ASSIGNMENT-7

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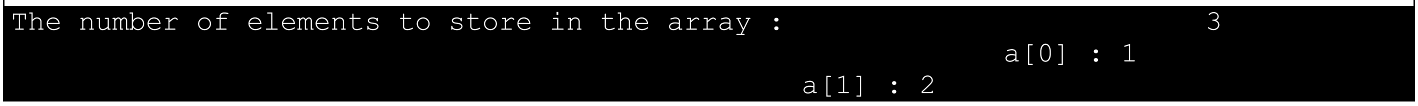
Q1) read n number of values in an array and display it in reverse order.

ANSWER

```
#include <stdio.h>

void main()

{

   int i,n,a[100];

 printf("The number of elements to store in the array :\n");

   scanf("%d",&n);

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

      {

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

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

               }

    printf("\nThe values store into the array are : \n");

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

     {

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

              }

printf("\n\nThe values store into the array in reverse are :\n");

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

      {

                Printf("%  d",a[i]);

               }

  }
```

OUTPUT



```
The number of elements to store in the array :                    3
                                                        a[0] : 1
                                              a[1] : 2
```

```
                                        a[2] : 3
                            The values store into the array are :
 1  2  3
The values store into the array in reverse are :

  3  2  1
```

Q2) find the sum of all elements of the array.

ANSWER

```
#include <stdio.h>
void main()
{
   int a[30];
   int i, n, sum=0;
  printf("Input the number of elements:");
      scanf("%d",&n);
   for(i=0;i<n;i++)
       {
                 printf("a[%d] : ",i);
                 scanf("%d",&a[i]);
               }

   for(i=0; i<n; i++)
   {
       sum += a[i];
   }

   printf("Sum of all elements is: %d", sum);
}
```

OUTPUT

```
Input the number of elements:4

a[0] : 5

a[1] : 7

a[2] : 8
```

```
a[3] : 0

Sum of all elements is: 20
```

Q3) copy the elements of one array into another array.

ANSWER

```
#include <stdio.h>
void main()
{
   int a[50], b[60];
   int i, n;
      printf("Input the number of elements:");
      scanf("%d",&n);
      for(i=0;i<n;i++)
       {
                printf("a[%d] : ",i);
                scanf("%d",&a[i]);
               }
   for(i=0; i<n; i++)
   {
       b[i] = a[i];
   }
   printf("copied elements are:\n");
   for(i=0; i<n; i++)
   {
       printf("% d", b[i]);
   }
}
```

OUTPUT

```
Input the number of elements:5

a[0] : 7
```

```
a[1] : 8

a[2] : 9

a[3] : 0

a[4] : 5

copied elements are:
7 8 9 0 5
```

Q4) count a total number of duplicate elements in an array.

ANSWER

```
#include <stdio.h>

int main()

{

   int arr[6];

   int i, j, size, count = 0;

    printf("Enter array size : ");

    scanf("%d", &size);

   printf("Enter elements in array : ");

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

   {

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

   }

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

   {

      for(j=i+1; j<size; j++)

      {

         if(arr[i] == arr[j])

{

count++;

  break;

         }

      }

   }
   printf("\nTotal number of duplicate elements found in array = %d", count);


   return 0;
}
```

Output

```
Enter array size : 5

Enter elements in array : 2 3 5 5 7 7



Total number of duplicate elements found in array = 1
```

Q5) find the maximum and minimum element in an array.

ANSWER

```c
#include <stdio.h>


void main()
{
   int arr[100];
   int i,max,min,n;


     printf("Number of elements :");
     scanf("%d",&n);
     for(i=0;i<n;i++)
         {
             printf("a[%d] : ",i);
             scanf("%d",&arr[i]);
            }




   max = arr[0];
   min = arr[0];


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

```
    {
        if(arr[i]>max)
        {
            max = arr[i];
        }



        if(arr[i]<min)
        {
            min = arr[i];
        }
    }
    printf("Maximum element is : %d\n", max);
    printf("Minimum element is : %d", min);
}
```

Output

