ASSIGNMENT - 07

Q1. Read n number of value in an array and display it in reverse order.

```
#include <stdio.h>
int main() {
int arr[] = {1, 2, 3, 4, 5};
printf("number of an array: \n");
for (int i = 0; i < 5; i++) {
printf("%d ", arr[i]);        }
printf("\n");
printf("Array in reverse order: \n");
for (int i = 5-1; i >= 0; i--) {
printf("%d ", arr[i]);        }
 return 0;
 }
```

OUTPUT :

```
Number of an array:
1 2 3 4 5
Array in reverse order:
5 4 3 2 1
```

Q2. Find the sum of all element 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 : 10
Enter 10 elements in  the array : 1 2 3 4 5 6 7 8
9  10
Sum of all elements of array = 55
```

Q3. Copy the elements of one array into another array.

```
#include <stdio.h>
int main()
{
int i, Size, a[20], b[20];
printf("\n Please Enter the Array Size \n");
scanf("%d", &Size);
printf("\n Please Enter the Array Elements \n");
for(i = 0; i < Size; i++)  {
scanf("%d", &a[i]);     }
for(i = 0; i < Size; i++)  {
b[i] = a[i];     }
printf("\n Elements of Second Array are: \n");
for(i = 0; i < Size; i++)  {
printf("\n Value Inside Array b[%d] = %d", i, b[i]);      }
return 0;
}
```

OUTPUT :

```
Please Enter the Array Size
5

 Please Enter the Array Elements
1 2 3 4 5
Elements of Second Array are:

 Value Inside Array b[0] = 1
 Value Inside Array b[1] = 2
 Value Inside Array b[2] = 3
 Value Inside Array b[3] = 4
 Value Inside Array b[4] = 5
```

Q4. 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 Please Enter Number of elements in an array :   ");
scanf("%d", &Size);
printf("\n Please 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 :

```
Please Enter Number of elements in an array :   10
 Please Enter 10 elements of an Array :  1 1 2 2 3 4 3 5 6 7 8 9 10
 Total Number of Duplicate Elements in this Array  =  3
```

Q5. Find the maximum and minimum element in an array.

```
#include <stdio.h>
int main() {
int arr[20];
int i, max, min, size;
printf("Enter size of the array: ");
scanf("%d", &size);
printf("Enter elements in the array: ");
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("Maximum element = %d\n", max);
printf("Minimum element = %d", min);
return 0;}
```

OUTPUT :

```
Enter size of the array: 10
Enter elements in the array: 1 2 3 4 56 76 89 90
21 10
Maximum element = 90
Minimum element = 1
```

Q6. Separate odd and even integers in separate arrays.

```
#include <stdio.h>
int main() {
int arr1[10], arr2[10], arr3[10];
int i,j=0,k=0,n;
printf("Input  the number of elements to be stored in the array :");
scanf("%d",&n);
 printf("Input  %d elements in the array :\n",n);
for(i=0;i<n;i++)          {
printf("element - %d : ",i);
scanf("%d",&arr1[i]);             }
for(i=0;i<n;i++)    {
if (arr1[i]%2 == 0)             {
 arr2[j] = arr1[i];
j++;              }
else              {
arr3[k] = arr1[i];
 k++;             }    }
printf("\nThe  Even elements are : \n");    for(i=0;i<j;i++)    {
printf("%d  ",arr2[i]);     }
 printf("\nThe  Odd elements are :\n");
 for(i=0;i<k;i++)    {
printf("%d  ", arr3[i]);     }
 printf("\n\n");
 return 0;}
```

OUTPUT :

```
Input the number of elements to be stored in the
array :5
Input 5 elements in the array :
element - 0 : 22
element - 1 : 59
element - 2 : 87
element - 3 : 34
element - 4 : 55
The Even elements are :
22 34
The Odd elements are :
59 87 55
```

Q7. Insert new value in the array.

