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05: ♦ Finding the 2nd highest number in an array

Posted on March 19, 2015 by Arulkumaran Kumaraswamipillai

Requirements gathering

1. Does the array allow duplicates?
2. If duplicates are allowed, then do you need to report duplicates? For example, in {2,4, 6, 3, 6, 5}, is 6 or 5 the second highest?

Analysis

- If duplicates are not allowed, sort the array (Arrays.sort(…)) and get the second last element, which executes in O(nlogn)
- If duplicates are allowed, loop through each element have two variables to store highest & second highest values. which executes in O(n)

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Solution: duplicates are allowed

```java
public class SecondHighest {

    public static void main(String[] args) {

        int[] numbers =  {2,4, 6, 3, 6, 5};

        int highest = Integer.MIN_VALUE + 1;
        int sec_highest = Integer.MIN_VALUE;

        for (int i : numbers) // b is array of i
        {
            if (i > highest) // new highest foun
            {
                // highest becomes "second highe
                sec_highest = highest; // make c
                highest = i; // make current val
            }
            // "i != highest "is to ensure dupli
            // highest & "second highest"
            else if (i > sec_highest && i != hig
            {
                sec_highest = i;
            }
        }

        System.out.println("sec_highest=" + sec_
    }
}
```

Output:

sec_highest=5

Java 8 way

```java
 package com.java8.examples;

import java.util.Arrays;
import java.util.List;
import java.util.stream.Collectors;

public class SecondHighest {

    public static void main(String[] args) {

        List<Integer> numbers = Arrays.asList(2,
        List<Integer> sortedUniqueNumbers = numb
                .distinct()  // remove duplicates
                .sorted()    // sort
```

```
16              .collect(Collectors.toList()); //
17
18         System.out.println("sec_highest=" +
19              sortedUniqueNumbers.get(sortedUnique
20     }
21 }
22
```

Output:

sec_highest=5

So how about parallelizing the code?

In Java SE 8 it's easy: just replace stream() with **parallelStream()**.

```
1   package com.java8.examples;
2
3  import java.util.Arrays;
4  import java.util.List;
5  import java.util.stream.Collectors;
6
7  public class SecondHighest {
8
9      public static void main(String[] args) {
10
11         List<Integer> numbers = Arrays.asList(2,
12
13         List<Integer> sortedUniqueNumbers = numb
14              .distinct()  // remove duplicates
15              .sorted()    // sort
16              .collect(Collectors.toList()); //
17
18         System.out.println("sec_highest=" +
19              sortedUniqueNumbers.get(sortedUnique
20     }
21 }
22
```

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