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

```
2.  #include <stdio.h>
3.
4.  int main()
5.  {
6.  int i,arr[10];
7.  int num;
8.
9.  printf("enter the size of array:");
10. scanf("%d",&num);
11.
12. printf("enter elements in array:");
13. for(i=0;i<num;i++)
14. {
15.     scanf("%d",&arr[i]);
16. }
17.     printf("the reverse array is:");
18.     for(i=num-1;i>=0;i--)
19.     {
20.         printf("%d\n",arr[i]);
21.     }
22.     return 0;
23. }
```

Output:-

enter the size of array:3

enter elements in array:1

2

3

the reverse array is:3

2

1

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

```c
#include <stdio.h>

int main()
{
    int arr[100];
    int i, n, sum=0;

        printf("enter the number of elements for array:");
        scanf("%d",&n);

        for(i=0;i<n;i++)
         {
            scanf("%d",&arr[i]);
         }

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

    printf("Sum of all numbers in array is: %d\n", sum);

    return 0;
}
```

Output:-

enter the number of elements for array:5

1

2

3

4

5

Sum of all numbers in array is: 15

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

```c
#include <stdio.h>

int main()
{
    int arr1[100], arr2[100];
    int i, n;

        printf("enter the number of elements for an array :");
        scanf("%d",&n);

        printf("enter the numbers:\n",n);
        for(i=0;i<n;i++)
         {
            scanf("%d",&arr1[i]);
         }
    for(i=0;i<n;i++)
    {
        arr2[i] = arr1[i];
    }
    printf("the numbers of the first array are:\n");
    for(i=0;i<n;i++)
    {
        printf("%d\n", arr1[i]);
    }
    printf("the numbers of the second array are:\n");
    for(i=0;i<n;i++)
    {
        printf("%d\n", arr2[i]);
    }


        return 0;
}
```

Output:-

enter the number of elements for an array :3

enter the numbers:

1

5

6

the numbers of the first array are:

1

5

6

the numbers of the second array are:

1

5

6

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

```c
#include <stdio.h>
int main()
{
    int arr[100];
    int i, j, n, Count = 0;

    printf("enter the number of elements for an array:\n");
    scanf("%d", &n);

    printf("enter the numbers for an array:\n",n);
    for (i=0;i<n;i++)
    {
        scanf("%d", &arr[i]);
    }

    for ( i=0;i<n;i++)
    {
        for(j=i+1;j<n;j++)
        {
            if(arr[i] == arr[j])
            {
                Count++;
                break;
            }
        }
    }

    printf("duplicate elements in an array=%d\n",Count);

    return 0;
}
```

Output:-

enter the number of elements for an array:

10

enter the numbers for an array:

2

5

6

9

6

7

8

4

4

2

duplicate elements in an array=3

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

```c
#include <stdio.h>
int main()
{
    int arr[100];
    int i, max, min, size;
    printf("enter the size of array: ");
    scanf("%d", &size);

    printf("enter elements in the array:\n ");
    for(i=0;i<size;i++)
    {
        scanf("%d", &arr[i]);
    }
    max = arr[0];
    min = arr[0];

    for(i=1;i<size;i++)
    {
        if(arr[i] > max)
        {
            max = arr[i];
        }

        if(arr[i] < min)
        {
            min = arr[i];
        }
    }

    printf("the maximum element of an array is %d\n", max);
    printf("the minimun element of an array is %d", min);

    return 0;
}
```

Output:-

enter the size of array: 5

enter elements in the array:

 1

2

3

5

2

the maximum element of an array is 5

the minimun element of an array is 1

6. separate odd and even integers in separate arrays.

```c
#include <stdio.h>
int main()
{
    int arr[100];
    int i,num;
    printf("enter the size of an array:\n");
    scanf("%d",&num);

    printf("enter the elements of an array:\n");
    for(i=0;i<num;i++)
    {
        scanf("%d",&arr[i]);
    }

    printf("the even numbers of the array are:\n");
     for(i=0;i<num;i++)
     {
        if(arr[i]%2==0)
        {
            printf("%d\n",arr[i]);
        }
     }

    printf("the Odd numbers of the array are:\n");
     for(i=0;i<=num;i++)
     {
        if (arr[i]%2==1)
        {
            printf("%d\n",arr[i]);
        }
     }
    return 0;
}
```

Output:-

enter the size of an array:

6

enter the elements of an array:

2

3

6

1

7

5

the even numbers of the array are:

2

6

the Odd numbers of the array are:

3

1

7

5

5

7. insert New value in the array.

```c
#include <stdio.h>
int main()
{
    int arr[100];
    int i, size, num, pos;

    printf("enter the size of an array: ");
    scanf("%d", &size);

    printf("enter elements of an array:\n ");
    for(i=0; i<size; i++)
    {
        scanf("%d", &arr[i]);
    }

    printf("enter element to insert: ");
    scanf("%d", &num);
    printf("enter the position of the element: ");
    scanf("%d", &pos);

    if(pos > size+1 || pos <= 0)
    {
        printf("wrong position", size);
    }
    else
    {
        for(i=size; i>=pos; i--)
        {
            arr[i] = arr[i-1];
        }

        arr[pos-1] = num;
        size++;
        printf("the array elements after insertion are: ");
        for(i=0; i<size; i++)
        {
            printf("%d", arr[i]);
        }
    }

    return 0;
}
```

