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

Program:-

```
#include <stdio.h>

int main() {
 int a[10],i,s;
    printf("Enter size of array: ");
    scanf("%d",&s);
    printf("enter elements: \n");
    for(i=1;i<=s;i++)
    {
        scanf("%d",&a[i]);
            }
            printf("elements are : \n");
             for(i=1;i<=s;i++)
             {
            printf("%d\t",a[i]);
             }
             printf("\nreverse of the avove no is: \n");
             for(i=s;i>=1;--i)
             {
                 printf("%d\t",a[i]);
             }

    return 0;
}
```

Output:-

```
Enter size of array: 3
enter elements:
1
2
3
elements are :
1       2       3
reverse of the avove no is:
3       2       1
```

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

Program:-

```
        #include <stdio.h>
int main() {
 int a[10],i,s,sum=0;
     printf("Enter size of array: ");
     scanf("%d",&s);
     printf("enter elements: \n");
     for(i=1;i<=s;i++)
     {
          scanf("%d",&a[i]);
          sum=sum+i;
               }
               printf("elements are : \n");
                for(i=1;i<=s;i++)
                {
               printf("%d\t",a[i]);
                }
                printf("\nsum of the above elements are: %d",sum);
                return 0;
}
```

Output:-

```
Enter size of array: 4
enter elements:
1
5
4
10
elements are :
1       5       4       10
sum of the above elements are: 10
```

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

Program:-

```
#include <stdio.h>
int main() {
  int a[15],b[15],i,n;
      printf("Enter elements size : ");
      scanf("%d",&n);
      printf("enter elements  : ");
      for(i=0;i<n;i++)
      {
           scanf("%d",&a[i]);
      }
      printf("after coping elements are :\n");
      for(i=0;i<n;i++)
      {
           b[i]=a[i];
           printf("%d\t",b[i]);
      }

    return 0;
}
```

Output:-

```
Enter elements size : 4
enter elements: 1
2
3
4
after coping elements are :
1       2       3       4
```

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

Program:-

```
#include <stdio.h>
int main() {
  int a[15],b[15],i,j,n,c=0;
    printf("Enter elements size : ");
    scanf("%d",&n);
    printf("enter elements  : ");
    for(i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
          }
    for(i=0;i<n;i++)
    {
    for(j=i+1;j<n;j++)
        {
        if(a[i]==a[j])
        {
        c++;
        break;
        }
    }
        }
         printf("total no of duplicate elements are : %d ",c);
        return 0;
}
```

Output:-

```
Enter elements size : 5
enter elements  : 4
5
6
4
4
total no of duplicate elements are : 2
```

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

Program:-

```
#include<stdio.h>
int main()
{
    int a[30],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 : 6
7
8
9
7
minimum of array is : 6
maximum of array is : 9
```

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6. separate odd and even integers in separate arrays.

Program:-

```
#include<stdio.h>
int main()
{
    int a[30],i,n,e[30],o[30];
      printf("Enter size of the array : ");
    scanf("%d",&n);

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

    }
    printf("even elements are: \n");
     for(i=0; i<n; i++)
    {
          if(a[i]%2==0)
             e[i]=a[i];
                    printf("%d \t",e[i]);
    }
    printf("\n odd elements are: \n");
                     for(i=0; i<n; i++)
    {
                    if(a[i]%2!=0)
                    o[i]=a[i];
                    printf("%d\t",o[i]);
                  }
     return 0;
}
```

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Output:-

```
Enter size of the array : 6
Enter elements in array : 1
2
3
4
5
6
even elements are:
0       2       0       4       0       6
 odd elements are:
1       0       3       0       5       0
```

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7. insert New value in the array.

Program:-

```
#include <stdio.h>
int main()
{
    int a[30], p, i, n,v;

    printf("Enter number of elements in array : ");
    scanf("%d", &n);

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

    for (i= 0; i< n; i++)
       scanf("%d", &a[i]);
printf("Your entered elements are : ");
     for (i= 0; i< n; i++)
     {
       printf("%d\t",a[i]);
     }

    printf("\nEnter the position where to add a element\n");
    scanf("%d", &p);
    printf("Enter the value of element : \n");
    scanf("%d", &v);

    if (p> n)
       printf("\nEntered wrong postion of array.\n");
    else
    {
       for (i = p ; i>=n ; i--)

          a[i] = a[i-1];
          a[i-1]=v;

       printf("\nafter delete an element the array is :\n");

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

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

    return 0;
}
```

