ASSIGNMENT-7

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

```
#include <stdio.h>

int main(){

   int i,n,a[100];

      printf("Read n number of values in an array and display it in reverse order:\n");

   printf("Input the number of elements to store in the array :");

   scanf("%d",&n);

   printf("Input %d number of elements in the array :\n",n);

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

           printf("element - %d : ",i);

           scanf("%d",&a[i]);

   }

   printf("\nThe values store into the array are : \n");

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

            printf("% 5d",a[i]);

}

   printf("\n\nThe values store into the array in reverse are :\n");

   for(i=n-1;i>=0;i--){

            printf("% 5d",a[i]);

}

   printf("\n\n");

   return 0;
```

```
}
```

```
Read n number of values in an array and display it in reverse order:

Input the number of elements to store in the array :4

Input 4 number of elements in the array :

element -
  0 : 1

element -
  1 : 2

element -
  2 : 3

element -
  3 : 4




The values store into the array are :

       1       2       3       4



The values store into the array in reverse are :

       4       3       2       1
```

Q.2 Find the sum of all elements of the array.

```
#include <stdio.h>
int main(){
   int a[100];
   int i, n, sum=0;
      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",&a[i]);
             }
       for(i=0; i<n; i++) {
          sum += a[i];
       }
   printf("Sum of all elements stored in the array is : %d\n\n", sum);
   return 0;
}
```

```
Input the number of elements to be stored in the array :4

Input 4 elements in the array :

element -
 0 : 1

element -
 1 : 2

element -
 2 : 3
```

```
element  -
  3  :  4


Sum  of  all  elements  stored  in  the  array  is  :  10
```

Q.3 Copy the elements of one array into another array.

```
#include <stdio.h>
int main(){
    int arr1[100], arr2[100];
    int i, 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++){
        arr2[i] = arr1[i];
    }
    printf("\nThe elements stored in the first array are :\n");
    for(i=0; i<n; i++) {
        printf("% 5d", arr1[i]);
    }
    printf("\n\nThe elements copied into the second array are :\n");
    for(i=0; i<n; i++){
        printf("% 5d", arr2[i]);
    }
            printf("\n\n");
```

```
    return 0;
}
```

```
Input the number of elements to be stored in the array :4

Input 4 elements in the array :

element -
 0 : 1

element -
 1 : 2

element -
 2 : 3

element -
 3 : 4

The elements stored in the first array are :

      1       2       3       4

The elements copied into the second array are :

      1       2       3       4
```

Q.4 Count a total number of duplicate elements in an array.

```
#include <stdio.h>
int main(){
    int arr1[100];
          int arr2[100];
          int arr3[100];
    int n,mm=1,ctr=0;
    int i, j;
       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++){
                   arr2[i]=arr1[i];
                   arr3[i]=0;
        }
          for(i=0;i<n; i++) {
                   for(j=0;j<n;j++){
                                    if(arr1[i]==arr2[j]){
                                    arr3[j]=mm;
                                    mm++;
                                    }
                           }
                           mm=1;
```

```
      }
   for(i=0; i<n; i++) {
     if(arr3[i]==2){
ctr++;
}
   }
     printf("The total number of duplicate elements found in the array is: %d \n",
ctr);


          printf("\n\n");
          return 0;
}
```

```
Input the number of elements to be stored in the array :7

Input 7 elements in the array :

element -
 0 : 1

element -
 1 : 2

element -
 2 : 3

element -
 3 : 4

element -
 4 : 5

element -
 5 : 4
```

```
element  -
  6  :  2


The  total  number  of  duplicate  elements  found  in  the  array  is:  2
```

Q.5 Find the maximum and minimum element in an array.

```
#include <stdio.h>
int main(){
    int arr1[100];
    int i, mx, mn, 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]);
              }
    mx = arr1[0];
    mn = arr1[0];
    for(i=1; i<n; i++){
       if(arr1[i]>mx){
          mx = arr1[i];
       }
       if(arr1[i]<mn){
```

```
        mn = arr1[i];
      }
   }
   printf("Maximum element is : %d\n", mx);
   printf("Minimum element is : %d\n\n", mn);
   return 0;
}
```

```
Input the number of elements to be stored in the array :4

Input 4 elements in the array :

element -
 0 : 1

element -
 1 : 2

element -
 2 : 3

element -
 3 : 4

Maximum element is : 4

Minimum element is : 1
```

Q.6 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; }
```

```
Input the number of elements to be stored in the array :4
```

```
Input  4  elements  in  the  array  :


element  -
  0  :  1


element  -
  1  :  2


element  -
  2  :  3


element  -
  3  :  4







The  Even  elements  are  :


2  4



The  Odd  elements  are  :


1  3
```

Q.7 Insert new values in the array.