```
Number of elements :4

a[0] : 7777777

a[1] : 89098

a[2] : 0

a[3] : 8

Maximum element is : 7777777

Minimum element is : 0
```

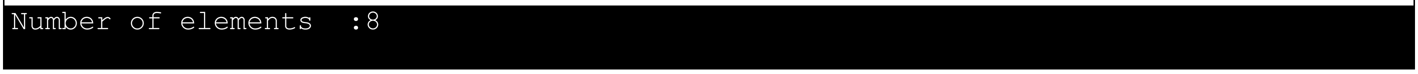
Q6) separate odd and even integers in separate arrays.

ANSWER

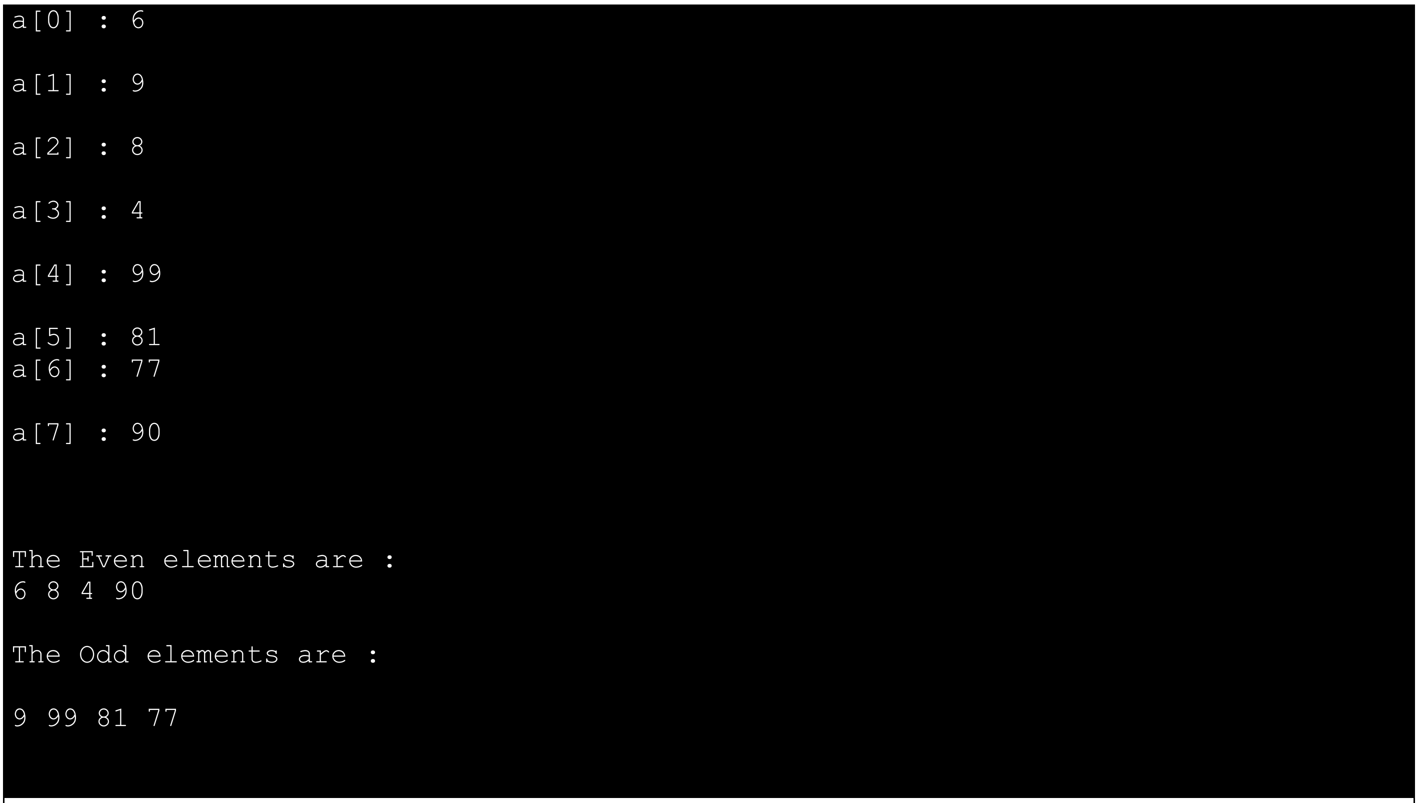
```
#include <stdio.h>


void main()
 {
    int a[10],b[10],c[10];
    int i,j=0,k=0,n;
printf("Number of elements  :");
```

