Lab task 1

1).

```
#include <stdio.h>
int main() {
    int n;
    printf("enter n=");
    scanf("%d",&n);
    int arr[n];
    for(int i=0;i<=n-1;i++){
     printf("enter element%d=",i+1);
     scanf("%d",&arr[i]);
    }
for(int i=0;i<=n-1;i++){
        printf("%d",arr[i]);
    }
    return 0;
}
```

2)

```
#include <stdio.h>
int main() {
    int n;
    printf("enter n=");
```

```
    scanf("%d",&n);
    int arr[n];
    for(int i=0;i<=n-1;i++){
     printf("enter element%d=",i+1);
     scanf("%d",&arr[i]);
    }
for(int i=0;i<=n-1;i++){
        printf("%d",arr[i]);
    }
   int del;
    printf("enter del=");
    scanf("%d",&del);
    if(del>0){
    for(int i=0;i<=del-1;i++){
        printf("%d\n",arr[i]);
    }
    for(int i=del+1;i<=n-1;i++){
        printf("%d\n",arr[i]);
    }
    }
    else{
```

```
        for(int i=1;i<=n-1;i++){
            printf("%d\n",arr[i]);
        }
    }
    return 0;
}
```

3)

```
#include <stdio.h>
int main() {
    int n;
    printf("enter n=");
    scanf("%d",&n);
    int arr[n];
    for(int i=0;i<=n-1;i++){
     printf("enter element%d=",i+1);
     scanf("%d",&arr[i]);
    }
for(int i=0;i<=n-1;i++){
        printf("%d",arr[i]);
    }
    int position;
    int number;
```

```
    printf("enter position=");
    scanf("%d",&position);
    printf("enter number=");
    scanf("%d",&number);
    for (int i =n-1; i>=position; i--) {
        arr[i+1] =arr[i];
    }
    arr[position]=number;
    n++;
    for (int i = 0;i<n; i++) {
        printf("%d ", arr[i]);
    }
    return 0;
}
```

4)

```
#include<stdio.h>
int main() {
    int n;
    printf("enter n=");
    scanf("%d",&n);
```

```
    int arr[n];
    for(int i=0;i<=n-1;i++){
     printf("enter element%d=",i+1);
     scanf("%d",&arr[i]);
    }
for(int i=0;i<=n-1;i++){
        printf("%d",arr[i]);
    }
    printf("reverse=");
for(int i=n-1;i>=0;i--){
    printf("%d",arr[i]);
}
return 0;
}
```

5)

```
#include <stdio.h>

int main()
{
    int x;
    printf("enter x=");
```

```
  scanf("%d",&x);
  int arr[x];
  for(int i=0;i<=x-1;i++){
printf("enter element%d=",i+1);
 scanf("%d",&arr[i]);
  }
  for(int i=0;i<=x-1;i++){
      printf("%d",arr[i]);
  }
  int length = sizeof(arr)/sizeof(arr[0]);
  int n ;
  printf("enter n=");
  scanf("%d",&n);
  printf("Original array: \n");
  for (int i = 0; i < length; i++) {
      printf("%d ", arr[i]);
  }
  for(int i = 0; i < n; i++){
      int j, first;
      first = arr[0];
    for(j = 0; j < length-1; j++){
```

```
        arr[j] = arr[j+1];
    }
    arr[j] = first;
}
printf("\n");
printf("Array after left rotation: \n");
 int nr;
 printf("enter nr=");
scanf("%d",&nr);
for(int i = 0; i < length; i++){
    printf("%d ", arr[i]);
}
for(int i = 0; i < nr; i++){
    int j, last;
    last = arr[length-1];
    for(j = length-1; j > 0; j--){
        arr[j] = arr[j-1];
    }
    arr[0] = last;
}
```

```
    printf("\n");
    printf("Array after right rotation: \n");
    for(int i = 0; i< length; i++){
        printf("%d ", arr[i]);
    }
    return 0;
}
6)
#include <stdio.h>
int main()
{
    int n;
scanf("%d", &n);
    printf("Input %d elements in the array :
\n", n);
    int arr1[n], arr2[n], arr3[n];
    int i;
    int j = 0;
    int k = 0;
    printf("\n\nSeparate odd and even
integers in separate arrays:\n");
```

```
    printf("Input the number of elements to
be stored in the array :");
    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;
}
#include <stdio.h>

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

    int arr[n];
    for (int i = 0; i < n; i++) {
```

```
        printf("Element %d: ", i + 1);
        scanf("%d", &arr[i]);
    }
    int t;
 for(int i=0;i<=n-2;i++){
     for(int j=0;j<=n-2-i;j++){
         if(arr[j]>arr[j+1]){
              t=arr[j];
             arr[j]=arr[j+1];
             arr[j+1]=t;
         }
     }
 }
 for(int i=0;i<=n-1;i++){
printf("%d\n",arr[i]);
 }
 return 0;
}
```

Lab task2)

