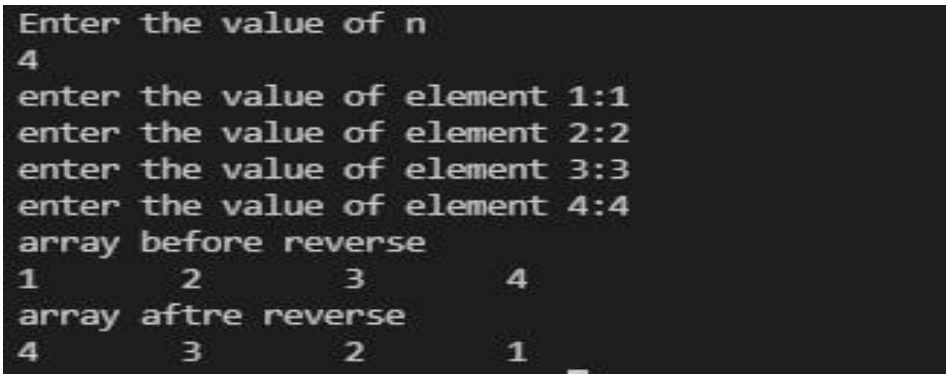
```
Enter the number of elements
4
enter element 1:12
enter element 2:2
enter element 3:34
enter element 4:24
Entered elements are : 12 2 34 24
```

2. WAP to input an array of N number of elements and display it in reverse order.

```
#include<stdio.h>
int main() {
int i,j,k,c,n;
printf("Enter the value of n\n");
scanf("%d",&n);
```

```
int a[n];
for(i=0;i<n;i++) {
printf("enter the value of element %d:",i+1);
scanf("%d",&a[i]); }
printf("array before reverse\n");
for(i=0;i<n;i++) {
printf("%d\t",a[i]); }
k=n;
while(k>=0){
for(j=0;j<k-1;j++) {
c=a[j];
a[j]=a[j+1];
a[j+1]=c; }
k--; }
printf("\narray aftre reverse\n");
for(i=0;i<n;i++) {
printf("%d\t",a[i]); }
return 0; }
```

OUTPUT

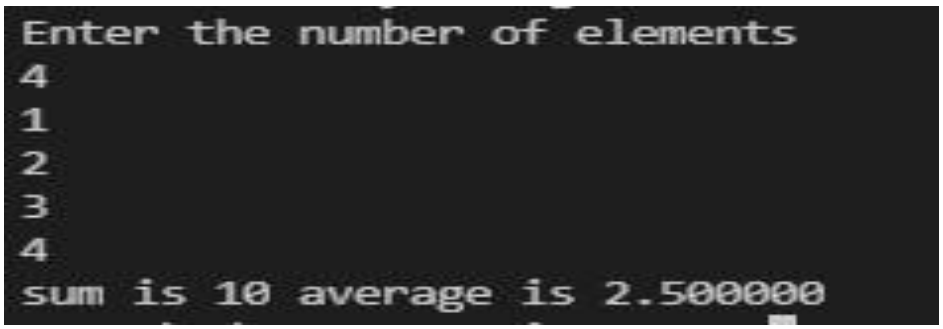


3. WAP to input an array of N number of elements and find the sum and average of all the elements of that array.

```
#include<stdio.h>
int main(){
    int i,n,sum=0;
    float avg;
    printf("Enter the number of elements\n");
    scanf("%d",&n);
    int a[n];
    for(i=0;i<n;i++){
```

```
        scanf("%d",&a[i]); }
      for(i=0;i<n;i++){
        sum+=a[i];
        avg=(float)sum/n; }
printf("sum is %d ",sum);
printf("average is %f ",avg);
return 0; }
```

OUTPUT

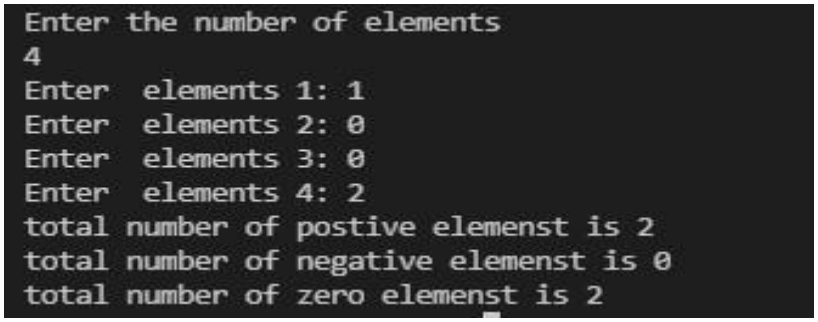


4. WAP to input an array of N number of elements and count total number of positives, negatives and zero elements in that array and display those counts.

```
#include<stdio.h>
int main(){
   int a[100];
   int i,l=0,p=0,n,z=0;
   printf("Enter the number of elements\n");
   scanf("%d",&n);
for(i=0;i<n;i++) {
   printf("Enter elements %d: ",i+1);
   scanf("%d",&a[i]); }
for(i=0;i<n;i++){
   if(a[i]<0)
   { l++; }
   else if (a[i]>0)
   { p++; }
   else if (a[i]==0)
  { z++; } }
    printf("total number of postive elemenst is %d\n",p);
   printf("total number of negative elemenst is %d\n",l);
   printf("total number of zero elemenst is %d\n",z);
```

```
return 0; }
```