```
      scanf("%d",&n);
      for(i=0;i<n;i++)
         {
printf("a[%d] : ",i);
            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("\nThe Even elements are : \n");
   for(i=0;i<j;i++)
   {
          printf("%d ",b[i]);
   }
   printf("\nThe Odd elements are :\n");
   for(i=0;i<k;i++)
   {
          printf("%d ", c[i]);
   }
 }
```

Output



```
Number of elements   :8
```



```
a[0] : 6

a[1] : 9

a[2] : 8

a[3] : 4

a[4] : 99

a[5] : 81
a[6] : 77

a[7] : 90



The Even elements are :
6 8 4 90

The Odd elements are :

9 99 81 77
```

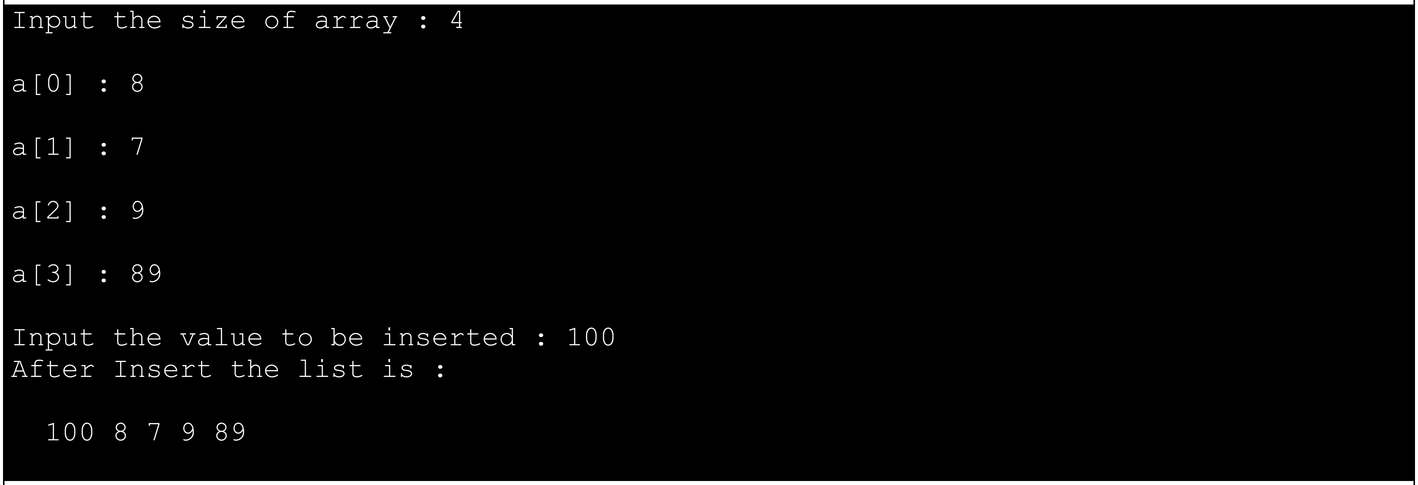
Q7) insert New value in the array.

ANSWER

```
#include <stdio.h>


void main()

{

  int arr1[50],i,n,p,inval;



   printf("Input the size of array : ");

   scanf("%d", &n);

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

        {

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

               scanf("%d",&arr1[i]);

             }

  printf("Input the value to be inserted : ");

  scanf("%d",&inval);

  printf("The exist array list is :\n ");

  for(i=0;i<n;i++)
```

```
     printf(" %d",arr1[i]);
  for(i=0;i<n;i++)
    if(inval<arr1[i])
    {
      p = i;
      break;
    }
  for(i=n;i>=p;i--)
     arr1[i]= arr1[i-1];
     arr1[p]=inval;


     printf("\n\nAfter Insert the list is :\n ");
  for(i=0;i<=n;i++)
     printf(" %d",arr1[i]);
}
```

Output



