Assignment 1

Array ADT

2019BTECS00058 (Batch S4)

Code:

```
//Array ADT
#include<bits/stdc++.h>
using namespace std;

void display(int a[], int n)
{
   cout<<"\n";
   for(int i=0; i<n; i++)
   {
      cout<<a[i]<<" ";
   }
   cout<<"\n";
}

void insert(int a[], int n, int index, int value)
{
   int b[n-index-1];
   for(int i=index; i<n-1; i++)
   {
      b[index-i] = a[i];
   }
   a[index] = value;
   for(int i=index; i<n-1; i++)
   {
      a[i+1] = b[i-index];
   }
}

void deleteElement(int a[], int n, int index)
{
   int b[n-index-1];
   for(int i=index+1; i<n; i++)
   {
      b[index+1-i] = a[i];
   }
   for(int i=index; i<n; i++)
```

```
    {
        a[i] = b[i-index];
    }
}

void sort(int a[], int n)
{
    //bubblesort
    int temp;
    for(int i=0; i<n; i++)
    {
        for(int j=0; j<n-1-i; j++)
        {
            if(a[j]>a[j+1]) {
                temp = a[j];
                a[j] = a[j+1];
                a[j+1] = temp;
            }
        }
    }
}

void search(int a[], int n, int value)
{
    int index=-1;
    for(int i=0; i<n; i++)
    {
        if(a[i] == value)
        {
            index = i;
            break;
        }
    }
    if(index == -1)
    {
        cout<<"\nElement Does Not Exist in the Array.\n";
    }
    else
    {
        cout<<"\nElement Exists at Index "<<index<<" in the Array.\n";
    }
}

int main()
```

```
{
   cout<<"-- Array ADT --\n";
   cout<<"Enter Number of Elements of Array: ";
   int n;
   cin>>n;
   int a[n+1];
   cout<<"Enter the Array Elements: ";
   for(int i=0; i<n; i++)
      cin>>a[i];
   int choice;
   cout<<"\nOptions: \n";
   cout<<"1. Display.\n2. Insert.\n3. Delete.\n4. Search.\n5. Sort.\n\n";
   cout<<"Your Choice: ";
   cin>>choice;
   cout<<"\n";
   if(choice==1)
   {
      cout<<"Display Array: ";
      display(a, n);
   }
   else if(choice==2)
   {
      int val, index;
      cout<<"Enter Value of Element to Insert: ";
      cin>>val;
      cout<<"Enter Index of Array where to Insert: ";
      cin>>index;
      insert(a, n+1, index, val);
      cout<<"\nArray After Insertion: ";
      display(a, n+1);
   }
   else if(choice==3)
   {
      int index;
      cout<<"Enter Index of Element to Delete: ";
      cin>>index;
      deleteElement(a, n, index);
      cout<<"\nArray After Deletion: ";
      display(a, n-1);
   }
   else if(choice==4)
   {
      int k;
      cout<<"Enter The Element to Search: ";
```

```
        cin>>k;
        search(a, n, k);
    }
    else if(choice==5)
    {
        cout<<"Sorted Array: ";
        sort(a, n);
        display(a, n);
    }
    else
    {
        cout<<"Invalid Choice. Sending you back.";
        main();
    }
}
```

Output:

```
/home/devz/CLionProjects/untitled/cmake-build-debug/untitled
-- Array ADT --
Enter Number of Elements of Array: 6
Enter the Array Elements: 1 2 3 4 5 6

Options:
1. Display.
2. Insert.
3. Delete.
4. Search.
5. Sort.

Your Choice: 1

Display Array:
1 2 3 4 5 6

Process finished with exit code 0
```

```
/home/devz/CLionProjects/untitled/cmake-build-debug/untitled
-- Array ADT --
Enter Number of Elements of Array: 3
Enter the Array Elements: 1 2 4

Options:
1. Display.
2. Insert.
3. Delete.
4. Search.
5. Sort.

Your Choice: 2

Enter Value of Element to Insert: 3
Enter Index of Array where to Insert: 2

Array After Insertion:
1 2 3 4

Process finished with exit code 0
```

```
/home/devz/CLionProjects/untitled/cmake-build-debug/untitled
-- Array ADT --
Enter Number of Elements of Array: 4
Enter the Array Elements: 1 2 3 4

Options:
1. Display.
2. Insert.
3. Delete.
4. Search.
5. Sort.

Your Choice: 3

Enter Index of Element to Delete: 2

Array After Deletion:
1 2 4

Process finished with exit code 0
```

```
/home/devz/CLionProjects/untitled/cmake-build-debug/untitled
-- Array ADT --
Enter Number of Elements of Array: 6
Enter the Array Elements: 1 2 3 4 5 6

Options:
1. Display.
2. Insert.
3. Delete.
4. Search.
5. Sort.

Your Choice: 4

Enter The Element to Search: 4

Element Exists at Index 3 in the Array.

Process finished with exit code 0
```

```
/home/devz/CLionProjects/untitled/cmake-build-debug/untitled
-- Array ADT --
Enter Number of Elements of Array: 6
Enter the Array Elements: 3 1 4 8 2 5

Options:
1. Display.
2. Insert.
3. Delete.
4. Search.
5. Sort.

Your Choice: 5

Sorted Array:
1 2 3 4 5 8

Process finished with exit code 0
```