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1  /* PRACTICAL-8: Implementation of Searching techniques.
2  (a) Sequential Search
3  (b) Binary Search.
4
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8
9  // CODE:
10
11 import java.util.Scanner;
12 public class practical8 {
13     // I. Sequential Search
14     public static int sequentialSearch(int[] arr, int target) {
15         for (int i = 0; i < arr.length; i++) {
16             if (arr[i] == target) {
17                 return i;
18             }
19         }
20         return -1;
21     }
22
23     // II. Binary Search
24     public static int binarySearch(int[] arr, int target) {
25         int left = 0;
26         int right = arr.length - 1;
27         while (left <= right) {
28             int mid = left + (right - left) / 2;
29             if (arr[mid] == target) {
30                 return mid;
31             } else if (arr[mid] < target) {
32                 left = mid + 1;
33             } else {
34                 right = mid - 1;
35             }
36         }
37         return -1;
38     }
39
40     private static String arrayToString(int[] arr) {
41         StringBuilder sb = new StringBuilder();
42         for (int num : arr) {
43             sb.append(num).append(" ");
44         }
45         return sb.toString();
46     }
47
48     public static void main(String[] args) {
49         Scanner scanner = new Scanner(System.in);
50         System.out.print("Enter the size of the array: ");
51         int size = scanner.nextInt();
52         int[] arr = new int[size];
53         System.out.println("Enter the elements of the array:");
54         for (int i = 0; i < size; i++) {
55             arr[i] = scanner.nextInt();
56         }
57         System.out.println("Sorting the array...");
58         bubbleSort(arr);

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59 System.out.println("Sorted Array:");
60 System.out.println(arrayToString(arr));
61 System.out.println("\nChoose searching technique:");
62 System.out.println("1. Sequential Search");
63 System.out.println("2. Binary Search");
64 System.out.print("Enter your choice: ");
65 int choice = scanner.nextInt();
66 System.out.print("Enter the target element to search: ");
67 int target = scanner.nextInt();
68 int index = -1;
69 switch (choice) {
70     case 1:
71         System.out.println("\nApplying Sequential Search:");
72         index = sequentialSearch(arr, target);
73         break;
74     case 2:
75         System.out.println("\nApplying Binary Search:");
76         index = binarySearch(arr, target);
77         break;
78     default:
79         System.out.println("Invalid choice!");
80 }
81 if (index != -1) {
82     System.out.println("Element found at index: " + index);
83 } else {
84     System.out.println("Element not found in the array.");
85 }
86 scanner.close();
87 }
88 private static void bubbleSort(int[] arr) {
89     int n = arr.length;
90     for (int i = 0; i < n - 1; i++) {
91         for (int j = 0; j < n - i - 1; j++) {
92             if (arr[j] > arr[j + 1]) {
93                 int temp = arr[j];
94                 arr[j] = arr[j + 1];
95                 arr[j + 1] = temp;
96             }
97         }
98     }
99 }
100 }

```