DS Lab 2 Solutions

2.1.1

```c
#include <stdio.h>

int main(){
    int n;
    printf("Enter value of n : ");
    scanf("%d",&n);
    int a[n];
    for(int i=0;i<n;i++){
        printf("Enter element for a[%d] : ",i);
        scanf("%d",&a[i]);
    }
    int key,temp;
    printf("Enter key element : ");
    scanf("%d",&key);
    for(int i=0;i<n-1;i++){
        for(int j=0;j<n-1;j++){
            if(a[j]>a[j+1]){
                temp=a[j];
                a[j]=a[j+1];
                a[j+1]=temp;
            }
        }
    }
    printf("After sorting the elements in the array are\n");
    for(int i=0;i<n;i++){
        printf("Value of a[%d] = %d",i,a[i]);
        printf("\n");
    }
    int mid=(0+n-1)/2,flag=0,pos;
    if(a[mid]==key){
        flag=1;
        pos=mid;
    }
    if(mid<key){
        for(int i=0;i<n;i++){
            if(a[i]==key){
                pos=i;
                flag=1;
            }
        }
    }
    if(flag==1){
        printf("The key element %d is found at the position %d\n",key,pos);

    }
    else{
        printf("The Key element %d is not found in the array\n",key);
    }
}
```

2.1.2

```c
#include <stdio.h>

int main(){
    int n,arr[30],pos,val;
    printf("Enter no of elements in array: ");
    scanf("%d",&n);
    printf("Enter %d elements: ",n);
    for(int i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
    printf("Enter the position where you want to insert: ");
    scanf("%d",&pos);
    printf("Enter the value into that position: ");
    scanf("%d",&val);
    n++;
    for(int i = n-1;i>=pos;i--){
        arr[i]=arr[i-1];
    }
    arr[pos-1]=val;
    printf("Final array is: ");
    for(int i=0;i<n;i++){
        printf("%d ",arr[i]);
    }
    printf("\n");
}
```

2.1.3

```c
#include <stdio.h>



int main(){
    int n,arr[30],pos,i;
    printf("Enter number of elements in array: ");
    scanf("%d",&n);
    printf("Enter %d elements",n);
    for(i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
    printf("Enter the location where you wish to delete element: ");
    scanf("%d",&pos);
    if(pos>=n+1){
        printf("Deletion not possible.\n");
    }
    else{
        for(i=pos-1;i<n-1;i++){
            arr[i]=arr[i+1];
        }
        printf("Resultant array is\n");
        for(i=0;i<n-1;i++){
            printf("%d\n",arr[i]);
        }
    }
}
```

2.2.1

```c
#include <stdio.h>
int main(){
    int i,n,arr[30],key,index,flag;
    printf("Enter n value : ");
    scanf("%d",&n);
    printf("Enter n values in sorted order : ");
    for(i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
    printf("Enter Search Item : ");
    scanf("%d",&key);
    for(i=0;i<n;i++){
        if(arr[i]==key){
            flag=1;
            break;
        }

    }
    if(flag==1){
        printf("Element Index : %d\n",i);
    }
    else{
        printf("Element not found\n");
    }
}
```

2.2.2

```c
#include <stdio.h>
int main(){
    int n,x,index,temp=0;
    int a[10];
    printf("Enter array length n value : ");
    scanf("%d",&n);
    printf("Enter %d array Elements : ",n);
    for(int i=0;i<n;i++){
        scanf("%d",&a[i]);
    }
    printf("Enter inserted Element and Index : ");
    scanf("%d%d",&x,&index);
    printf("Array Elements before Swapping : ");
    a[n]=x;
    int temp1=a[index];
    a[index]=a[n];
    a[n]=temp1;
    n++;
    for(int i=0;i<n;i++){
        printf("%d ",a[i]);
    }
    printf("\n");
    printf("Array Elements After Swapping, Inserted Element : ");
    for(int i=0;i<=n-3;i++){
        for(int j=i+1;j<=n-2;j++){
            if(a[i]>a[j]){
                temp=a[i];
                a[i]=a[j];
                a[j]=temp;
            }
        }
    }
    for(int i=0;i<n;i++){
        printf("%d ",a[i]);
    }
    printf("\n");
}
```

2.2.3

```c
#include <stdio.h>

#define MAX_SIZE 100

int main() {
int n,ele;
    int arr[10];
    printf("Enter size of array: ");
    scanf("%d",&n);
    printf("Enter elements in array: ");
    for(int i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
    printf("Enter element to remove: ");
    scanf("%d",&ele);
    printf("Array after removing %d: ",ele);
    for(int i=0;i<n;i++){
        if(arr[i]!=ele){
            printf("%d ",arr[i]);
        }
    }
```

2.2.4

```c
#include <stdio.h>

// Function to remove all occurrences of an element and replace them with 0
void remove_element(int arr[], int n, int x) {
    int count=0;
    for(int i=0;i<n;i++){
        if(arr[i]!=x){
            arr[count++]=arr[i];
        }

    }
    while(count<n){
        arr[count++]=0;
    }


}

// Function to print an array
void print_array(int arr[], int n) {
    for(int i=0;i<n;i++){
        printf("%d ",arr[i]);
    }
    printf("\n");


}

int main() {
    int n,i,ele;
    printf("Enter the size of array: ");
    scanf("%d",&n);
    printf("Enter the array elements: ");
    int arr[n];
    for(i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
    printf("Enter the element to be removed: ");
    scanf("%d",&ele);

    printf("Array after removing element %d: ",ele);
    remove_element(arr,n,ele);
    print_array(arr,n);

}
```