OUTPUT

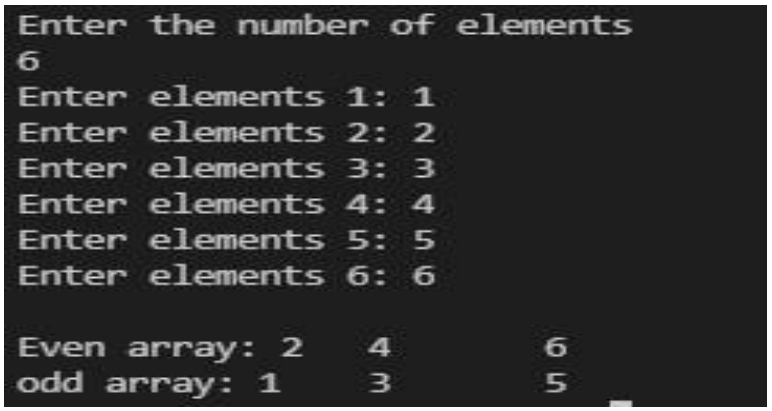


5. WAP to input an array of N number of elements and store all even numbers in 1 array and all odd numbers in another array. Print both the even and odd array separately.

```
#include<stdio.h>
int main(){
   int a[100],b[100],c[100];
   int i,j=0,k=0,n;
   printf("Enter the number of elements\n");
   scanf("%d",&n);
for(i=0;i<n;i++)
{ printf("Enter elements %d: ",i+1);
   scanf("%d",&a[i]); }
for(i=0;i<n;i++) {
if(a[i]%2==0){
   b[j]=a[i];
   j++; }
else{ c[k]=a[i];
   k++; } }
printf("\nEven array: ");
```

```
for(i=0;i<j;i++)
{  printf("%d\t",b[i]);  }
printf("\nodd array: ");
for(i=0;i<k;i++)
{ printf("%d\t",c[i]); }
return 0; }
```

OUTPUT

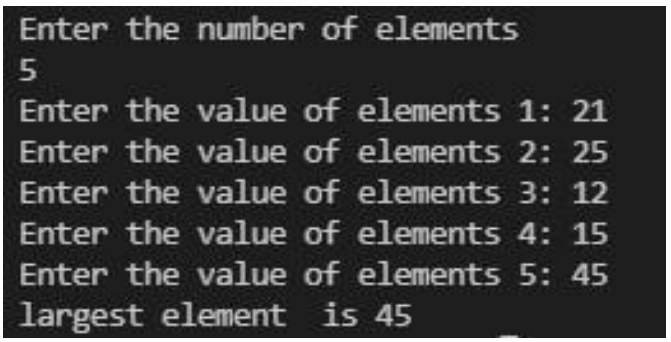


6. WAP to input an array of N number of elements and find the largest element in that array.

```
#include<stdio.h>
int main(){
   int a[100];
   int i,j,n,lar,smal;
   printf("Enter the number of elements\n");
   scanf("%d",&n);
for(i=0;i<n;i++)
{ printf("Enter the value of elements %d: ",i+1);
   scanf("%d",&a[i]); }
lar=a[0];
smal=a[0];
for(i=0;i<n;i++)
{ if(a[i]>lar) {
   lar=a[i];
} }
```

```
printf("largest element  is %d",lar);
return 0;}
```

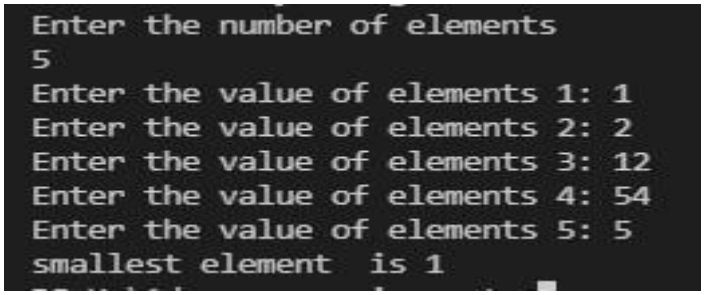
OUTPUT



7. WAP to input an array of N number of elements and find the smallest element in that array.

```
#include<stdio.h>
int main(){
   int a[100];
   int i,j,n,lar,smal;
   printf("Enter the number of elements\n");
   scanf("%d",&n);
for(i=0;i<n;i++)
{ printf("Enter the value of elements %d: ",i+1);
   scanf("%d",&a[i]); }
lar=a[0];
smal=a[0];
for(i=0;i<n;i++)
{ if(a[i]<smal)
{ smal=a[i];   } }
printf("smallest element  is %d",smal);
return 0;}
```

OUTPUT

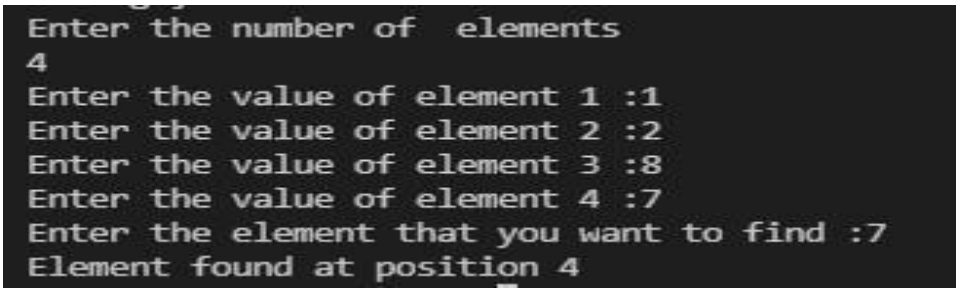


8. WAP to input an array of N number of distinct elements. Input an element you want to search and find it. If found then print the position of that element otherwise print not found.

```
#include<stdio.h>
int main(){
   int a[100],n,count=0,element,i;
   printf("Enter the number of elements\n");
   scanf("%d",&n);
   for(i=0;i<n;i++)
   {    printf("Enter the value of element %d :",i+1);
      scanf("%d",&a[i]); }
   printf("Enter the element that you want to find :");
   scanf("%d",&element);
    for(i=0;i<=n;i++)
    { if(a[i]==element)
       printf("Element found at position %d ",i+1);
       else
      { count++; }
       if(count==1)
```

```
    { printf("element not found");}}
  return 0;}
```

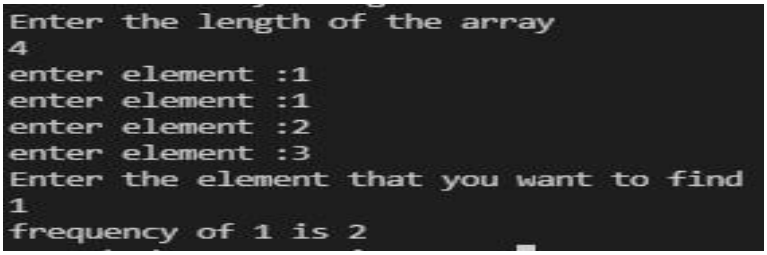
OUTPUT



9. WAP to input an array of N number of elements and find the frequency of an inputted element in that array.

```
 #include<stdio.h>
int main(){
int i,j,n,e,c=0;
int a[100];
printf("Enter the length of the array\n");
scanf("%d",&n);
for(i=0;i<n;i++){
printf("enter element :");
scanf("%d",&a[i]); }
printf("Enter the element that you want to find\n");
scanf("%d",&e);
for(i=0;i<n;i++)
{ if(a[i]==e){
      c++;}}
printf("frequency of %d is %d",e,c);
   return 0;}
```