Output:-

```
Enter number of elements in array : 3
Enter 3 elements
1
5
3
Your entered elements are : 1   5     3
Enter the position where to add a element
2
Enter the value of element :
2
after delete an element the array is :
1     2     3
```

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

Program:-

```
#include <stdio.h>
int main()
{
    int a[30], p, i, n;

    printf("Enter number of elements in array : ");
    scanf("%d", &n);

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

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

    printf("\nEnter the position to delete a element\n");
    scanf("%d", &p);

    if (p>= n+1)
       printf("\nEntered wrong postion of array.\n");
    else
    {
       for (i = p - 1; i < n-1 ; i++)
          a[i] = a[i+1];

       printf("\nafter delete an element the array is :\n");

       for (i = 0; i < n-1; i++)
          printf("%d\t", a[i]);
    }

    return 0;
```

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```
}
```

Output:-

```
Enter number of elements in array : 5
Enter 5 elements
1
10
11
20
15
Your entered elements are : 1   10    11    20    15
Enter the position to delete a element :
2
after delete an element the array is :
1     11     20    15
```

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9. find the second largest element in an array.

Program:-

```
#include <stdio.h>
int main()
{
    int a[10], p, i;
    int n,l,sl,j;

    printf("Enter number of elements in array : ");
    scanf("%d", &n);

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

    for (i= 0; i< n; i++)
        scanf("%d", &a[i]);
        l=a[0];
        sl=a[1];
printf("Your entered elements are : \n");
     for (i= 0; i< n; i++)
     {
        printf("%d\t",a[i]);
     }
        for (i= 0; i< n; i++)
     {
            if (a[i]>l)
            {
        sl=l;
 l=a[i];
            }
          else if (a[i]>sl&&a[i]!=l)
          {
     sl=a[i];
            }}
     printf("sl element is : %d",sl);
```

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```
  return 0;
}
```

Output:-

```
Enter number of elements in array : 3
Enter 3 elements
5
7
9
Your entered elements are :
5     7     9     sl element is : 7
```

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

Program:-

```
#include <stdio.h>
int getMedian(int ar1[], int ar2[], int n)
{
    int i = 0;
    int 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;
```

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```
            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");
    getchar();
    return 0;
}
```

Output:-

```
Median is 16
```

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11. multiplication of two square Matrices.

Program:-

```
#include <stdio.h>
int main() {
    int a[10][10],b[10][10],mp[10][10];
    int i,j,r1,c1,r2,c2,m,sum=0;
    printf("Enter size of 1st array row: ");
    scanf("%d",&r1);
     printf("Enter size of 1st array column: ");
    scanf("%d",&c1);
     printf("Enter size of 2nd array row: ");
    scanf("%d",&r2);
     printf("Enter size of 2nd array column: ");
    scanf("%d",&c2);
    if(c1!=r2)
    printf("array is not same size so multiplication not possible.");
    else
    printf("Enter elements of 1st matrix: \n");
    for(i=0;i<r1;i++)
    {
        for(j=0;j<c1;j++)
        {
            printf("value of [%d][%d]= ",i,j);
            scanf("%d",&a[i][j]);
        }
    }

     printf("Enter elements of 2nd matrix: \n");
    for(i=0;i<r2;i++)
    {
        for(j=0;j<c2;j++)
        {
            printf("value of [%d][%d]= ",i,j);
            scanf("%d",&b[i][j]);
        }
    }
    //for multiplication
        for(i=0;i<r1;i++)
    {
```

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```
            for(j=0;j<c2;j++)
            {
          for(m=0;m<r1;m++)
            {
          sum=sum+a[i][m]*b[m][j];
                  }
        mp[i][j]=sum;
        sum=0;
      }
      }
      printf("after multiplication: \n")  ;
                for(i=0;i<r2;i++)
      {
            for(j=0;j<c2;j++)
            {
                  printf("%d\t",mp[i][j]);
            }
            printf("\n");
      }
                  return 0;
}
```

Output:-

```
Enter size of 1st array row: 2
Enter size of 1st array column: 2
Enter size of 2nd array row: 2
Enter size of 2nd array column: 2
Enter elements of 1st matrix:
value of [0][0]= 1
value of [0][1]= 2
value of [1][0]= 3
value of [1][1]= 4
Enter elements of 2nd matrix:
value of [0][0]= 5
value of [0][1]= 6
value of [1][0]= 7
value of [1][1]= 8
after multiplication:
19      22
43      50
```

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12. find transpose of a given matrix.

