```java
import java.util.Scanner;
public class BubbleSortOptimized {
    public static void bubbleSortOptimized(int[] arr) {
        int n = arr.length;
        boolean swapped;
        for (int i = 0; i < n - 1; i++) {
            swapped = false;
            for (int j = 0; j < n - i - 1; j++) {
                if (arr[j] > arr[j + 1]) {
                    int temp = arr[j];
                    arr[j] = arr[j + 1];
                    arr[j + 1] = temp;
                    swapped = true;
                }
            }
            if (!swapped) {
                break;
            }
        }
    }
    public static int binarySearch(int[] arr, int target) {
        int left = 0;
        int right = arr.length - 1;
        while (left <= right) {
            int mid = left + (right - left) / 2;
            if (arr[mid] == target) {
                return mid;
            }
            if (arr[mid] < target) {
                left = mid + 1;
            } else {0
                right = mid - 1;
```

```
java -cp /tmp/H5sQIateCI/BubbleSortOptimized
Enter the number of elements: 5
Enter the elements:
6
3
4
9
7
Sorted array: 3 4 6 7 9
Enter the element to search for: 3
Element 3 found at index 0.

=== Code Execution Successful ===
```

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            }
        }
        return -1;
    }
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the number of elements: ");
        int n = scanner.nextInt();
        int[] inputArray = new int[n];
        System.out.println("Enter the elements:");
        for (int i = 0; i < n; i++) {
            inputArray[i] = scanner.nextInt();
        }
        bubbleSortOptimized(inputArray);
        System.out.print("Sorted array: ");
        for (int num : inputArray) {
            System.out.print(num + " ");
        }
        System.out.println();
        System.out.print("Enter the element to search for: ");
        int target = scanner.nextInt();
        int result = binarySearch(inputArray, target);
        if (result != -1) {
            System.out.println("Element " + target + " found at index " +
                result + ".");
        } else {
            System.out.println("Element " + target + " not found in the array."
                );
        }
        scanner.close();
    }
}
```