```
#include <stdio.h>

int main()

{

   int arr1[100],i,n,p,x;

       printf("Input the size of array : ");

       scanf("%d", &n);

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

```
            printf("element - %d : ",i);
            scanf("%d",&arr1[i]);
        }
  printf("Input the value to be inserted : ");
  scanf("%d",&x);
  printf("Input the Position, where the value to be inserted :");
  scanf("%d",&p);
  printf("The current list of the array :\n");
  for(i=0;i<n;i++)
    printf("% 5d",arr1[i]);
  for(i=n;i>=p;i--)
    arr1[i]= arr1[i-1];
    arr1[p-1]=x;
  printf("\n\nAfter Insert the element the new list is :\n");
  for(i=0;i<=n;i++)
    printf("% 5d",arr1[i]);
        printf("\n\n");
        return 0;
}
```

```
Input the size of array : 4


element -
 0 : 1


element -
 1 : 2


element -
 2 : 3
```

```
element  -
  3  :  4


Input  the  value  to  be  inserted  :  7


Input  the  Position,  where  the  value  to  be  inserted  :2


The  current  list  of  the  array  :


       1       2       3       4









After  Insert  the  element  the  new  list  is  :


       1       7       2       3       4
```

Q.8 Delete an element at desired position from an array.

```
#include <stdio.h>
int main(){
  int arr1[50],i,pos,n;
      printf("Input the size of array : ");
      scanf("%d", &n);
      printf("Input %d elements in the array in ascending order:\n",n);
      for(i=0;i<n;i++){
              printf("element - %d : ",i);
              scanf("%d",&arr1[i]);
             }
  printf("\nInput the position where to delete: ");
  scanf("%d",&pos);
  i=0;
```

```
  while(i!=pos-1)
        i++;
  while(i<n){
        arr1[i]=arr1[i+1];
        i++;
  }
  n--;
   printf("\nThe new list is : ");
  for(i=0;i<n;i++){
                  printf("  %d",arr1[i]);
                }
        printf("\n\n");
    return 0;
}
```

```
Input  the  size  of  array  :  4


Input  4  elements  in  the  array  in  ascending  order:


element  -
  0  :  1


element  -
  1  :  2


element  -
  2  :  3


element  -
  3  :  4
```

```
Input  the  position  where  to  delete:  2




The  new  list  is  :      1    3    4
```

Q.9 Find the second largest element in an array.

```
#include <stdio.h>
int main(){
  int arr1[50],n,i,j=0,lrg,lrg2nd;
       printf("Input the size of 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]);
              }
   lrg=0;
  for(i=0;i<n;i++){
      if(lrg<arr1[i]){
           lrg=arr1[i];
           j = i;
      }
  }
   lrg2nd=0;
  for(i=0;i<n;i++){
```

```
    if(i==j){
        i++;  /* ignoring the largest element */
                i--;
      }
     else{
        if(lrg2nd<arr1[i]){
            lrg2nd=arr1[i];
          }
      }
  }
  printf("The Second largest element in the array is :  %d \n\n", lrg2nd);
  return 0;
}
```

```
Input  the  size  of  array  :  4


Input  4  elements  in  the  array  :


element  -
  0  :  4


element  -
  1  :  3


element  -
  2  :  2


element  -
  3  :  1


The  Second  largest  element  in  the  array  is  :    3
```

Q.10 Find the median of two sorted arrays of same size.

```
#include <stdio.h>
int max(int a, int b) {
   return ((a > b) ? a : b);
}
int min(int a, int b) {
   return ((a < b) ? a : b);
}
int median(int arr[], int size) {
   if (size % 2 == 0)
         return (arr[size/2] + arr[size/2-1])/2;
   else
         return arr[size/2];
}
int median2SortedArrays(int arr1[], int arr2[], int size) {
   int med1;
   int med2;
   if(size <= 0) return -1;
   if(size == 1) return (arr1[0] + arr2[0])/2;
   if (size == 2) return (max(arr1[0], arr2[0]) + min(arr1[1], arr2[1])) / 2;
   med1 = median(arr1, size);
   med2 = median(arr2, size);
   if(med1 == med2) return med1;
   if (med1 < med2) {
      return median2SortedArrays(arr1 + size/2, arr2, size - size/2);
   }
   else {
      return median2SortedArrays(arr2 + size/2, arr1, size - size/2);
   }
```

```
}


int main() {
   int i,m,n;
   int arr1[] = {1, 5, 13, 24, 35};
   int arr2[] = {3, 8, 15, 17, 32};
   m = sizeof(arr1) / sizeof(arr1[0]);
   n = sizeof(arr2) / sizeof(arr2[0]);
         printf("The given array - 1 is :  ");
         for(i = 0; i < m; i++){
         printf("%d  ", arr1[i]);
    }
         printf("\n");
         printf("The given array - 2 is :  ");
         for(i = 0; i < n; i++){
         printf("%d  ", arr2[i]);
    }
         printf("\n");
   printf("\nThe Median of the 2 sorted arrays is: %d",median2SortedArrays(arr1,
arr2, n));
   printf("\n");
   return 0;
}
```

```
The  given  array  -
  1  is  :    1    5    13    24    35


The  given  array  -
  2  is  :    3    8    15    17    32
```

```
The Median of the 2 sorted arrays is: 14
```

