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Assignment:	DSA Lab Task 01

Q#1.Traverse-an-Array

```
#include <iostream>
using namespace std;
int main()
{
    int size; // size variable for getting size of array from user
    system("cls");
    // getting size
    cout << "Enter size of Array:  ";
    cin >> size;
    system("cls");
    int arr[size]; // declaring array
    cout << "Enter Array elements: " << endl;
    // input array elements from user
    for (int i = 0; i < size; i++)
    {
        cout << "arr[" << i << "]  ";
        cin >> arr[i];
    }
    system("cls");
```

```
    // Traverse an Array
    cout << "Array elements are: " << endl;
    for (int i = 0; i < size; i++)
    {
        cout << arr[i] << " ";
    }


    return 0;
}
```

Q#2. Merge-Two-Unsorted-Array

```
#include <iostream>
using namespace std;
int main()
{
    int m, n; // m is size of array A and n is size of array B
    int k;    // counter variable used at the time of merging 2nd array in 3rd array
    cout << "Enter Array A size:  ";
    cin >> m;
    cout << "Enter Array B size:  ";
    cin >> n;
    int size = m + n;
    int A[m], B[n]; // declaring Array A of size m and array B of size n
    int C[size];    // declaring Array C of size m+n (sum of first two array's size)
```

```
// input Array A elements from user
cout << "Enter " << m << " elements of Array A " << endl;
for (int i = 0; i < m; i++)
{
    cin >> A[i];
}
// input Array B elements from user
cout << "Enter " << n << " elements of Array B " << endl;
for (int i = 0; i < n; i++)
{
    cin >> B[i];
}


// copy Array A elements in array C
for (int i = 0; i < m; i++)
{
    C[i] = A[i];
}


// copy array B elements in array C


k = m; // index of array C starts from the end of array A
for (int i = 0; i < n; i++)
{
    C[k] = B[i];
    k = k + 1;
}
```

```
    // Display new array after merging
    cout << "New Array after merging: " << endl;
    for (int i = 0; i < size; i++)
    {
        cout << C[i] << " ";
    }


    return 0;
}
```

Q#3. Merge-Two-Sorted-Array

```
#include <iostream>
using namespace std;
int main()
{
    int m, n; // m is size of array A and n is size of array B


    int i, j, k; // counter variables i for Array B, j for Array B,and k for
Array C
    cout << "Enter Array A size:  ";
    cin >> m;
    cout << "Enter Array B size:  ";
    cin >> n;
    int size = m + n;
    int A[m], B[n]; // declaring Array A of size m and array B of size n
```

```
    int C[size];    // declaring Array C of size m+n (sum of first two array's
size)


    // input Array A elements from user
    cout << "Enter " << m << " elements of Array A " << endl;
    for (int i = 0; i < m; i++)
    {
        cin >> A[i];
    }
    // input Array B elements from user
    cout << "Enter " << n << " elements of Array B " << endl;
    for (int i = 0; i < n; i++)
    {
        cin >> B[i];
    }


    i = j = k = 0; // initialize counter variables


    // copy elements of A and B in array C
    while (i < m && j < n)
    {
        if (A[i] < B[j])
        {
            C[k] = A[i];
            i += 1;
        }
        else
```

```
    {
        C[k] = B[j];
        j += 1;
    }
    k += 1;
}


if (i >= m) // Array A is empty
{
    // copy all elements of B in C
    while (j < n)
    {
        C[k] = B[j];
        j += 1;
        k += 1;
    }
}
if (j >= n) // Array B is empty
{


    // copy all elements of A in C
    while (i < m)
    {
        C[k] = A[i];
        i += 1;
        k += 1;
    }
}
```

```
    cout << "New Array is: " << endl;
    for (int i = 0; i < size; i++)
    {
        cout << C[i] << " ";
    }


    return 0;
}
```