Program:-

```
#include <stdio.h>
int main()
{
     int a[10][10],t[10][10];
     int i,j,r,c;

     printf("Enter size of  row: ");
     scanf("%d",&r);
      printf("Enter size of column: ");
     scanf("%d",&c);

     printf("Enter the elements of array: \n");
     for(i=0;i<r;i++)
     {
          for(j=0;j<c;j++)
          {
scanf("%d",&a[i][j]);
}
}
printf("your entered matrix is : \n");
for(i=0;i<r;i++)
     {
          for(j=0;j<c;j++)
          {
printf("%d\t",a[i][j]);
}
printf("\n");
}

for(i=0;i<r;i++)
     {
          for(j=0;j<c;j++)
          {
t[j][i]=a[i][j];
}
```

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```
}
printf("transforce of matrix: \n");
for(i=0;i<c;i++)
    {
        for(j=0;j<r;j++)
        {
printf("%d\t",t[i][j]);
}
printf("\n");
}
return 0;
}
```

Output:-

```
Enter size of  row: 2
Enter size of column: 3
Enter the elements of array:
1
2
3
4
5
6
your entered matrix is :
1       2       3
4       5       6
transforce of matrix:
1       4
2       5
3       6
```

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

Program:-

```
#include <stdio.h>
void main()
{
int i,j,a[10][10],sum=0,n,m=0;
printf("enter size of the  matrix : ");
scanf("%d", &n);
m=n;
printf("enter elements of matrix :\n");
for(i=0;i<n;i++)
{
for(j=0;j<n;j++)
{
printf("value of [%d][%d] : ",i,j);
scanf("%d",&a[i][j]);
}
}
printf("entered matrix is :\n");
for(i=0;i<n;i++)
{
for(j=0;j<n ;j++)
{
     printf("%d\t",a[i][j]);
}
printf("\n");
}

for(i=0;i<n;i++)
{
m=m-1;
for(j=0;j<n ;j++)
{
if (j==m)
{
sum= sum+a[i][j];
```

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

Output:-

```
enter size of the  matrix : 2
enter elements of matrix :
value of [0][0] : 2
value of [0][1] : 2
value of [1][0] : 2
value of [1][1] : 2
entered matrix is :
2      2
2      2
Adding the left Diagonal elements is :4
```

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

Program:-

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

     printf("Enter size of  row: ");
     scanf("%d",&r);
      printf("Enter size of column: ");
     scanf("%d",&c);

     printf("Enter the elements of array: \n");
     for(i=0;i<r;i++)
     {
```

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```
            for(j=0;j<c;j++)
            {
scanf("%d",&a[i][j]);
}
}
printf("your entered matrix is : \n");
for(i=0;i<r;i++)
    {
            for(j=0;j<c;j++)
            {
printf("%d\t",a[i][j]);
}
printf("\n");
}
for(i=0;i<r;i++)
{
for (j = 0; j < c; j++)
{
if (a[i][j] != 1 && a[j][i] != 0)
{
flag = 0;
break;
}
}
}
if (flag==1)
printf(" your matrix is a identity matrix. \n");
else
{
printf("your matrix is not a identity matrix. \n");
}

return 0;
}
```

Output:-

```
Enter size of  row: 2
Enter size of column: 2
Enter the elements of array:
1
```

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```
0
0
1
your entered matrix is :
1       0
0       1
 your matrix is a identity matrix.
```

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

Program:-

```
#include <stdio.h>
int main()
{
     int a[10][10];
     int i,j,r,c,f;

     printf("Enter size of  row: ");
     scanf("%d",&r);
      printf("Enter size of column: ");
     scanf("%d",&c);

     printf("Enter the elements of array: \n");
     for(i=0;i<r;i++)
     {
          for(j=0;j<c;j++)
          {
scanf("%d",&a[i][j]);
}
}
printf("your entered matrix is : \n");
for(i=0;i<r;i++)
     {
          for(j=0;j<c;j++)
          {
printf("%d\t",a[i][j]);
```

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```
}
printf("\n");
}
printf("enter whose address want to search : \n");
scanf("%d",&f);

for(i=0;i<r;i++)
{
for (j = 0; j < c; j++)
{
    if (f==a[i][j])
    printf("row[%d] column[%d]= value %d ",i,j,f);
}
}
return 0;
}
```

Output:-

```
Enter size of  row: 2

Enter size of column: 2

Enter the elements of array:

11

12

13

14

your entered matrix is :

11      12

13      14

enter whose address want to search :

14
```

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row[1] column[1]= value 14

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