



**IQRA NATIONAL UNIVERSITY**  
**Program BS-(EE)**  
**Spring Semester 2019**

**Course title: Data Structures and Algorithms**  
**Instructor: Engr. Bushra Tahir**  
**Date of submission: March 28, 2019**

**Assignment 1**  
**Total Marks: 10**

**Note: Attempt all the given tasks.**

**1. Create a linear array of 5 elements ({1,3,5,7,8}).**

The original array elements are:

```
LA[0] = 1  
LA[1] = 3  
LA[2] = 5  
LA[3] = 7  
LA[4] = 8
```

**2. Insert Operation**

Insert an item=10 at index 3 of the above given array. The output should look like

The array elements after insertion:

```
LA[0] = 1  
LA[1] = 3  
LA[2] = 5  
LA[3] = 10  
LA[4] = 7  
LA[5] = 8
```

**3. Deletion Operation**

Delete the items=5, 10. The output should look like

The array elements after deletion:

```
LA[0] = 1  
LA[1] = 3  
LA[2] = 7  
LA[3] = 8
```

#### 4. Update Operation

Update the item=5 at index 2 with item=10

The array elements after updating:

```
LA[0] = 1  
LA[1] = 3  
LA[2] = 10  
LA[3] = 7  
LA[4] = 8
```

*Hints: Follow the given algorithms to perform the operations*

#### *Algorithm for Insert Operation*

```
1. Start  
2. Set J = N  
3. Set N = N+1  
4. Repeat steps 5 and 6 while J >= K  
5. Set LA[J+1] = LA[J]  
6. Set J = J-1  
7. Set LA[K] = ITEM  
8. Stop
```

#### *Algorithm for Delete Operation*

```
1. Start  
2. Set J = K  
3. Repeat steps 4 and 5 while J < N  
4. Set LA[J] = LA[J + 1]  
5. Set J = J+1  
6. Set N = N-1  
7. Stop
```

#### *Algorithm for Update Operation*

```
1. Start  
2. Set LA[K-1] = ITEM  
3. Stop
```

**Good Luck!**