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

```
#include <stdio.h>
int main()
{
	int arr[10];
	int size, i;
	printf("Enter size of the array: ");
	scanf("%d", &size);

	printf("Enter elements in array: ");
	for(i=0; i<size; i++)
	{
		scanf("%d", &arr[i]);
	}
	printf("\nArray in reverse order: ");
	for(i = size-1; i>=0; i--)
	{
		printf("%d\t", arr[i]);
	}

	return 0;
}
```

OUTPUT:

```
Enter size of the array: 5

Enter elements in array: 2 3 4 5 6


Array in reverse order: 6	5	4	3	2
```

2. find the sum of all elements of the array.

```
#include <stdio.h>

int main()
{
        int arr[10];
       int i, n, sum=0;
         printf("Enter size of the array: ");
        scanf("%d", &n);
       printf("Enter %d elements in the array: ", n);
        for(i=0; i<n; i++)
        {
                scanf("%d", &arr[i]);
        sum += arr[i];
        }

        printf("Sum of all elements of array = %d", sum);

        return 0;
}
```

OUTPUT:

```
Enter size of the array: 5

Enter 5 elements in the array: 8 9 10 11 12

Sum of all elements of array = 50
```

3. copy the elements of one array into another array.

```
#include<stdio.h>
      int main() {
            int arr1[20], arr2[20];
            int i, j, n1;
            printf("\nEnter size of array :");
            scanf("%d", &n1);
            printf("Enter the 1st Array elements one by one \n");
            for (i = 1; i<=n1; i++)
            scanf("%d", &arr1[i]);
            for (i = 1; i<=n1; i++)
            arr2[i] = arr1[i];
            printf("The Coppied Array elements in the 2nd Array : \n");
            for (i = 1; i<=n1; i++)
            printf(" %d", arr2[i]);
    return 0;
    }
```

OUTPUT:

```
Enter size of array :5

Enter the 1st Array elements

4 5 6 7 8
The Coppied Array elements in the 2nd Array :

 4 5 6 7 8
```

4. count a total number of duplicate elements in an array.

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

    int arr[10], i, j, Size, Count = 0;

    printf("\n Enter Number of elements in an array    :      ");
    scanf("%d", &Size);

    printf("\n Enter %d elements of an Array    :    ", Size);
    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("\n Total Number of Duplicate Elements in this Array    =    %d ",
Count);
return 0;
}
```

OUTPUT:

```
Enter Number of elements in an array  :  6


 Enter 6 elements of an Array  :  10 20 30 10 15 30


 Total Number of Duplicate Elements in this Array  =  2
```

5. find the maximum and minimum element in an array.

```
#include <stdio.h>
int main(){
  int a[1000],i,n,min,max;

        printf("Enter size of the array : ");
        scanf("%d",&n);

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

        min=max=a[0];
        for(i=1; i<n; i++)
        {
                  if(min>a[i])
                min=a[i];
                  if(max<a[i])
                    max=a[i];
        }
          printf("minimum of array is : %d",min);
                    printf("\nmaximum of array is : %d",max);
     return 0;
}
```

OUTPUT:

```
Enter size of the array : 5

Enter elements in array : 10 11 12 13 14

minimum of array is : 10

maximum of array is : 14
```

6. separate odd and even integers in separate arrays.

```
#include<stdio.h>

int main()
{
  int i,j,k;
       int num[10] = {1,2,3,4,5,6,7,8,9,10};
        int odd[10];
        int even[10];
        j = 0;
       k = 0;
       for(i = 0; i<10 ; i++){
                if(num[i]%2 == 0){
                        even[j] = num[i];
                        j++;
                }else{
                        odd[k] = num[i];
                        k++;
                }
        }
        printf("even numbers : ");
        for(i = 0;i<j; i++){
                printf("%d ",even[i]);
        }

        printf("\nodd numbers : ");
        for(i = 0;i<k; i++){
                printf("%d ",odd[i]);
        }
       printf("\n");
       return 0;
}
```

OUTPUT:

```
even numbers  : 2 4 6 8 10

odd numbers  : 1 3 5 7 9
```

7. insert New value in the array.

