HATFD1025

Find the Second Largest Element in an Array

Write a program to find the second-largest element in an array of integers without using any sorting algorithms or built-in array functions.

Instructions: Traverse the array manually to find both the largest and second-largest elements

```
public class SecondLargestFinder {



  public static int findSecondLargest(int[] arr) {

    if (arr.length < 2) {

      throw new IllegalArgumentException("Array should have at least two elements.");

    }



    // Initialize largest and second largest to minimum possible values

    int largest = Integer.MIN_VALUE;

    int secondLargest = Integer.MIN_VALUE;



    // Traverse the array

    for (int num : arr) {

      if (num > largest) {

        // Update second largest to be the previous largest

        secondLargest = largest;

        // Update largest to the current number

        largest = num;

      } else if (num > secondLargest && num != largest) {

        // Update second largest if current number is between largest and second largest

        secondLargest = num;

      }
```

```
        }

        if (secondLargest == Integer.MIN_VALUE) {
            throw new IllegalArgumentException("There is no second largest element (all elements might be equal).");
        } else {
            return secondLargest;
        }
    }

    public static void main(String[] args) {
        int[] array = {12, 35, 1, 10, 34, 1};
        try {
            System.out.println("The second largest element is: " + findSecondLargest(array));
        } catch (IllegalArgumentException e) {
            System.out.println(e.getMessage());
        }
    }
}
```

OUTPUT:

```
The second largest element is: 34
```