```
Input the size of array : 4

a[0] : 8

a[1] : 7

a[2] : 9

a[3] : 89

Input the value to be inserted : 100
After Insert the list is :

  100 8 7 9 89
```

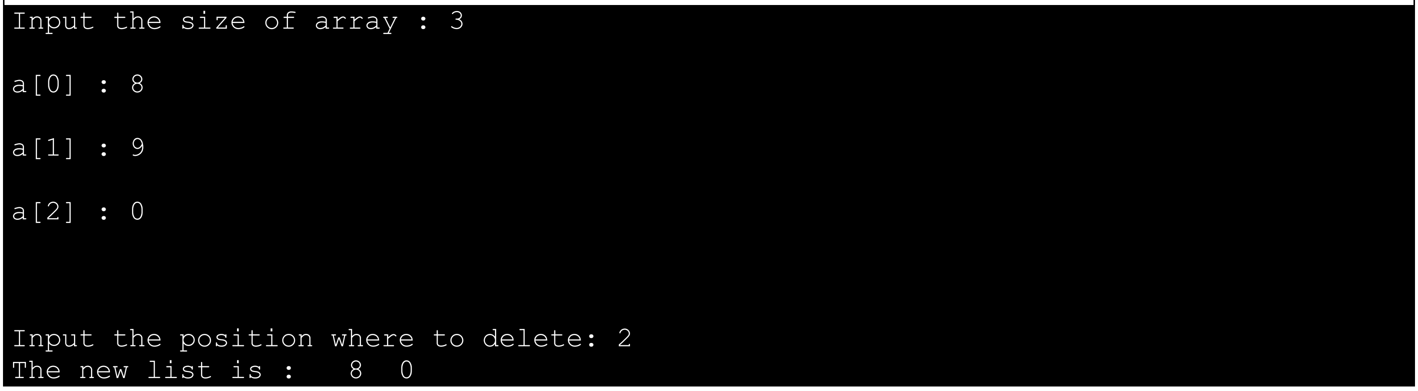
Q8) delete an element at desired position from an array.

ANSWER

```
#include <stdio.h>


void main(){
  int arr1[50],i,pos,n;
      printf("Input the size of array : ");
      scanf("%d", &n);
```

```
    for(i=0;i<n;i++)
        {
              printf("a[%d] : ",i);
              scanf("%d",&arr1[i]);
             }

 printf("\nInput the position where to delete: ");
 scanf("%d",&pos);
 i=0;
 while(i!=pos-1)
        i++;
 while(i<n)
 {
        arr1[i]=arr1[i+1];
        i++;
 }
 n--;
  printf("\nThe new list is : ");
 for(i=0;i<n;i++)
      {
                   printf("  %d",arr1[i]);
                 }
        printf("\n\n");

}
```

Output



```
Input the size of array : 3

a[0] : 8

a[1] : 9

a[2] : 0



Input the position where to delete: 2
The new list is :    8   0
```

Q9) find the second largest element in an array.

```
#include <stdio.h>

int main() {
  int array[10];
  int size, i, largest, second;
  printf("enter the size of array:");
  scanf("%d",&size);
  printf("the value stored in the array is:\n");
  for(i=0;i<size;i++){
     printf("a[%d]:",i);
  scanf("%d",&array[i]);
}
  if(array[0] > array[1]) {
    largest = array[0];
    second  = array[1];
  } else {
    largest = array[1];
    second  = array[0];
  }

  for(i=2;i<size;i++) {
    if(largest<array[i] ) {
      second = largest;
      largest = array[i];
    } else if( second < array[i] ) {
      second =  array[i];
    }
  }

  printf("Largest - %d \nSecond - %d \n", largest, second);
```

```c
  return 0;