OUTPUT

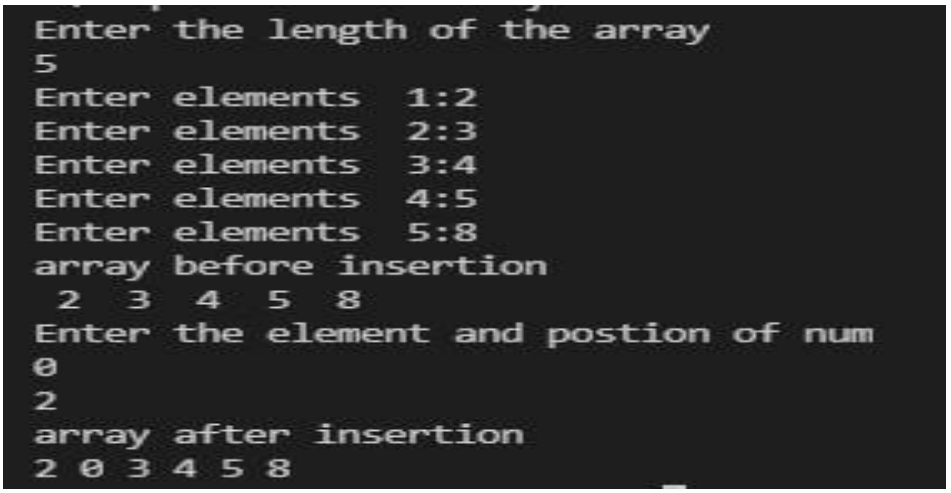


10. WAP to input an array of N number of elements. Input an element you want to insert in that array along with the position and insert it. Print the final array after insertion.

```
#include<stdio.h>
int main(){
int i,j,element,index,position,num;
printf("Enter the length of the array \n");
scanf("%d",&num);
int a[num],b[num];
for(i=0;i<num;i++) {
printf("Enter elements  %d:",i+1);
scanf("%d",&a[i]); }
printf("array before insertion\n");
for(i=0;i<num;i++) {
printf(" %d ",a[i]); }
printf("\nEnter the element and postion of num\n");
scanf("%d%d",&element,&position);
index=position-1;
num++;
for(i=num-1;i>index;i--) {
```

```
a[i]=a[i-1]; }
a[i]=element;
printf("array after insertion\n");
for(i=0;i<num;i++) {
printf("%d ",a[i]); }
return 0; }
```

OUTPUT



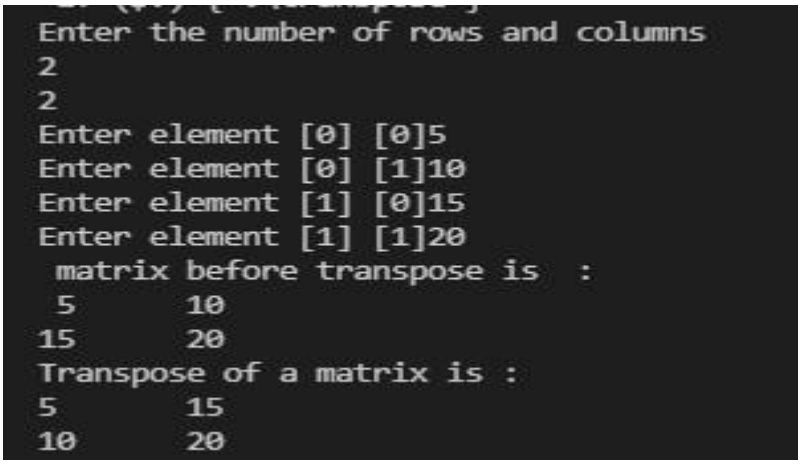
2-D ARRAY

1. WAP to input a 2D array of size M*N and display the transpose of it.

```
#include<stdio.h>
int main() {
 int i,j,row,column,count=0;
int a[10][10],b[10][10];
printf("Enter the number of rows and columns\n");
scanf("%d%d",&row,&column);
for(i=0;i<row;i++) {
   for(j=0;j<column;j++) {
printf("Enter element [%d] [%d]",i,j);
scanf("%d",&a[i][j]); } }
printf(" matrix before transpose is  :\n ");
for(i=0;i<row;i++) {
   for(j=0;j<column;j++) {
printf("%d\t",a[i][j]); }
   printf("\n"); }
for(i=0;i<column;i++) {
   for(j=0;j<row;j++) {
b[i][j]=a[j][i]; } }
printf("Transpose of a matrix is : \n");
for(i=0;i<column;i++) {
   for(j=0;j<row;j++) {
```

```
printf("%d\t",a[j][i]); }
   printf("\n"); }
return 0; }
```

OUTPUT

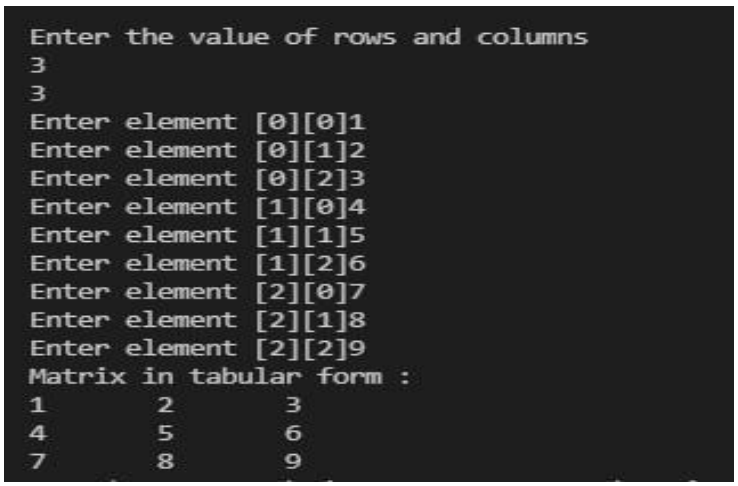


2. WAP to input a 2D array of size M*N and display it in tabular form.

```
#include<stdio.h>
int main(){
   int i,j,n,rows,columns;
   int a[20][20];
   printf("Enter the value of rows and columns\n");
   scanf("%d%d",&rows,&columns);
   for(i=0;i<rows;i++){
      for(j=0;j<columns;j++){
         printf("Enter element [%d][%d]",i,j);
         scanf("%d",&a[i][j]);} }
   printf("Matrix in tabular form :\n");
      for(i=0;i<rows;i++){
```

```
    for(j=0;j<columns;j++){
        printf("%d\t",a[i][j]); }
    printf("\n"); }
return 0; }
```