1) `#include <stdio.h>`

```
int main() {
    int n;
    printf("enter n=");
    scanf("%d",&n);
    int arr[n];
    for(int i=0;i<=n-1;i++){
        printf("enter %d",i+1);
        scanf("%d",&arr[i]);
    }
    for(int i=0;i<=n-1;i++){
        printf("%d",arr[i]);
    }
    int av;
    printf("enter av=");
    scanf("%d",&av);
    int sum=0;
  for(int i=0;i<=av-1;i++){
      sum=sum+arr[i];
  }
  float average=sum/(av);
  printf("the average =%f",average);
```

```
    return 0;
}

2)#include <stdio.h>
int main()
{
    int i;
    int j;
    int Count;
    int n;
    printf("\n Enter the number of elements
in an array  :   ");
    scanf("%d", &n);
    int a[n], Freq[n];
    printf("\n Enter the elements of an Array
:  ");
    for (i = 0; i < n; i++)
    {
            scanf("%d", &a[i]);
            Freq[i] = -1;
      }
```

```
    for (i = 0; i < n; i++)
    {
        Count = 1;
        for(j = i + 1; j < n; j++)
        {
            if(a[i] == a[j])
            {
                Count++;
                Freq[j] = 0;
            }
        }
        if(Freq[i] != 0)
        {
            Freq[i] = Count;
        }
    }
     printf("\n The Frequency of the
elements in this Array is : \n");
     for (i = 0; i < n; i++)
      {
          if(Freq[i] != 0)
```

```
        {
            printf("%d Occurs %d Times \n",
a[i], Freq[i]);
        }
      }
     return 0;
}
3)#include <stdio.h>
#define MAX 256
int main ()
{
  int arr[MAX][2], brr[MAX][2];
  int k = 0, n, temp, count;
  printf ("\nEnter the number of elements:
\n");
  scanf ("%d", &n);
  printf ("\nEnter the array elements :\n");
  for (int i = 0; i < n; i++)
    {
      scanf ("%d", &arr[i][0]);
      arr[i][1] = 0;
```

```
  }
 for (int i = 0; i < n; i++)
  {
    if (arr[i][1])
  continue;
    count = 1;
    for (int j = i + 1; j < n; j++)
  {
    if (arr[i][0] == arr[j][0])
      {
        arr[j][1] = 1;
        count++;
      }
  }
    brr[k][0] = arr[i][0];
    brr[k][1] = count;
    k++;
  }
 n = k;
 printf ("\nArray Elements and its
frequency:\n");
```

```
  printf (" \nElements   Frequency\n");
  for (int i = 0; i < n; i++)
    {
      printf ("   %d          %d \n", brr[i][0], brr[i]
[1]);
    }
  for (int i = 0; i < n - 1; i++)
    {
      temp = brr[i][1];
      for (int j = i + 1; j < n; j++)
    {
      if (temp < brr[j][1])
        {
          temp = brr[j][1];
          brr[j][1] = brr[i][1];
          brr[i][1] = temp;

          temp = brr[j][0];
          brr[j][0] = brr[i][0];
          brr[i][0] = temp;
        }
```

```
    }
    }
  printf ("\nSorted Array Elements based on
their frequency:\n");
  printf (" Elements   Frequency\n");
  for (int i = 0; i < n; i++)
    {
      printf ("   %d          %d    \n", brr[i][0], brr[i]
[1]);
    }
  printf ("\n Sorted Array based on its
frequency:\n");
  for (int i = 0; i < n; i++)
    {
      while (brr[i][1] != 0)
    {
      printf (" %d  ", brr[i][0]);
      brr[i][1]--;
    }
    }
  return 0;
```

```
}
4)#include <stdio.h>

void bubbleSort(int arr[], int n) {
    int swapCount = 0; // Variable to store
the number of swaps
    for (int i = 0; i < n - 1; i++) {
        // Each pass through the array
        for (int j = 0; j < n - i - 1; j++) {
            // Compare adjacent elements
            if (arr[j] > arr[j + 1]) {
                // Swap elements if they are in
the wrong order
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;

                swapCount++; // Increment the
swap counter
            }
        }
```

```
    }
    // Print the number of swaps
    printf("Number of swaps: %d\n",
swapCount);
}

int main() {
    int n;
    printf("Enter number of elements: ");
    scanf("%d", &n);

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

    bubbleSort(arr, n);

    // Print sorted array
    printf("Sorted array: ");
```

```
    for (int i = 0; i < n; i++) {
        printf("%d ", arr[i]);
    }
    printf("\n");

    return 0;
}
```

5)

```
#include <stdio.h>
void insertionSort(int arr[], int n) {
    int insertionCount = 0;
    for (int i = 1; i < n; i++) {
        int key = arr[i];
        int j = i - 1;
        while (j >= 0 && arr[j] > key) {
            arr[j + 1] = arr[j];
            j = j - 1;
            insertionCount++;
        }

        arr[j + 1] = key;
    }
```

```
    printf("Number of insertions: %d\n",
insertionCount);
}

int main() {
    int n;
    printf("Enter number of elements: ");
    scanf("%d", &n);

    int arr[n];
    printf("Enter elements: ");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    insertionSort(arr, n);
    printf("Sorted array: ");
    for (int i = 0; i < n; i++) {
        printf("%d ", arr[i]);
    }
    printf("\n");
```

```
    return 0;
}
```

6)

```
#include <stdio.h>

int removeDup(int arr[], int n) {
    if (n == 0) return 0;

    int j = 0;
    for (int i = 1; i < n - 1; i++) {

        if (arr[i] != arr[j])
            arr[++j] = arr[i];
    }
    return j + 1;
}

int main() {
    int arr[] = {1, 2, 2, 2, 3, 4, 4, 5};
    int n = sizeof(arr) / sizeof(arr[0]);

    n = removeDup(arr, n);
```

```
    for (int i = 0; i < n; i++)
        printf("%d ", arr[i]);
    return 0;
}
```

7)

```
#include <stdio.h>
#include <stdlib.h>
int compare(const void *a, const void *b) {
    return (*(int*)b - *(int*)a);
}

int main() {
    int n, k;
    printf("Enter number of elements: ");
    scanf("%d", &n);
    printf("Enter the value of k: ");
    scanf("%d", &k);

    int arr[n];
    printf("Enter the elements: ");
    for (int i = 0; i < n; i++) {
```

```
        scanf("%d", &arr[i]);
    }
    qsort(arr, n, sizeof(int), compare);
    printf("The %d-th largest element is:
%d\n", k, arr[k-1]);

    return 0;
}
```