Q.11 Multiplication of two square matrixes.

```
#include <stdio.h>
int main(){
  int arr1[50][50],brr1[50][50],crr1[50][50],i,j,k,r1,c1,r2,c2,sum=0;
  printf("\nInput the rows and columns of first matrix : ");
  scanf("%d %d",&r1,&c1);
  printf("\nInput the rows and columns of second matrix : ");
  scanf("%d %d",&r2,&c2);
  if(c1!=r2){
     printf("Mutiplication of Matrix is not possible.");
     printf("\nColumn of first matrix and row of second matrix must be same.");
  }
  else{
      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("\n Input elements in the second matrix :\n");
      for(i=0;i<r2;i++){
          for(j=0;j<c2;j++){
                  printf("element - [%d],[%d] : ",i,j);
                  scanf("%d",&brr1[i][j]);
```

```
        }
    }
      printf("\nThe First matrix is :\n");
            for(i=0;i<r1;i++){
            printf("\n");
            for(j=0;j<c1;j++)
    printf("%d\t",arr1[i][j]);
            }
    printf("\nThe Second matrix is :\n");
            for(i=0;i<r2;i++){
            printf("\n");
            for(j=0;j<c2;j++)
            printf("%d\t",brr1[i][j]);
            }
  for(i=0;i<r1;i++)
    for(j=0;j<c2;j++)
     crr1[i][j]=0;
      for(i=0;i<r1;i++)  {
          for(j=0;j<c2;j++){
            sum=0;
              for(k=0;k<c1;k++)
                sum=sum+arr1[i][k]*brr1[k][j];
                crr1[i][j]=sum;
            }
        }
printf("\nThe multiplication of two matrices is : \n");
for(i=0;i<r1;i++){
    printf("\n");
```

```
      for(j=0;j<c2;j++){
         printf("%d\t",crr1[i][j]);
       }
    }
  }
printf("\n\n");
return 0;
}
```

```
Input the rows and columns of first matrix : 2

2




Input the rows and columns of second matrix : 1

2


Mutiplication of Matrix is not possible.

Column of first matrix and row of second matrix must be same.
```

Q.12 Find transpose of a given matrix.

```
#include <stdio.h>
int main(){
  int arr1[50][50],brr1[50][50],i,j,r,c;
```

```
        printf("\nInput the rows and columns of the matrix : ");
        scanf("%d %d",&r,&c);
        printf("Input elements in the first matrix :\n");
        for(i=0;i<r;i++){
            for(j=0;j<c;j++){
                    printf("element - [%d],[%d] : ",i,j);
                    scanf("%d",&arr1[i][j]);
            }
         }
            printf("\nThe matrix is :\n");
                    for(i=0;i<r;i++){
                    printf("\n");
                    for(j=0;j<c;j++)
           printf("%d\t",arr1[i][j]);}
  for(i=0;i<r;i++){
      for(j=0;j<c;j++){
                  brr1[j][i]=arr1[i][j];}
      }
      printf("\n\nThe transpose of a matrix is : ");
      for(i=0;i<c;i++){
      printf("\n");
      for(j=0;j<r;j++){
          printf("%d\t",brr1[i][j]); }
   }
      printf("\n\n");
      return 0;
}
```

```
Input the rows and columns of the matrix : 2


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  transpose  of  a  matrix  is  :


1              3


2              4
```

Q.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;
   }
```

```
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
```

Q.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;
}
```

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

Input number of Columns for the matrix :3

Input elements in the first matrix :

element -
  [0],[0] : 1

element -
  [0],[1] : 2

element -
  [0],[2] : 3

element -
  [1],[0] : 4

element -
  [1],[1] : 5

element -
  [1],[2] : 6
```

```
The  matrix  is  :

     1      2      3

     4      5      6

  The  matrix  is  not  an  identity  matrix.
```

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

```
#include <stdio.h>
int searchElement(int arr2D[4][4], int n, int x){
   int i = 0, j = n-1;
   while ( i < n && j >= 0 ){
      if ( arr2D[i][j] == x ){
         printf("\nThe element Found at the position in the matrix is:  %d, %d", i, j);
         return 1;
      }
      if ( arr2D[i][j] < x )
        j--;
      else
        i++;
   }
   return 0;
}

int main(){
  int arr2D[4][4] = { {15, 23, 31, 39},
                {18, 26, 36, 43},
                {25, 28, 37, 48},
```

```
                {30, 34, 39, 50},
              };
int i,j,v;
v=37;
        printf("The given array in matrix form is :  \n");
        for(i = 0; i < 4; i++){
        for (j=0;j<4;j++){
        printf("%d  ", arr2D[i][j]);
    }
        printf("\n");}
  printf("The given value for searching is: %d",v);
  searchElement(arr2D, 4, v);
  return 0;}
```

```
The  given  array  in  matrix  form  is  :

15    23    31    39

18    26    36    43

25    28    37    48

30    34    39    50

The  given  value  for  searching  is:  37
```