OUTPUT



3. WAP to input a 2D array of size M*N and display boundary elements in matrix form.

```
#include<stdio.h>
int main(){
int i,j,row,column;
printf("Enter the number of row and column\n");
scanf("%d%d",&row,&column);
int a[row][column];
for(i=0;i<row;i++) {
for(j=0;j<column;j++){
   printf("Enter element [%d][%d]",i,j);
scanf("%d",&a[i][j]); }}
printf("boundry elements of matrix :\n");
```

```
for(i=0;i<row;i++) {
for(j=0;j<column;j++){
if(i==0||j==0||i==row-1||j==row-1){
printf("%d",a[i][j]);}
else {
printf(" ");}}
printf("\n");}
return 0; }
```

OUTPUT

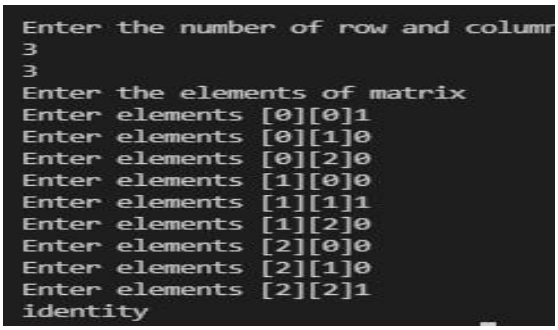
```
Enter the number of row and column
4
4
Enter element [0][0]1
Enter element [0][1]2
Enter element [0][2]3
Enter element [0][3]4
Enter element [1][0]1
Enter element [1][1]2
Enter element [1][2]3
Enter element [1][3]4
Enter element [2][0]1
Enter element [2][1]2
Enter element [2][2]3
Enter element [2][3]4
Enter element [3][0]1
Enter element [3][1]2
Enter element [3][2]3
Enter element [3][3]4
boundry elements of matrix :
1234
1  4
1  4
```

4. WAP to input a matrix and check if its identity matrix or not.

```
#include<stdio.h>
int main(){
int i,j,row,column,c=1;
printf("Enter the number of row and columns\n");
```

```
scanf("%d%d",&row,&column);
int a[5][5],b[5][5];
printf("Enter the elements of matrix\n");
for(i=0;i<row;i++) {
   for(j=0;j<column;j++) {
   printf("Enter elements [%d][%d]",i,j);
   scanf("%d",&a[i][j]); } }
for(i=0;i<row;i++) {
   for(j=0;j<column;j++) {
 if(i==j&&a[i][j]!=1){
   c++;
   break; }
   else if (i!=j && a[i][j]!=0){
      c++;
      break; } } }
if(c==1) {
printf("identity\n"); }
else{ printf("not identity\n"); }
return 0; }
```

OUTPUT

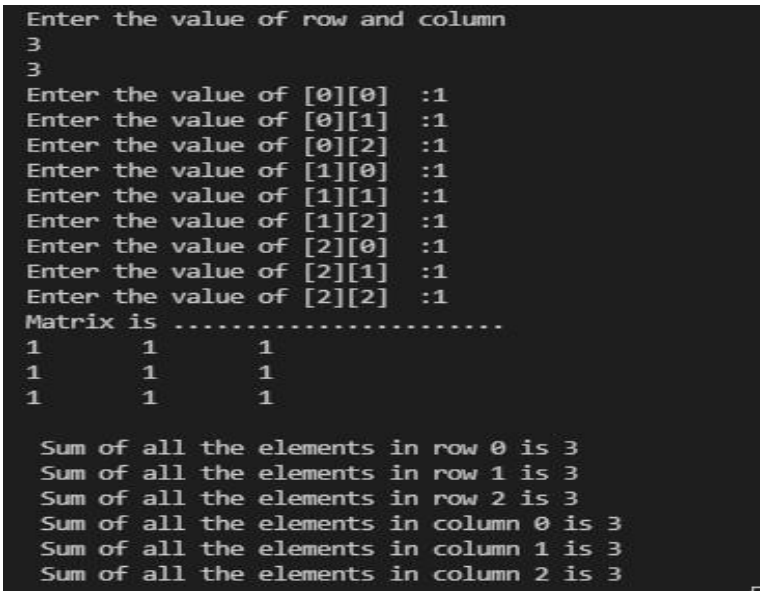


5. WAP to input a 2D array of size M*N and find the sum of individual rows and individual columns.

```
#include<stdio.h>
int main(){
int i,j,row,column,rowsum,columnsum,temp=0;
printf("Enter the value of row and column\n");
scanf("%d%d",&row,&column);
int a[row][column];
for(i=0;i<row;i++) {
for(j=0;j<column;j++) {
   printf("Enter the value of [%d][%d]  :",i,j);
scanf("%d",&a[i][j]); } }
printf("Matrix is ..... \n");
for(i=0;i<row;i++) {
for(j=0;j<column;j++) {
printf("%d\t",a[i][j]); }
printf("\n"); }
for(i=0;i<row;i++)
{   rowsum=0;
   for(j=0;j<column;j++) {
rowsum+=a[i][j]; }
   printf("\n Sum of all the elements in row %d is %d ",i,rowsum); }
for(i=0;i<row;i++)
{   columnsum=0;
   for(j=0;j<column;j++) {
```

```
columnsum+=a[j][i]; }
    printf("\n Sum of all the elements in column %d is %d ",i,columnsum);
}
return 0;}
```

