Array as an ADT

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OPERATIONS ON ARRAYS

- Traversing an array
- Inserting an element in an array
- Searching an element in an array
- Deleting an element from an array
- Merging two arrays
- Sorting an array in ascending or descending order

Problem - I

Write a menu driven program in C where all the menu related to the ADT operations are available. When the choice will be given the corresponding message will show at the output console.

```
Step 1: [INITIALIZATION] SET I = lower_bound
Step 2: Repeat Steps 3 to 4 while I <= upper_bound
Step 3:       Apply Process to A[I]
Step 4:       SET  I = I + 1
        [END OF LOOP]
Step 5: EXIT
```

Figure 3.12 Algorithm for array traversal

Problem - II

Include in Problem - I the array traversal function to the array traversal menu.

```
Step 1: Set upper_bound = upper_bound + 1
Step 2: Set A[upper_bound] = VAL
Step 3: EXIT
```

Figure 3.13 Algorithm to append a new element to an existing array

Problem - III

Include in Problem - I the insertion to an array from the end position through a function.

Problem - IV

Include in Problem - I the insertion to an array from the beginning position through a function.

```
Step 1: [INITIALIZATION] SET I = N
Step 2: Repeat Steps 3 and 4 while I >= POS
Step 3:          SET A[I + 1] = A[I]
Step 4:          SET I = I - 1
        [END OF LOOP]
Step 5: SET N = N + 1
Step 6: SET A[POS] = VAL
Step 7: EXIT
```

Figure 3.14 Algorithm to insert an element in the middle of an array.

Problem - V

Include in Problem - I the insertion to an array from the middle of an array through a function.

Problem - VI

Include in Problem - I the insertion to an array after an element of an array through a function.

Problem - VII

Include in Problem - I the insertion to an array before an element of an array through a function.

```
Step 1: SET upper_bound = upper_bound - 1
Step 2: EXIT
```

Figure 3.15 Algorithm to delete the last element of an array

Problem - VIII

Include in Problem - I the deletion to an array from the end an array through a function.

Problem - IX

Include in Problem - I the deletion to an array from the beginning an array through a function.

```
Step 1: [INITIALIZATION] SET I = POS
Step 2: Repeat Steps 3 and 4 while I <= N - 1
Step 3:          SET A[I] = A[I + 1]
Step 4:          SET I = I + 1
        [END OF LOOP]
Step 5: SET N = N - 1
Step 6: EXIT
```

Figure 3.16 Algorithm to delete an element from the middle of an array

Problem - X

Include in Problem - I the deletion to an array from the middle of an array through a function.

Problem - XI

Include in Problem - I the deletion to an array after an element of an array through a function.

Problem - XII

Include in Problem - I the insertion to an array before an element of an array through a function.

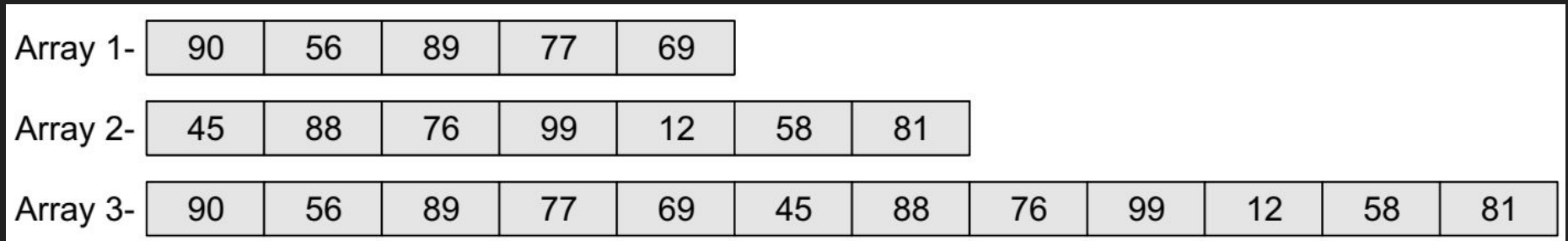

Figure 3.18 Merging of two unsorted arrays

Problem - XIII

Write a program for merging two unsorted array and draw its flow chart and design its algorithm.

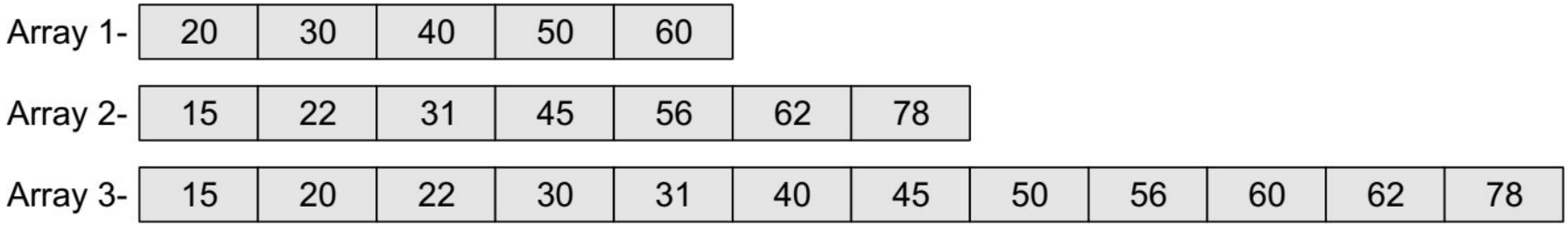

Figure 3.19 Merging of two sorted arrays

Problem - XIV

Write a program for merging two sorted array and draw its flow chart and design its algorithm.