```
#include <stdio.h>
int main()
{
    int array[100], position, c, n, value;
      printf("Enter number of elements in array:");
      scanf("%d", &n);

      printf("Enter %d elements:", n);

      for (c = 0; c < n; c++)
            scanf("%d", &array[c]);

      printf("Enter the location where you wish to insert an element:");
      scanf("%d", &position);

      printf("Enter the value to insert:");
      scanf("%d", &value);

      for (c = n - 1; c >= position - 1; c--)
      array[c+1] = array[c];
     array[position-1] = value;
      printf("Resultant array is:");
          for (c = 0; c <= n; c++)
            printf("%d\t", array[c]);

      return 0;
}
```

OUTPUT:

```
Enter number of elements in array:5

Enter 5 elements:1 2 3 4 5

Enter the location where you wish to insert an element:2

Enter the value to insert:10

Resultant array is:1    10      2       3       4       5
```

8. delete an element at desired position from an array.

```
#include <stdio.h>
int main()
{
      int array[100], z, c, n;
        printf("Enter number of elements in array:");
      scanf("%d", &n);
      printf("Enter %d elements\n", n);
      for (c = 0; c < n; c++)
            scanf("%d", &array[c]);
      printf("Enter the location where you wish to delete element:");
      scanf("%d", &z);
    if (z >= n+1)
            printf("Deletion not possible.\n");
      else
      {
            for (c = z - 1; c < n - 1; c++)
                  array[c] = array[c+1];
            printf("Resultant array:\n");
            for (c = 0; c < n - 1; c++)
                  printf("%d\n", array[c]);
      }
      return 0;
}
```

```
Enter number of elements in array:5

Enter 5 elements

1 2 3 4 5
Enter the location where you wish to delete element:3

Resultant array:
 1
 2
 4
 5
```

9. find the second largest element in an array.

```
#include <stdio.h>
int main()
{
        int array[10] = {50, 15, 80, 100, 70, 30, 75, 150, 170, 40};
    int a, largest, second_largest;
    if(array[0] > array[1]) {
        largest = array[0];
        second_largest    = array[1];
    } else {
        largest = array[1];
        second_largest = array[0];
    }
    for(a = 2; a < 10; a++) {
        if( largest < array[a] ) {
            second_largest = largest;
              largest = array[a];
        } else if( second_largest < array[a] ) {
              second_largest=    array[a];
        }
    }
    printf("second_largest: %d \n",second_largest);
    return 0;
}
```

OUTPUT:

```
second_largest: 150
```

10. find the median of two sorted arrays of same size.

```
#include <stdio.h>
int getMedian(int ar1[], int ar2[], int n)
{
        int i = 0,j = 0;
        int count;
        int m1 = -1, m2 = -1;
          for (count = 0; count <= n; count++) {
                    if (i == n){
                      m1 = m2;
                      m2 = ar2[0];
                      break;
                }
                else if (j == n) {
                      m1 = m2;
                      m2 = ar1[0];
                      break;
                }
                if (ar1[i] <= ar2[j])
                {
                      m1 = m2;
                      m2 = ar1[i];
                      i++;
                }
                else{
                      m1 = m2;
                      m2 = ar2[j];
                      j++;
                } }
            return (m1 + m2)/2;
}
  int main(){
        int ar1[] = {1, 12, 15, 26, 38};
        int ar2[] = {2, 13, 17, 30, 45};
        int n1 = sizeof(ar1)/sizeof(ar1[0]);
        int n2 = sizeof(ar2)/sizeof(ar2[0]);
        if (n1 == n2)
              printf("Median is %d", getMedian(ar1, ar2, n1));
        else
              printf("Doesn't work for arrays of unequal size");
          return 0;
}
```

OUTPUT:

```
Median is 16
```

11. multiplication of two square Matrices

```
#include <stdio.h>
int main(){
int a[10][10],b[10][10],mul[10][10],r,c,i,j,k;
printf("enter the number of row=");
scanf("%d",&r);
printf("enter the number of column=");
scanf("%d",&c);
printf("enter the first matrix element=\n");
for(i=0;i<r;i++){
for(j=0;j<c;j++){
scanf("%d",&a[i][j]);
}}
printf("enter the second matrix element=\n");
for(i=0;i<r;i++){
for(j=0;j<c;j++){
scanf("%d",&b[i][j]);
}}
printf("multiply  of the matrix=\n");
for(i=0;i<r;i++){
for(j=0;j<c;j++){
mul[i][j]=0;
for(k=0;k<c;k++){
mul[i][j]+=a[i][k]*b[k][j];
}}}
for(i=0;i<r;i++){
for(j=0;j<c;j++){
printf("%d\t",mul[i][j]);
}
printf("\n");
}
return 0;
}
```

OUTPUT:

```
enter the number of row=2

enter the number of column=2

enter the first matrix element=

1 2
3 4
enter the second matrix element=
5 6
7 8
multiply of the matrix=

19      22
43      50
```

12. find transpose of a given matrix.

