2015

CS 1632 – DELIVERABLE 6

FINAL DELIVERABLE – TESTING ARRAY CONCATENATION

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I decided I would perform property-based testing for the final deliverable because I wanted to see if I could find an error in a Java method. I could not find much information about the nature of array concatenation via ArrayUtils.addAll, so I believed I would have my best shot finding an error within it. I tested the following aspects:

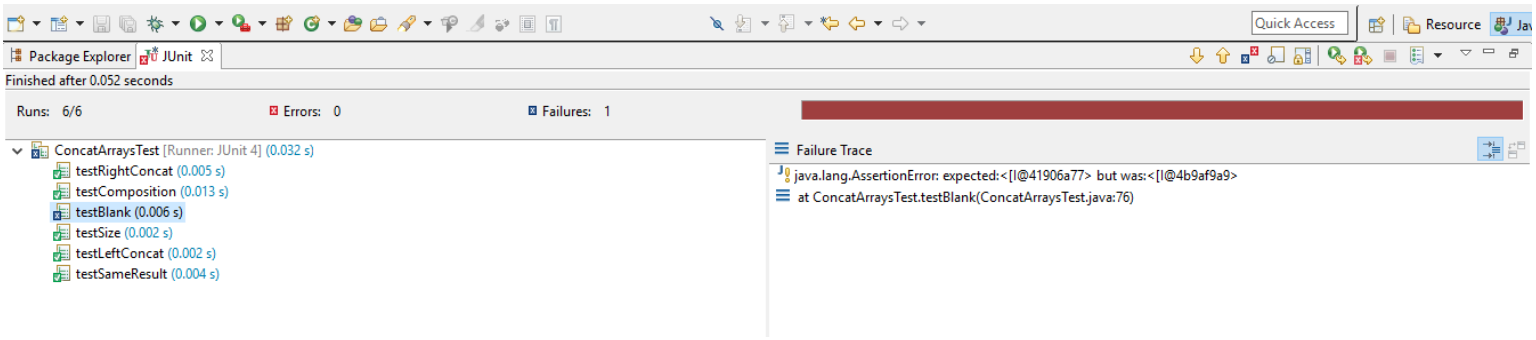
1. Composition: A concatenated array should contain all elements found in the two original arrays
2. Size: A concatenated array should be the same length as the sum of the two original arrays' sizes
3. Blank: An array concatenated with an empty array should produce the same array
4. Left Concatenate: The first n elements (n being the length of the first array) should be found within the first array
5. Right Concatenate: The latter n elements (n being the length of the second array) should be found within the second array
6. Same Result: If two arrays are concatenated twice, the result should be the same both times

To test an appropriate amount of arrays, I created a two-dimensional array, which would contain 100 arrays of varying lengths within it. I decided to cap the length of these arrays at 500, although they could be any length less than 500, as well. Additionally, the maximum value to be contained in any of these arrays was set to 500. The testing itself was fairly straightforward: I iterated through the two-dimensional array and tested each of the six properties on the 100 arrays.

I was able to find an error, at least given my test, for the concatenation of an array with a blank or empty array. To see if I had simply made a mistake, I added a couple print statements to display the length of the original array and the final concatenated array. As I expected, the arrays had the same length every time I ran the test. But the AssertEquals would not pass, comparing the first array to the concatenated one. I do not fully understand why this did not work, but I am sure there is an explanation for it. Despite this, I would not recommend this is used until this behavior can be explained.

GitHub Link: https://github.com/lmk65/CS1632-Deliverable 6

Results


Quick Access
Resource
Package Explorer
JUnit
Finished after 0.052 seconds
Runs: 6/6
Errors: 0
Failures: 1
ConcatArraysTest [Runner: JUnit 4] (0.032 s)
testRightConcat (0.005 s)
testComposition (0.013 s)
testBlank (0.006 s)
testSize (0.002 s)
testLeftConcat (0.002 s)
testSameResult (0.004 s)
Failure Trace
java.lang.AssertionError: expected:<[I@41906a77> but was:<[I@4b9af9a9>
at ConcatArraysTest.testBlank(ConcatArraysTest.java:76)