}
```

OUTPUT

```
enter the size of array:3

the value stored in the array is:

a[0]5

a[1]7
```

a[2]9

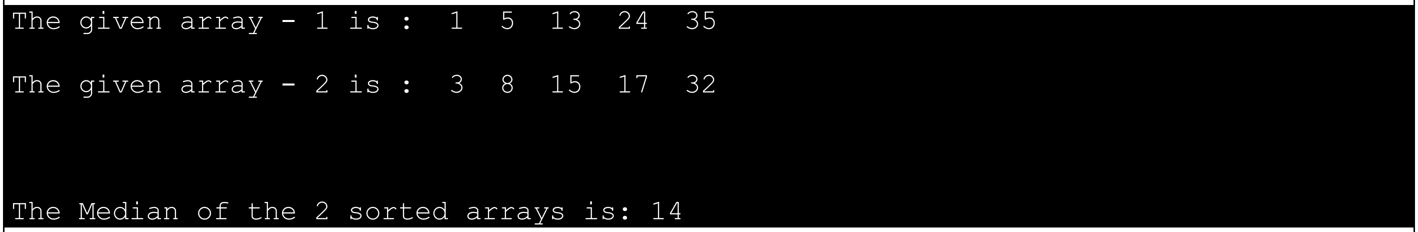
```
Largest - 9

Second - 7
```

Q10) . find the median of two sorted arrays of same size.

```c
#include <stdio.h>

int max(int a, int b)

{

  return ((a > b) ? a : b);

}

int min(int a, int b)

{

  return ((a < b) ? a : b);

}

int median(int arr[], int size)

{

  if (size % 2 == 0)

       return (arr[size/2] + arr[size/2-1])/2;

  else

       return arr[size/2];

}

int median2SortedArrays(int arr1[], int arr2[], int size)

{

  int med1;

  int med2;

  if(size <= 0) return -1;
  if(size == 1) return (arr1[0] + arr2[0])/2;
  if (size == 2) return (max(arr1[0], arr2[0]) + min(arr1[1], arr2[1])) / 2;
med1 = median(arr1, size);
  med2 = median(arr2, size);
if(med1 == med2) return med1;
if (med1 < med2)
  {
    return median2SortedArrays(arr1 + size/2, arr2, size - size/2);
  }
  else
  {
    return median2SortedArrays(arr2 + size/2, arr1, size - size/2);
  }
}
int main()
{
  int i,m,n;
  int arr1[] = {1, 5, 13, 24, 35};
  int arr2[] = {3, 8, 15, 17, 32};
  m = sizeof(arr1)
  n = sizeof(arr2)
         printf("The given array - 1 is :  ");
         for(i = 0; i < m; i++)
         {
         printf("%d  ", arr1[i]);
   }
         printf("\n");
         printf("The given array - 2 is :  ");
         for(i = 0; i < n; i++)
         {
         printf("%d  ", arr2[i]);
   }
```

```
        printf("\n");
   printf("\nThe Median of the 2 sorted arrays is: %d",median2SortedArrays(arr1, arr2, n));
   return 0;
}
```

OUTPUT

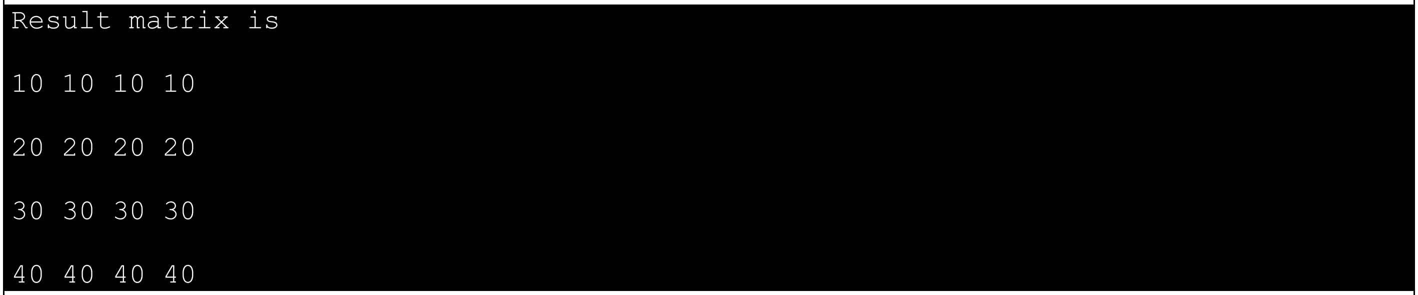


```
The given array - 1 is :  1  5  13  24  35

The given array - 2 is :  3  8  15  17  32



The Median of the 2 sorted arrays is: 14
```

11. multiplication of two square Matrices

