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SECTION: 20BCS_13_A
SUBJECT: DS LAB

Question 1:

Write a program to perform Insertion and deletion operation where Let LA is a Linear Array (unordered) with N elements and K is a positive integer such that $K \leq N$.

SOLUTION:

ALGORITHM

1. Start
2. Set $J=N$
3. Set $N = N+1$
4. Set $LA[J+1] = LA[J]$
5. Set $J = J-1$
6. Set $LA[K] = ELEMENT$

Deletion Operation

7. Set $LA[J-1] = LA[J]$
8. Set $J = J+1$
9. Set $N = N-1$
10. Set $J=0$
11. Repeat steps 4 and 5 while $J < N$
12. IF $LA[J]$ is equal ITEM THEN GOTO STEP 6
13. Set $J = J + 1$
14. PRINT $J, ELEMENT$

Update Operation

15. Set LA[K-1] = ELEMENT

16. Stop

PROGRAM CODE

```
#include <iostream>
using namespace std;
void inputArray(int arr[], int elements)
{
    cout << "Enter the value of elements" << endl;
    for (int i = 0; i < elements; i++) {
        cin >> arr[i];
    }
}
void insertElement(int arr[], int elements, int x, int n)
{
    cout << "Enter the value of the element you want to insert: "
    << endl;
    cin >> n;
    cout << "Enter the index: " << endl;
    cin >> x;
    for (int i = elements - 1; i >= x; i--)
    {
        arr[i + 1] = arr[i];
    }
    arr[x] = n;
}
void deleteElement(int arr[], int elements, int n)
{
    cout << "Enter the index of the element you want to delete: "
    << endl;
    cin >> n;
    for (int i = n; i < elements - 1; i++) {
        arr[i] = arr[i + 1];
    }
}
void display(int arr[], int elements)
{
    for (int i = 0; i < elements; i++) {
        cout << arr[i] << " ";
    }
}
```

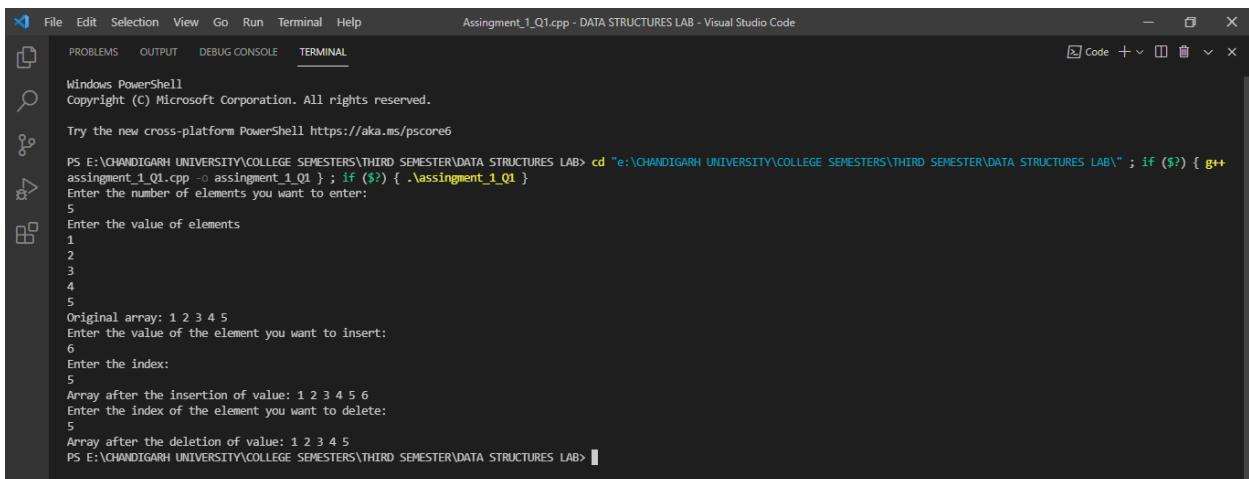
```

}
}

int main()
{
int n, x, elements, end;
int arr[100];
cout << "Enter the number of elements you want to enter: " <<
endl;
cin >> elements;
inputArray(arr, elements);
cout << "Original array: ";
display(arr, elements);
cout << endl;
insertElement(arr, elements, x, n);
cout << "Array after the insertion of value: ";
elements = elements + 1;
display(arr, elements);
cout << endl;
deleteElement(arr, elements, n);
cout << "Array after the deletion of value: ";
elements = elements - 1;
display(arr, elements);
cout << endl;
return 0;
}

```

OUTPUT



```

File Edit Selection View Go Run Terminal Help Assingment_1_Q1.cpp - DATA STRUCTURES LAB - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS E:\CHANDIGARH UNIVERSITY\COLLEGE SEMESTERS\THIRD SEMESTER\DATA STRUCTURES LAB> cd "E:\CHANDIGARH UNIVERSITY\COLLEGE SEMESTERS\THIRD SEMESTER\DATA STRUCTURES LAB\" ; if ($?) { g++ assingment_1_Q1.cpp -o assingment_1_Q1 } ; if ($?) { .\assingment_1_Q1 }
Enter the number of elements you want to enter:
5
Enter the value of elements
1
2
3
4
5
Original array: 1 2 3 4 5
Enter the value of the element you want to insert:
6
Enter the index:
5
Array after the insertion of value: 1 2 3 4 6
Enter the index of the element you want to delete:
5
Array after the deletion of value: 1 2 3 4 5
PS E:\CHANDIGARH UNIVERSITY\COLLEGE SEMESTERS\THIRD SEMESTER\DATA STRUCTURES LAB>

```