OUTPUT



6. WAP to input 2 matrices from the user and add them.

```
#include<stdio.h>
int main(){
   int i,j,row,columns;
   int a[20][20],c[20][20],b[20][20];
   printf("Enter the number of row and columns\n");
   scanf("%d%d",&row,&columns);
   if(row==columns){
   printf("Enter element of 1st matrix :\n");
   for(i=0;i<row;i++){
      for(j=0;j<columns;j++){
         printf("Enter element [%d][%d]",i,j);
         scanf("%d",&a[i][j]); } }
   printf("Enter element of 2nd matrix :\n");
    for(i=0;i<row;i++){
      for(j=0;j<columns;j++){
```

```
        printf("Enter element [%d][%d]",i,j);
        scanf("%d",&b[i][j]); } }
   for(i=0;i<row;i++){
   for(j=0;j<columns;j++){
      c[i][j]=a[i][j]+b[i][j]; } }
    for(i=0;i<row;i++){
    for(j=0;j<columns;j++){
      printf("%d\t",c[i][j]); }
    printf("\n"); } }
  else
  printf("addition not possible");
   return 0; }
```

OUTPUT

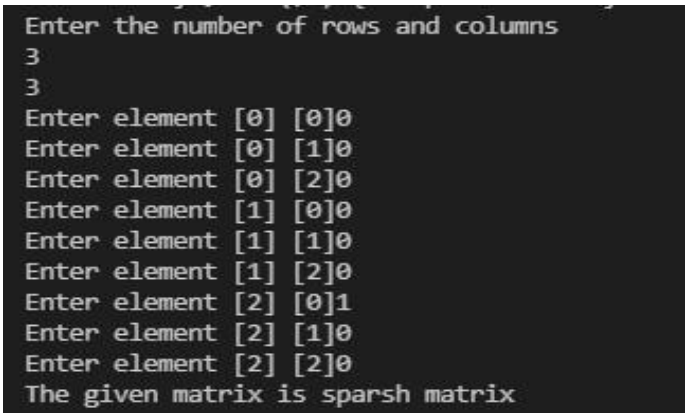
```
Enter the number of row and columns
2
2
Enter element of 1st matrix :
Enter element [0][0]1
Enter element [0][1]2
Enter element [1][0]3
Enter element [1][1]1
Enter element of 2nd matrix :
Enter element [0][0]2
Enter element [0][1]2
Enter element [1][0]2
Enter element [1][1]2
3       4
5       3
```

7. WAP to input a matrix of order M*N and check if it's sparse or dense matrix.

```
#include<stdio.h>
int main(){
   int i,j,row,column,count=0;
int a[10][10];
printf("Enter the number of rows and columns\n");
scanf("%d%d",&row,&column);
for(i=0;i<row;i++)
{ for(j=0;j<column;j++)
   {  printf("Enter element [%d] [%d]",i,j);
      scanf("%d",&a[i][j]);
      if(a[i][j]==0){
```

```
        count++; } } }
      if(count>(row*column)/2){
   printf("The given matrix is sparsh matrix\n"); }
else
{ printf("The matrix is dense"); }
return 0; }
```

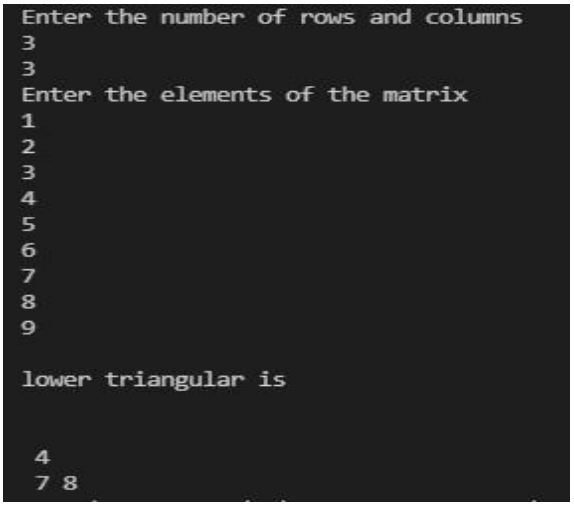
OUTPUT



8. WAP to input a matrix and print its Lower triangular matrix.

```
#include<stdio.h>
int main(){
   int i,j,row,column;
   printf("Enter the number of rows and columns\n");
   scanf("%d%d",&row,&column);
   int a[10][10];
   printf("Enter the elements of the matrix\n");
   for(i=0;i<row;i++)
   { for(j=0;j<column;j++)
      { scanf("%d",&a[i][j]); }    }
 printf("\nlower triangular is\n");
 for(i=0;i<row;i++)
  { printf("\n");
     for(j=0;j<column;j++)
     { if(i>j){
        printf("%2d",a[i][j]); }
     else{ printf(" "); } } }
   return 0; }
```

OUTPUT

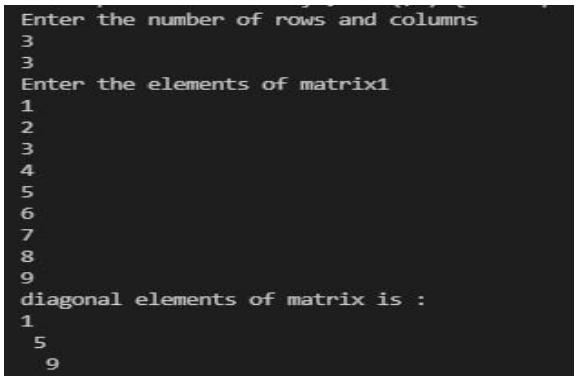


9. WAP to input a 2D array and display diagonal elements in matrix form.

```
#include<stdio.h>
int main(){
int i,j,row,size,column,c=0, a[6][6];
printf("Enter the number of rows and columns\n");
scanf("%d%d",&row,&column);
printf("Enter the elements of matrix1\n");
for(i=0;i<row;i++)
{  for(j=0;j<column;j++)
{  scanf("%d",&a[i][j]);} }
printf("diagonal elements of matrix is :\n");
 for(i=0;i<row;i++)
{  for(j=0;j<column;j++)
{ if(i==j)
{ printf("%d\t",a[i][j]); }
```

```
else {  printf(" "); } }
printf("\n"); }
return 0; }
```