```
#include <stdio.h>
#define N 4
void multiply(int mat1[][N], int mat2[][N], int res[][N])
{
    int i, j, k;
    for (i = 0; i < N; i++) {
        for (j = 0; j < N; j++) {
            res[i][j] = 0;
            for (k = 0; k < N; k++)
                res[i][j] += mat1[i][k] * mat2[k][j];
        }
    }
}

int main()
{
    int mat1[N][N] = { { 1, 1, 1, 1 },
                    { 2, 2, 2, 2 },
                    { 3, 3, 3, 3 },
                    { 4, 4, 4, 4 } };

    int mat2[N][N] = { { 1, 1, 1, 1 },
                    { 2, 2, 2, 2 },
                    { 3, 3, 3, 3 },
                    { 4, 4, 4, 4 } };

    int res[N][N]; // To store result
    int i, j;
    multiply(mat1, mat2, res);

    printf("Result matrix is \n");
    for (i = 0; i < N; i++) {
        for (j = 0; j < N; j++)
            printf("%d ", res[i][j]);
        printf("\n");
    }

    return 0;
}
```

OUTPUT

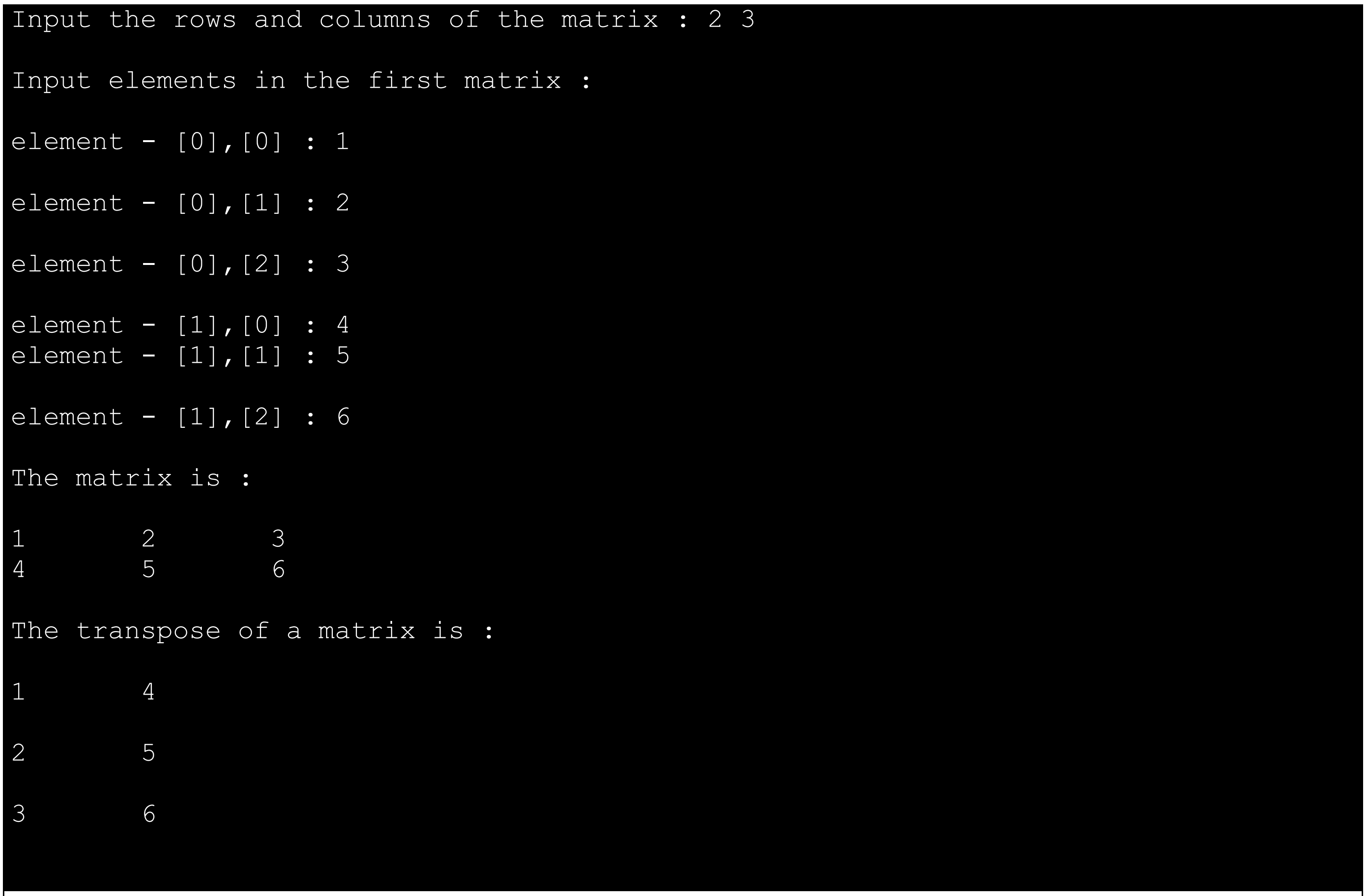


```
Result matrix is

10 10 10 10

20 20 20 20

30 30 30 30

40 40 40 40
```

