**Array Practice Problems(Homework)**

**test cases** like this:

* First mention **number of elements**
* Then **elements**
* Then show **output**

**1. Create and Print an Array**

Write a program to create an array of size 5, take input from the user, and print the array elements.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5 → Output: 1 2 3 4 5
* Input: 5 and elements 10 20 30 40 50 → Output: 10 20 30 40 50
* Input: 5 and elements 5 4 3 2 1 → Output: 5 4 3 2 1

**2. Find Maximum Element in Array**

Take an array of 10 integers and find the maximum element.  
**Test Cases:**

* Input: 10 and elements 1 5 3 7 9 2 6 0 11 4 → Output: 11
* Input: 10 and elements -5 -2 -9 -1 -6 -3 -8 -4 -7 -10 → Output: -1
* Input: 10 and elements 10 20 30 40 50 60 70 80 90 100 → Output: 100

**3. Sum of All Elements**

Write a program to find the sum of all elements in an array.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5 → Output: 15
* Input: 5 and elements 10 20 30 40 50 → Output: 150
* Input: 5 and elements -1 -2 -3 -4 -5 → Output: -15

**4. Reverse an Array**

Given an array, print it in reverse order.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5 → Output: 5 4 3 2 1
* Input: 5 and elements 10 20 30 40 50 → Output: 50 40 30 20 10
* Input: 5 and elements 5 4 3 2 1 → Output: 1 2 3 4 5

**5. Search an Element (Linear Search)**

Take an array and a key from the user. Search if the key exists in the array or not.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5, Key: 3 → Output: Found
* Input: 5 and elements 10 20 30 40 50, Key: 60 → Output: Not Found
* Input: 5 and elements 5 15 25 35 45, Key: 25 → Output: Found

**6. Count Even and Odd Numbers**

Write a program to count the number of even and odd elements in an array.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5 → Output: Even: 2, Odd: 3
* Input: 6 and elements 2 4 6 8 10 12 → Output: Even: 6, Odd: 0
* Input: 5 and elements 1 3 5 7 9 → Output: Even: 0, Odd: 5

**7. Copy Array Elements**

Create two arrays, copy the elements of the first array into the second array.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5 → Output (copied array): 1 2 3 4 5
* Input: 4 and elements 10 20 30 40 → Output: 10 20 30 40
* Input: 3 and elements 7 8 9 → Output: 7 8 9

**8. Find Second Largest Element**

Find the second largest element in an array without sorting it.  
**Test Cases:**

* Input: 5 and elements 10 20 30 40 50 → Output: 40
* Input: 5 and elements 1 1 1 1 1 → Output: No second largest
* Input: 6 and elements 9 8 7 6 5 4 → Output: 8

**9. Find Minimum Element in Array**

Take an array and find the minimum element.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5 → Output: 1
* Input: 5 and elements 10 20 5 30 40 → Output: 5
* Input: 3 and elements -1 -5 -3 → Output: -5

**10. Count Positive and Negative Numbers**

Write a program to count positive and negative numbers in an array.  
**Test Cases:**

* Input: 5 and elements 1 -2 3 -4 5 → Output: Positive: 3, Negative: 2
* Input: 4 and elements -1 -2 -3 -4 → Output: Positive: 0, Negative: 4
* Input: 3 and elements 5 10 15 → Output: Positive: 3, Negative: 0

**11. Find the Sum of Even Elements Only**

Find the sum of only even numbers from the array.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5 → Output: 6
* Input: 4 and elements 2 4 6 8 → Output: 20
* Input: 5 and elements 1 3 5 7 9 → Output: 0

**12. Find the Average of Array Elements**

Calculate the average value of all the elements of an array.  
**Test Cases:**

* Input: 5 and elements 10 20 30 40 50 → Output: 30
* Input: 4 and elements 1 2 3 4 → Output: 2.5
* Input: 3 and elements 5 15 25 → Output: 15

**13. Count Frequency of an Element**

Given an array, find how many times a particular number appears.  
**Test Cases:**

* Input: 5 and elements 1 2 3 2 5, Search: 2 → Output: 2
* Input: 6 and elements 1 1 1 1 1 1, Search: 1 → Output: 6
* Input: 4 and elements 2 3 4 5, Search: 1 → Output: 0

**14. Find First Repeating Element**

Find the first element that repeats (basic version, no hash maps).  
**Test Cases:**

* Input: 5 and elements 1 2 3 2 1 → Output: 2
* Input: 4 and elements 1 2 3 4 → Output: No repeating element
* Input: 6 and elements 5 6 7 5 8 9 → Output: 5

**15. Separate Even and Odd Numbers**

Place all even numbers in the beginning and odd numbers at the end of the array.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5 → Output: 2 4 1 3 5
* Input: 6 and elements 2 4 6 1 3 5 → Output: 2 4 6 1 3 5
* Input: 4 and elements 1 3 5 7 → Output: 1 3 5 7

**16. Calculate Product of All Elements**

Multiply all elements in the array and print the result.  
**Test Cases:**

* Input: 5 and elements 1 2 3 4 5 → Output: 120
* Input: 3 and elements 2 3 4 → Output: 24
* Input: 4 and elements 1 2 0 4 → Output: 0