

```
1 import java.util.Arrays;
2
3 public class App {
4     public static int binarySearch(int[] arr, int input) {
5         int a = 0;
6         int b = arr.length - 1;
7         while (a <= b) {
8             int c = (a + b) / 2;
9             if (arr[c] == input) {
10                 return c;
11             } else if (arr[c] < input) {
12                 a = c + 1;
13             } else {
14                 b = c - 1;
15             }
16         }
17         return -1;
18     }
19
20     public static int linearSearch(int[] arr, int input) {
21         for (int i = 0; i < arr.length; i++) {
22             if (arr[i] == input) {
23                 return i;
24             }
25         }
26         return -1;
27     }
28
29     public static void bubbleSort(int[] arr) {
30         int n = arr.length;
31         for (int i = 0; i < n - 1; i++) {
32             for (int j = 0; j < n - i - 1; j++) {
33                 if (arr[j] > arr[j + 1]) {
34                     int temp = arr[j];
35                     arr[j] = arr[j + 1];
36                     arr[j + 1] = temp;
37                 }
38             }
39         }
40     }
41
42     public static void main(String[] args) {
43         int[] arr = {88, 20, 98, 23, 87, 44, 100, 45, 77, 82, 123, 333};
44         int input = 333;
45         long startTime = System.nanoTime();
46         System.out.println("Unsorted Array: " + Arrays.toString(arr));
47         bubbleSort(arr);
48         System.out.println("Sorted Array: " + Arrays.toString(arr));
49         System.out.println("Binary: " + binarySearch(arr, input));
50         System.out.println("Linear: " + linearSearch(arr, input));
51         long endTime = System.nanoTime();
52         long duration = (endTime - startTime);
53         System.out.println("Execution Time: " + duration + " nanoseconds");
54     }
55 }
56
```