Q#4. Insert-Item-Into-Unsorted-Array

```
#include <iostream>
using namespace std;
int main()
{
    int size;              // used for size of an array
    int index, new_ele, i; // index for index of element that is to placed
                           // new_ele for new element to be placed
                           // i for iterations


    cout << "Enter size of an Array:  ";
    cin >> size; // input size of array
    system("cls");
    int arr[size]; // declaring the array
    cout << "Enter Array elements: " << endl; // getting elements from user
    for (int i = 0; i < size; i++)
```

```
    {
        cout << "arr[" << i << "]  ";
        cin >> arr[i];
    }
    system("cls");
    cout << "\nArray elements Before Inserting: " << endl; // display array
before inserting the element
    for (int i = 0; i < size; i++)
    {
        cout << arr[i] << " ";
    }
    cout << endl;
    system("pause");
    system("cls");
up:
    cout << "Enter Index position to Insert an element:  "; // getting index
position were element should be inserted
    cin >> index;
    if (index >= 0 && index <= size)
    {
        cout << "Enter element to Insert:  "; // getting element from user
        cin >> new_ele;
        system("cls");
        i = size - 1;


        // Logic part
        while (i >= index)
        {
            arr[i + 1] = arr[i];
```

```
            i -= 1;
        }
        arr[index] = new_ele;
        size += 1;
        cout << "\n\nArray elements After Inserting: " << endl; // display after
inserting
        for (int i = 0; i < size; i++)
        {
            cout << arr[i] << " ";
        }
    }
    else
    {
        system("cls");

        goto up;
    }


    return 0;
}
```

Q#5. Insert-Item-Into-Sorted-Array

```
#include <iostream>
using namespace std;
int main()
{
    int size;       // used for size of an array
    int new_ele, i; // new_ele for new element to be placed
                    // i for iterations
```

```
    cout << "Enter size of an Array:  ";
    cin >> size; // input size of array
    system("cls");
    int arr[size]; // declaring the array
    cout << "Enter Array elements in assending order: " << endl;
    for (int i = 0; i < size; i++) // getting elements from user in assending
order
    {
        cout << "arr[" << i << "]  ";
        cin >> arr[i];
    }
    system("cls");
    cout << "\nArray elements Before Inserting: " << endl; // display array
before
    for (int i = 0; i < size; i++)
    {
        cout << arr[i] << " ";
    }
    cout << endl;
    system("pause");
    system("cls");


    cout << "Enter element to Insert:  "; // getting element from user
    cin >> new_ele;
    system("cls");


    // Logic part
```

```
    i = size - 1;
    while (new_ele < arr[i] && i >= 0)
    {
        arr[i + 1] = arr[i];
        i -= 1;
    }
    arr[i + 1] = new_ele;
    size += 1;
    cout << "\n\nArray elements After Inserting: " << endl; // display after
inserting
    for (int i = 0; i < size; i++)
    {
        cout << arr[i] << " ";
    }


    return 0;
}
```

Q#6. Delete-Item-From-An-Array

```
#include <iostream>
using namespace std;
int main()
{
    int pos, size; // pos for index no and size for size of array


    // input array size from user
    cout << "Enter size of an Array:  ";
    cin >> size;
    system("cls");
```

```
int arr[size]; // declaring array of size user want's
cout << "Enter Array elements: " << endl; // input array elements from user
for (int i = 0; i < size; i++)
{
    cout << "arr[" << i << "]  ";
    cin >> arr[i];
}
// display elements before deleting
cout << "\nArray elements Before Deleting: " << endl;
for (int i = 0; i < size; i++)
{
    cout << arr[i] << " ";
}
// getting index from user to delete element
cout << "\nEnter Array Index to delete an element: ";
cin >> pos;
// logic to delete the element
while (pos < size)
{
    arr[pos] = arr[pos + 1];
    pos += 1;
}
size -= 1; // decrement the array size by 1


cout << "\nElement deleted successfully!";
cout << endl;
system("pause");
system("cls");
```

```
    // display elements after deleting
    cout << "\n\nArray elements After Deleting: " << endl;
    for (int i = 0; i < size; i++)
    {
        cout << arr[i] << " ";
    }
    return 0;
}
```