```
#include <stdio.h>
int main(){
    int a[10][10], transpose[10][10], r, c, i, j;
        printf("Enter rows and columns: ");
        scanf("%d %d", &r, &c);
        printf("\nEnter matrix elements:\n");
        for (i = 0; i < r; ++i)
                for (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 (i = 0; i < r; ++i)
                for (j = 0; j < c; ++j) {
                        printf("%d      ", a[i][j]);
                        if (j == c - 1)
                                printf("\n");
                }
        for (i = 0; i < r; ++i)
                for (j = 0; j < c; ++j) {
                        transpose[j][i] = a[i][j];
                }
        printf("\nTranspose of the matrix:\n");
        for (i = 0; i < c; ++i)
                for (j = 0; j < r; ++j) {
                        printf("%d      ", transpose[i][j]);
    if (j == r - 1)
                                printf("\n");
                }
        return 0;
}
```

OUTPUT:

```
Enter rows and columns: 2 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

Entered matrix:

1  2  3
4  5  6
```

13. find the sum of left diagonals of a matrix

```
#include <stdio.h>
int 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);
        return 0;
}
```

OUTPUT:

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

Input elements in the first matrix :

element - [0],[0] : 1

element - [0],[1] : 2

element - [1],[0] : 3

element - [1],[1] : 4

The matrix is :
 1   2
 3   4
Addition of the  left Diagonal elements is :5
```

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

```
#include <stdio.h>
int main(){
      int arr1[10][10];
      int r1,c1;
      int i, j, yn =1;
      printf("Input number of Rows for the matrix :");
      scanf("%d", &r1);
      printf("Input number of Columns for the matrix :");
      scanf("%d",&c1);
       printf("Input elements in the first matrix :\n");
             for(i=0;i<r1;i++)
               {
                      for(j=0;j<c1;j++)
   {
                          printf("element - [%d],[%d] : ",i,j);
                          scanf("%d",&arr1[i][j]);
                      }
               }
       printf("The matrix is :\n");
       for(i=0;i<r1;i++)
       {
           for(j=0;j<c1 ;j++)
              printf("% 4d",arr1[i][j]);
            printf("\n");
       }
       for(i=0; i<r1; i++)
       {
         for(j=0; j<c1; j++)
         {
 if(arr1[i][j] != 1 && arr1[j][i] !=0)
       {
           yn = 0;
           break;
       }
     }
     }
     if(yn == 1 )
printf(" The matrix is an identity matrix.\n\n");
      else
     printf(" The matrix is not an identity matrix.\n\n");
     return 0;
}
```

OUTPUT:

```
Input number of Rows for the matrix :2

Input number of Columns for the matrix :2

Input elements in the first matrix :

element - [0],[0] : 1

element - [0],[1] : 2

element - [1],[0] : 3

element - [1],[1] : 4
The matrix is :
  1   2
  3   4
 The matrix is not an identity matrix.
```

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

```
#include <stdio.h>
int search(int mat[4][4], int n, int x)
{
int i = 0, j = n-1;
while ( i < n && j >= 0 )
{
      if ( mat[i][j] == x )
      {
            printf("The given value for searching is    %d, %d", i, j);
            return 1;
      }
      if ( mat[i][j] > x )
            j--;
      else
            i++;
}
printf("n Element not found");
return 0;
}
int main()
{
int mat[4][4] = { {10, 20, 30, 40},
                  {15, 25, 35, 45},
                  {27, 29, 37, 48},
                  {32, 33, 39, 50},
                     };
search(mat, 4, 29);
return 0;
}
```

OUTPUT:

```
The given value for searching is   2, 1
```