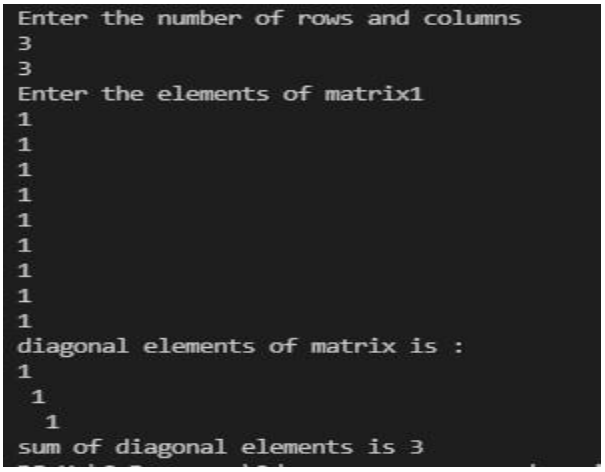
OUTPUT



10. WAP to input a 2D array and find the sum of its diagonal elements.

```
#include<stdio.h>
 int main(){
int i,j,row,size,column,c=0;
printf("Enter the number of rows and columns\n");
scanf("%d%d",&row,&column);
int a[6][6],sum=0;
printf("Enter the elements of matrix1\n");
for(i=0;i<row;i++)
{ for(j=0;j<column;j++)
{  scanf("%d",&a[i][j]); } }
printf("diagonal elements of matrix is :\n");
 for(i=0;i<row;i++)
{ for(j=0;j<column;j++) {
if(i==j)
{ printf("%d\t",a[i][j]);
   sum=sum+a[i][j]; }
else {
   printf(" ");} }
printf("\n");}
printf("sum of diagonal elements is %d",sum);
return 0; }
```

OUTPUT

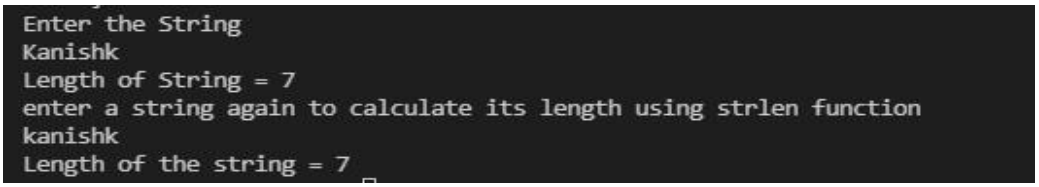

Enter the number of rows and columns
3
3
Enter the elements of matrix1
1
1
1
1
1
1
1
1
1
diagonal elements of matrix is :
1
1
1
sum of diagonal elements is 3

STRING

1. Write a C program to find length of a string with and without function.

```
#include <stdio.h>
#include <string.h>
int main() {
 char a[100];
 int length;
 char str[100];
 int i;
 printf("Enter the String\n");
 gets(str);
 for (i = 0; str[i] != '\0'; ++i);
 printf("Length of String = %d\n", i);
 printf("enter a string again to calculate its length using strlen function\n");
 scanf("%s", a);
 length = strlen(a);
 printf("Length of the string = %d\n", length);
 return 0;}
```

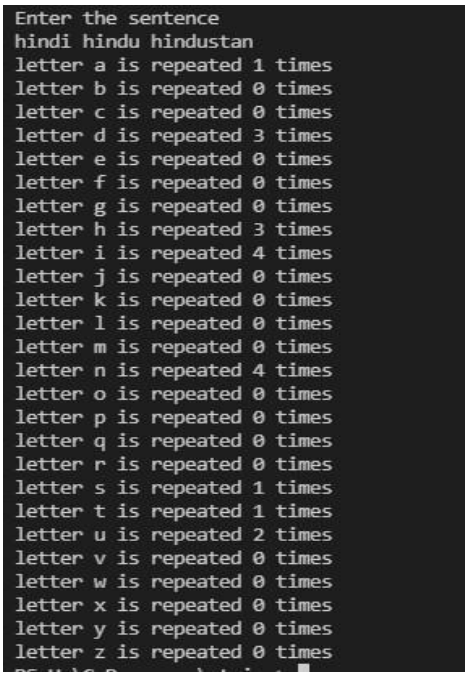
OUTPUT



2. Write a C program to count frequency of each character in a string.

```
#include<stdio.h>
int main(){
   int i,b,count=0;
   char c;
   char a[100];
   printf("Enter the sentence\n");
   gets(a);
 for(b='a';b<='z';b++)
 { count=0;
  for(i=0;a[i]!='\0';i++)
   {   if(a[i]==b)
      {  count++;  } }
   printf("letter %c is repeated %d times\n",b,count);
   }  return 0; }
```

OUTPUT



3. Write a C program to count total number of words in a string.

```
#include<stdio.h>
int main(){
   int i,count=1;
   char a[30];
   printf("Enter the sentence\n");
   gets(a);
   for(i=0;a[i]!='\0';i++)
   { if(a[i]==' ')
      { count++; } }
   printf("words in this sentence is %d",count);
   return 0; }
```

OUTPUT

```
Enter the sentence
GOVIND SHARMA
words in this sentence is 2
```

4. Write a C program to count total number of vowels and consonants in a string.

```
#include<stdio.h>
int main(){
   int i,count=0,cs=0;
   char a[30];
   printf("Enter the string\n");
   gets(a);
   for(i=0;a[i]!='\0';i++)
   {
```

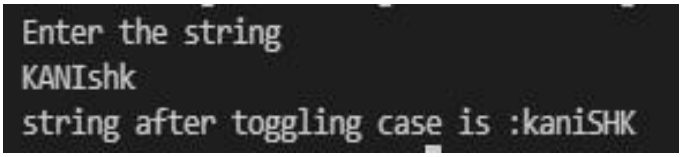
```
if(a[i]=='A'||a[i]=='a'||a[i]=='e'||a[i]=='E'||a[i]=='I'||a[i]=='i'||a[i]=='o'
||a[i]=='O'||a[i]=='u'||a[i]=='U')
   { count++; }
   else { cs++; }}
   printf(" total vowels is %d and consonents is %d",count,cs++);
    return 0; }
```