12. find transpose of a given matrix.

```
#include <stdio.h>

void main()

  {
  int arr1[50][50],brr1[50][50],i,j,r,c;
      printf("\nInput the rows and columns of the matrix : ");
      scanf("%d %d",&r,&c);
      printf("Input elements in the first matrix :\n");
      for(i=0;i<r;i++)
       {
         for(j=0;j<c;j++)
         {
                  printf("element - [%d],[%d] : ",i,j);
                  scanf("%d",&arr1[i][j]);
         }
       }
 printf("\nThe matrix is :\n");
                    for(i=0;i<r;i++)
                    {
                    printf("\n");
                    for(j=0;j<c;j++)
          printf("%d\t",arr1[i][j]);
                    }
  for(i=0;i<r;i++)
    {
     for(j=0;j<c;j++)
         {
              brr1[j][i]=arr1[i][j];
         }
     }
printf("\n\nThe transpose of a matrix is : ");
     for(i=0;i<c;i++){
     printf("\n");
     for(j=0;j<r;j++){
        printf("%d\t",brr1[i][j]);
     }
  }
}
```

OUTPUT



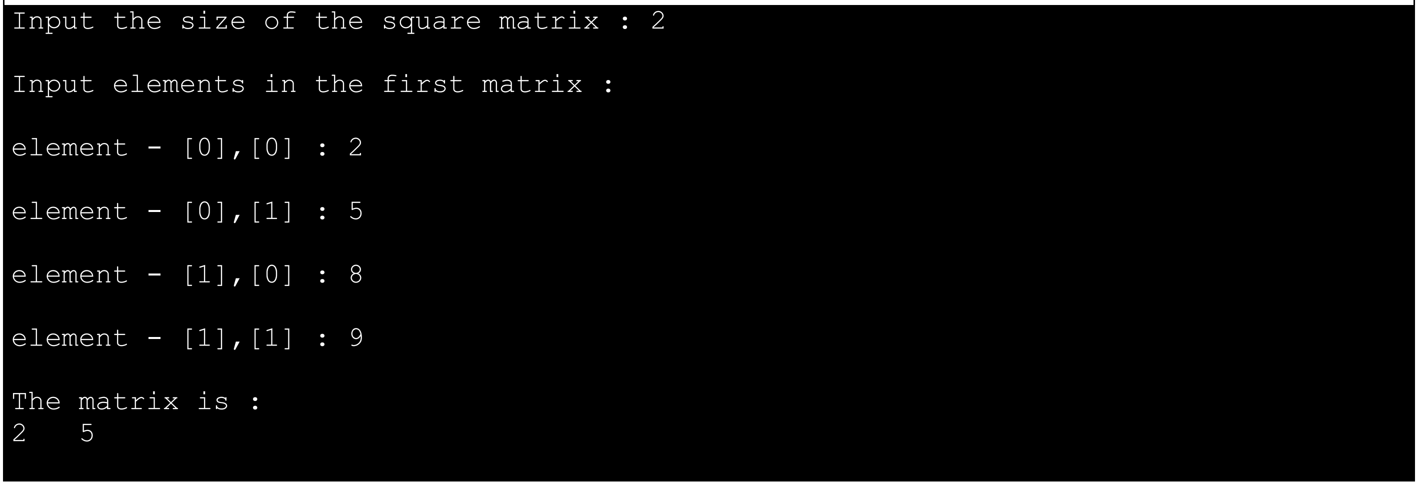
```
Input the rows and columns of the matrix : 2 3

