

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 Copied 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 Copied 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("\nEnter matrix: \n");
    for (i = 0; i < r; ++i)
        for (j = 0; j < c; ++j) {
            printf("%d\t", 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\t", 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