```
#include <stdio.h>
int main() {
int arr[100] = { 0 };
int i, x, pos, n = 10;
printf("Number  of elements :");
for (i = 0; i < 10; i++)
arr[i] = i + 1;
for (i = 0; i < n; i++)
printf("%d ", arr[i]);
printf("\n");
printf("Element after inserted ");
x = 50;
pos = 5;
n++;
for (i = n-1; i >= pos; i--)
arr[i] = arr[i - 1];
arr[pos - 1] = x;
for (i = 0; i < n; i++)
 printf("%d ", arr[i]);
printf("\n");
return 0
;}
```

OUTPUT :

Number of elements :1 2 3 4 5 6 7 8 9 10
Element after inserted 1 2 3 4 50 5 6 7 8 9 10

Q8. Delete an element at desired position from an array.

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

OUTPUT :

```
Enter number of elements in array :5
Enter 5 elements :12 13 34 45 32
Enter the location where you wish to
delete element :4
Resultant array:
12
13
34
32
```

Q9. Find the second largest element in an array.

```
#include <stdio.h>
int main() {
int array[10] = {101, 11, 50, 69, 9, 0};
int i, largest, second;
if(array[0] > array[1]) {
largest = array[0];
second  = array[1];   }
else {
largest = array[1];
second  = array[0];   }
for(i = 2; i < 10; 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);
return 0;
}
```

OUTPUT :

```
Largest - 101
Second - 69
```

Q10. Find the median of two sorted arrays of Same size.

```
#include <stdio.h>
int Calculate_median(int a1[], int a2[], int n){int i = 0;int j = 0;
int cnt;
int x = -1, y = -1;
for (cnt = 0; cnt <= n; cnt++){
if (i == n){x = y;y = a2[0];
break;}
else if (j == n){x = y;y = a1[0];
break;}
if (a1[i] < a2[j]){
x = y;
y = a1[i];i++;}    else{
x = y;
y = a2[j];j++;}}}
int main(){
int n, i;
printf("Enter the size: ");
scanf("%d",&n);
int a1[n], a2[n];
printf("\n Enter the first Array elements: \n");
for(i=0; i<n; i++)
scanf("%d",&a1[i]);
printf("\n Enter the Second Array elements: \n");
for(i=0; i<n; i++)
scanf("%d",&a2[i]);
printf("Median: %d", Calculate_median(a1, a2, n));return 0;}
```

OUTPUT :

```
Enter the size: 4

 Enter the first Array elements:
11 2 15 6
Enter the Second Array elements:
2 30 6 7
Median: 5
```

Q11. 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 printing  result
 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=
3    9
10  5
enter the second matrix element=
2    10
4    1
Multiply  of the matrix=
42        39
40        105
```

Q12. Find transpose of a given matrix.

```
#include <stdio.h>
int main() {
int m, n, c, d, matrix[10][10], transpose[10][10];
printf("Enter the number of rows and columns of a matrix\n");
scanf("%d%d", &m, &n);
printf("Enter elements of the matrix\n");
for (c = 0; c < m; c++)
for (d = 0; d < n; d++)
scanf("%d", &matrix[c][d]);
for (c = 0; c < m; c++)
for (d = 0; d < n; d++)
transpose[d][c] = matrix[c][d];
printf("Transpose of the matrix:\n");
for (c = 0; c < n; c++) {
for (d = 0; d < m; d++)
printf("%d\t", transpose[c][d]);
printf("\n");   }
return 0;}
```

OUTPUT :

```
Enter the number of rows and columns of a matrix
3 3
Enter elements of the matrix
1 2 3
3 2 2
1 2 3
Transpose of the matrix:
1       3       1
2       2       2
3       2       3
```

Q13. 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");  }// calculate the sum of left diagonals
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] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 1
The matrix is :
   1   2
   3   1
Addition of the  left Diagonal elements is :5
```

Q14. Check whether a given matrix is an identity matrix.

```
#include <stdio.h>
int main() {
int i, j, rows, columns, a[10][10], Flag = 1;
printf("\n Please Enter Number of rows and columns : ");
scanf("%d %d", &i, &j);
printf("\n Please 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 :

```
Please Enter Number of rows and columns
:  3 3
Please Enter the Matrix Elements
1 0 0
0 1 0
0 0 1
The Matrix that you entered is an Identity
Matrix
```

Q15. 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) {
if (n == 0)
return -1;
int smallest = mat[0][0], largest = mat[n - 1][n - 1];
if (x < smallest || x > largest)
return -1;
int i = 0, j = n - 1;
while (i < n && j >= 0)      {
if (mat[i][j] == x)          {
printf("\n Found at %d, %d", i, j);
 return 1;          }
if (mat[i][j] > x)
 j--;
else // if mat[i][j] < x
 i++;     }
 printf("n Element not found");
return 0; // if ( i==n || j== -1 ) }
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 :

Found at 2, 1