Input elements in the first matrix :

element - [0],[0] : 1

element - [0],[1] : 2

element - [0],[2] : 3

element - [1],[0] : 4
element - [1],[1] : 5

element - [1],[2] : 6

The matrix is :

1       2       3
4       5       6

The transpose of a matrix is :

1       4

2       5

3       6
```

13. find the sum of left diagonals of a matrix.

```
#include <stdio.h>


void main()


  {

    int i,j,arr1[50][50],sum=0,n,m=0;


           printf("Input the size of the square matrix : ");

    scanf("%d", &n);

       m=n;

           printf("Input elements in the first matrix :\n");

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

      {

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

         {

                 printf("element - [%d],[%d] : ",i,j);

                 scanf("%d",&arr1[i][j]);
```

```
        }
      }
         printf("The matrix is :\n");
         for(i=0;i<n;i++)
         {
           for(j=0;j<n ;j++)
             printf("% 4d",arr1[i][j]);
            printf("\n");
         }
         for(i=0;i<n;i++)
         {
      m=m-1;
           for(j=0;j<n ;j++)
       {
         if (j==m)
           {
             sum= sum+arr1[i][j];
           }


       }
         }
    printf("Addition of the  left Diagonal elements is :%d\n",sum);
  }
```

OUTPUT



```
Input the size of the square matrix : 2

Input elements in the first matrix :

element - [0],[0] : 2

element - [0],[1] : 5

element - [1],[0] : 8

element - [1],[1] : 9

The matrix is :
2   5
```

```
8   9

Addition of the  left Diagonal elements is :13
```

14. check whether a given matrix is an identity matrix.

```
#include <stdio.h>

void main()

{

   int a[10][10];

   int i, j, row, column, count = 1;

   printf("Enter the order of the matrix A \n");

   scanf("%d %d", &row, &column);

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

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

   {

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

      {

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

      }

   }

   printf("MATRIX A is \n");

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

   {

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

      {

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

      }

      printf("\n");

   }

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

   {

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

      {

         if (a[i][j] != 1 && a[j][i] != 0)
```

```
        {
          count = 0;
          break;
        }
      }
   }
   if (count== 1 )
      printf("It is identity matrix \n");
   else
      printf("It is not a identity matrix \n");
}
```

OUTPUT

```
Enter the order of the matrix A

2

2

Enter the elements of matrix A

1

0

0
MATRIX A is

 1 0

 0 1

It is identity matrix
```

15. search an element in a row wise and column wise sorted matrix.

```
#include <stdio.h>
int searchElement(int arr2D[4][4], int n, int x)
{
  int i = 0, j = n-1;
  while ( i < n && j >= 0 )
  {
    if ( arr2D[i][j] == x )
    {
      printf("\nThe element Found at the position in the matrix is:  %d, %d", i, j);
```

```
         return 1;
      }
      if ( arr2D[i][j] < x )
        j--;
      else
        i++;
   }
   printf("\nThe given element not found in the 2D array.");
   return 0;
}

int main()
{
  int arr2D[4][4] = { {15, 23, 31, 39},
                    {18, 26, 36, 43},
                    {25, 28, 37, 48},
                    {30, 34, 39, 50},
                  };
int i,j,v;
v=51;
             printf("The given array in matrix form is :  \n");
             for(i = 0; i < 4; i++)
             {
             for (j=0;j<4;j++)
             {
             printf("%d  ", arr2D[i][j]);
    }
             printf("\n");
             }
  printf("The given value for searching is: %d",v);
  searchElement(arr2D, 4, v);
  return 0;
```

```
}
```

OUTPUT

```
The given array in matrix form is :

15  23  31  39

18  26  36  43

25  28  37  48

30  34  39  50

The given value for searching is: 51

The given element not found in the 2D array.
```