OUTPUT

5. Write a C program to toggle case of each character of a string.

```
#include<stdio.h>
#include<string.h>
int main(){
  char a[100];
  int i;
  printf("Enter the string\n");
  gets(a);
  for(i=0;a[i]!='\0';i++){
     if(a[i]>='a'&&a[i]<='z'){
        a[i]-=32; }
   else if(a[i]>='A'&&a[i]<='Z'){
        a[i]+=32; } }
  printf("string after toggling case is :");
  puts(a);
   return 0; }
```

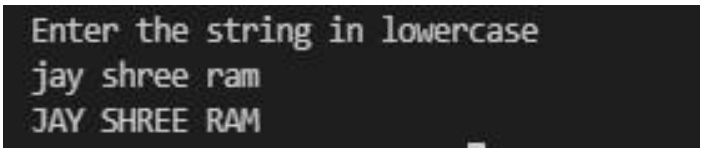
OUTPUT



6. Write a C program to convert lower case string to uppercase.

```
#include<stdio.h>
#include<string.h>
int main(){
 char a[30];
   printf("Enter the string in lowercase\n");
   gets(a);
   strupr(a);
printf("%s",a);
return 0; }
```

OUTPUT

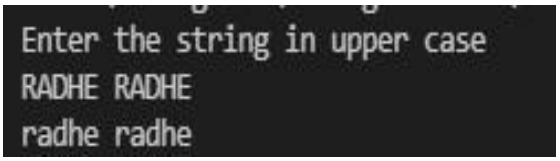


7. Write a C program to convert upper case string to lower case .

```
#include<stdio.h>
#include<string.h>
int main(){
char a[30];
printf("Enter the string in upper case \n");
gets(a);
   strlwr(a);
```

```
printf("%s",a);
return 0; }
```

OUTPUT



8.Write a C program to find total number of alphabets ,digits or special character in a string.

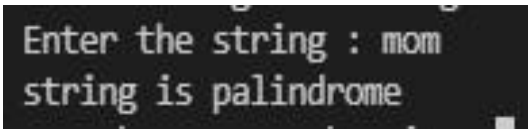
```
#include<stdio.h>
int main(){
char a[100];
int dgt=0,alp=0,spc=0;
printf("Enter the string\n");
gets(a);
for(int i=0;a[i]!='\0';i++){
   if(a[i]>=65 && a[i]<=90|| a[i]>=97 && a[i]<=122)
   alp++;
   else if (a[i]>=48 && a[i]<=57)
   dgt++;
   else
   spc++; }
printf(" total no alphabet is %d ",alp);
printf(" \ntotal no digits  is %d ",dgt);
printf(" \ntotal no special character is %d ",spc);
   return 0; }
```

OUTPUT

9. Write a C program to check whether a string is palindrome or not.

```
#include<stdio.h>
#include <string.h>
int main()
{ char a[100];
 int i,n,c=0;
 printf("Enter the string : ");
 gets(a);
 n=strlen(a);
 for(i=0;i<n/2;i++)
 { if(a[i]==a[n-i-1])
 c++;}
if(c==i)
 printf("string is palindrome");
 else
 printf("string is not palindrome");
return 0; }
```

OUTPUT

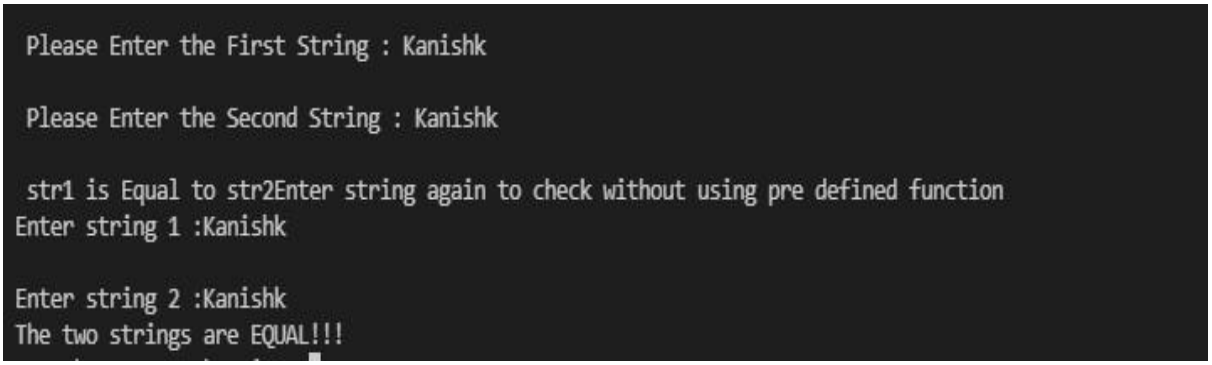


10. Write a C program to compare two strings with and without function.

```
#include <stdio.h>
#include <string.h>
int main()
{ char Str1[100],Str2[100];
char stri1[100],stri2[100];
int result, i;
printf("\n Please Enter the First String : ");
gets(Str1);
printf("\n Please Enter the Second String : ");
gets(Str2);
for(i = 0; Str1[i] == Str2[i] && Str1[i] == '\0'; i++);
if(Str1[i] < Str2[i])
{ printf("\n str1 is Less than str2");}
else if(Str1[i] > Str2[i])
 { printf("\n str2 is Less than str1");}
else
 { printf("\n str1 is Equal to str2");}
 printf("Enter string again to check without using pre defined function");
 printf("\nEnter string 1 :");
gets(stri1);
printf("\nEnter string 2 :");
gets(stri2);
if(strcmp(stri1,stri2)==0)
{ printf("The two strings are EQUAL!!!\n");}
else
 {printf("The two string are NOT EQUAL!!!\n");}
```