Output:-

enter the size of an array: 7

enter elements of an array:

 5

6

4

3

2

1

9

enter element to insert: 55

enter the position of the element: 4

the array elements after insertion are: 564553219

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

```c
#include <stdio.h>
int main()
{
    int arr[100];
    int i, size, pos;

    printf("enter the size of an array: ");
    scanf("%d", &size);

    printf("enter the elements of an array:\n ");
    for(i=0;i<size;i++)
    {
        scanf("%d", &arr[i]);
    }


    printf("enter the element to be deleted: ");
    scanf("%d", &pos);

    if(pos < 0 || pos > size)
    {
        printf("wrong position", size);
    }
    else
    {
        for(i=pos-1;i<size-1;i++)
        {
            arr[i] = arr[i + 1];
        }
        size--;

        printf("the array elements after delete are: ");
        for(i=0; i<size; i++)
        {
            printf("%d", arr[i]);
        }
    }

    return 0;
}
```

Output:-

enter the size of an array: 8

enter the elements of an array:

 1

2

3

4

5

6

7

8

enter the element to be deleted: 5

the array elements after delete are: 1234678

9. find the second largest element in an array

```c
#include <stdio.h>
int main()
{
    int arr[100];
    int size, i,max1, max2;

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

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

    max1=max2;
     for(i=0; i<size; i++)
    {
        if(arr[i] > max1)
        {
          max2 = max1;
            max1 = arr[i];
        }
        else if(arr[i] > max2 && arr[i] < max1)
        {
            max2 = arr[i];
        }
    }

    printf("First largest = %d\n", max1);
    printf("Second largest = %d", max2);

    return 0;
}
```

Output:-

Enter size of the array: 8

Enter elements in the array:

 1

2

3

4

5

6

7

8

First largest = 8

Second largest = 7

11. multiplication of two square Matrices

```c
#include<stdio.h>
int main()
{
int a[10][10],b[10][10],c[10][10];
int row,column,i,j,k;
printf("enter the number of row:");
scanf("%d",&row);

printf("enter the number of column");
scanf("%d",&column);
printf("enter the first matrix element=\n");
for(i=0;i<row;i++)
{
for(j=0;j<column;j++)
{
scanf("%d",&a[i][j]);
}
}
printf("enter the second matrix element:\n");
for(i=0;i<row;i++)
{
for(j=0;j<column;j++)
{
scanf("%d",&b[i][j]);
}
}
printf("multiplication of the two matrixes are:\n");
for(i=0;i<row;i++)
{
for(j=0;j<column;j++)
{
c[i][j]=0;
for(k=0;k<column;k++)
{
c[i][j]+=a[i][k]*b[k][j];
}
}
}
for(i=0;i<row;i++)
{
for(j=0;j<column;j++)
{
printf("%d\t",c[i][j]);
}
}
return 0;
}
```

Output:-

enter the number of row:3

enter the number of column3

enter the first matrix element=

1

2

3

4

5

6

7

8

9

enter the second matrix element:

9

8

7

6

5

4

3

2

1

multiplication of the two matrixes are:

30   24   18   84   69   54   138   114   90

12. find transpose of a given matrix.

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

Output:-

Enter rows and columns:

 3

3

enter the elements of matrix:

enter element arr11: 1

enter element arr12: 2

enter element arr13: 3

enter element arr21: 4

enter element arr22: 5

enter element arr23: 6

enter element arr31: 7

enter element arr32: 8

enter element arr33: 9

1 2 3

4 5 6

7 8 9

 the transpose of the matrix is:

1 4 7

2 5 8

3 6 9

13. find the sum of left diagonals of a matrix

```c
#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:-

nput 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] : 42

The matrix is :

  1 2

  3 42

Addition of the left Diagonal elements is :5

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

```c
#include<stdio.h>
int main()
{
    int i, j, rows, columns, a[10][10], Flag = 1;

    printf("\n enter the Number of rows and columns  :  ");
    scanf("%d %d", &i, &j);

    printf("\n enter the Matrix Elements \n");
    for(rows = 0; rows < i; rows++)
    {
        for(columns = 0; columns < j; columns++)
        {
            scanf("%d", &a[rows][columns]);
        }
    }

    for(rows = 0; rows < i; rows++)
    {
        for(columns = 0; columns < j; columns++)
        {
            if(a[rows][columns] != 1 && a[columns][rows] != 0)
            {
                Flag = 0;
                break;
            }
        }
    }
    if(Flag == 1)
    {
        printf("\n the matrix that you entered is an Identity Matrix ");
    }
    else
    {
        printf("\n the matrix that you entered is Not an Identity Matrix ");
    }

    return 0;
}
```

Output:-

enter the Number of rows and columns : 2

2

 enter the Matrix Elements

1

2

3

4

 the matrix that you entered is Not an Identity Matrix

enter the Number of rows and columns : 2

2

 enter the Matrix Elements

1

0

0

1

 the matrix that you entered is an Identity Matrix