return 0;}

OUTPUT

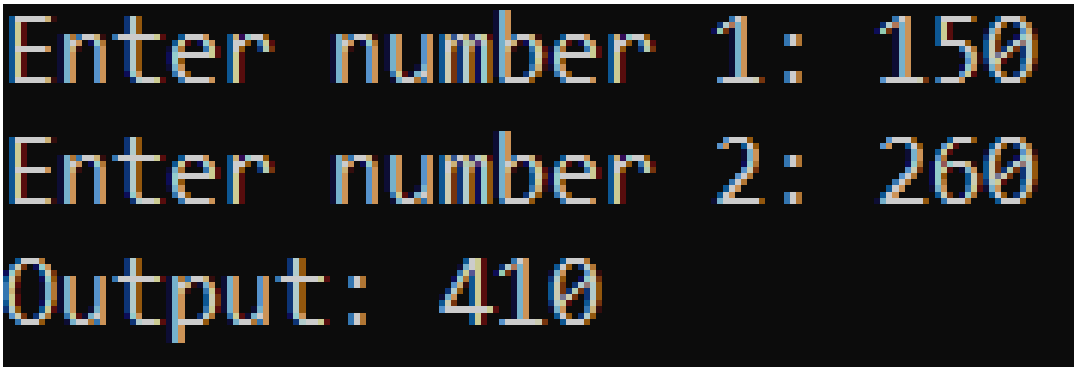


FUNCTION

1- Write a c program user defined function addition().

```
#include <stdio.h>
int addition(int num1, int num2)
{
   int sum;
   sum = num1+num2;
   return sum;
}

int main()
{
    int var1, var2;
   printf("Enter number 1: ");
   scanf("%d",&var1);
   printf("Enter number 2: ");
   scanf("%d",&var2);
   int res = addition(var1, var2);
   printf ("Output: %d", res);
   return 0;
}
```

OUTPUT



2- Write a program to swap two numbers using call by value.

```
#include<stdio.h>
void swap(int a,int b){
   int t=a;
   a=b;
   b=t;
   printf("\nvalues of a = %d and b=%d after swap ",a,b); }
int main(){
   int a,b;
   printf("Enter the value of a and b\n");
   scanf("%d%d",&a,&b);
    printf("values of a = %d and b=%d before swap ",a,b);
    swap(a,b);
    printf("\nnow value of a=%d and b=%d",a,b);
    return 0; }
```

OUTPUT

```
Enter the value of a and b
2
3
values of a = 2 and b=3 before swap
values of a = 3 and b=2 after swap
now value of a=2 and b=3
```

3- Write a program to calculate binomial coefficient using function.

```
#include<stdio.h>
int c(int n, int k);
int main()
{  int n,k;
```

```
    printf("Enter n and k : ");
    scanf("%d%d",&n,&k);
    printf("\nBinomial coefficient\n",c(n,k));
    printf("%d\n",c(n,k));
    return 0;}
int c(int n, int k) {
    if(k==0 || k==n)
        return 1;
    return c(n-1,k-1) + c(n-1,k); }
```

OUTPUT

```
Enter n and k : 5
2

Binomial coefficient
10
```

4- .What do you mean by call by value ?Give one example.

call by value : In this parameter passing method, values of actual parameters are copied to function's formal parameters and the two types of parameters are stored in different memory locations. So any changes made inside functions are not reflected in actual parameters of caller.

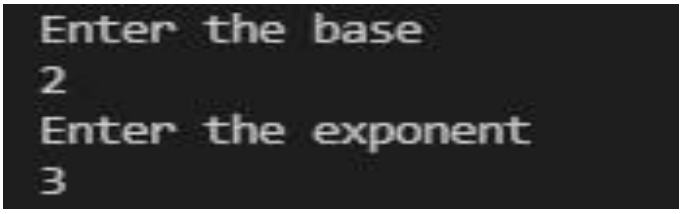
Ex-swapping of two numbers

5- Write a program to calculate x^n without using library function pow() but using user defined function.

```
#include<stdio.h>

void power(int,int);
```

```
 void main() {
    int b,e;
    printf("Enter the base\n");
    scanf("%d",&b);
    printf("Enter the exponent\n");
    scanf("%d",&e);
    power(b,e);}
void power(int b,int e){
    int power=1;
    while(e>0)
    { power=power*b;
       e--; }
    printf("The power of the given number is %d",power); }
```

OUTPUT



6- Write a program in C to print all perfect numbers in given range using the function

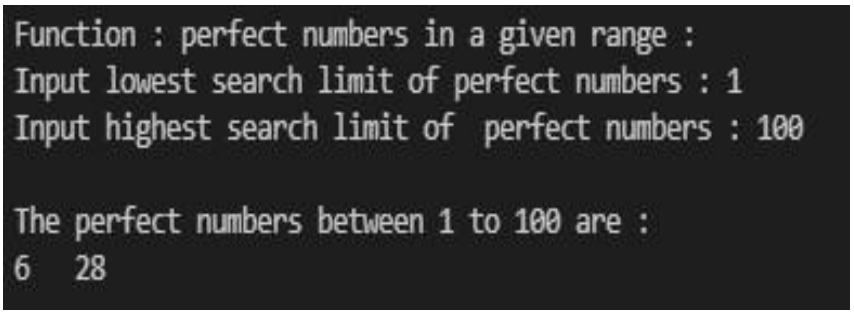
```
#include <stdio.h>
int checkPerfect(int n1);
void PerfectNumbers(int stLimit, int enLimit);

int main()
```

```
{
   int stLimit, enLimit;
        printf("\n\n Function : perfect numbers in a given range :\n");
      printf(" Input lowest search limit of perfect numbers : ");
```

```
    scanf("%d", &stLimit);
    printf(" Input highest search limit of  perfect numbers : ");
    scanf("%d", &enLimit);


    printf("\n The perfect numbers between %d to %d are : \n", stLimit,
enLimit);
    PerfectNumbers(stLimit, enLimit);
    printf("\n\n");
    return 0;
}
 int checkPerfect(int n1)
{
    int i, sum;


    sum = 0;
    for(i=1; i<n1; i++)
    {
        if(n1 % i == 0)
        {
            sum += I; } }
    if(sum == n1)
        return 1;
    else
        return 0; } void PerfectNumbers(int stLimit, int enLimit)
{ while(stLimit <= enLimit)
    {
        if(checkPerfect(stLimit))
        {      printf(" %d  ", stLimit);
```

```
 }stLimit++;
} }
```

OUTPUT



7- write a c program using function to check weather the number is prime or not.

```
#include <stdio.h>
void prime();
void prime(int n)
{ int i, count = 0;
   for (i = 1; i < n; i++) {
   if (n % i == 0)
      { count++;    } }
   if (count == 1)
      printf("prime\n");
   else
   { printf("not prime\n"); } }
void main()
{
   int n;
   printf("Enter the value of n\n");
   scanf("%d", &n);
   prime(n); }
```

OUTPUT