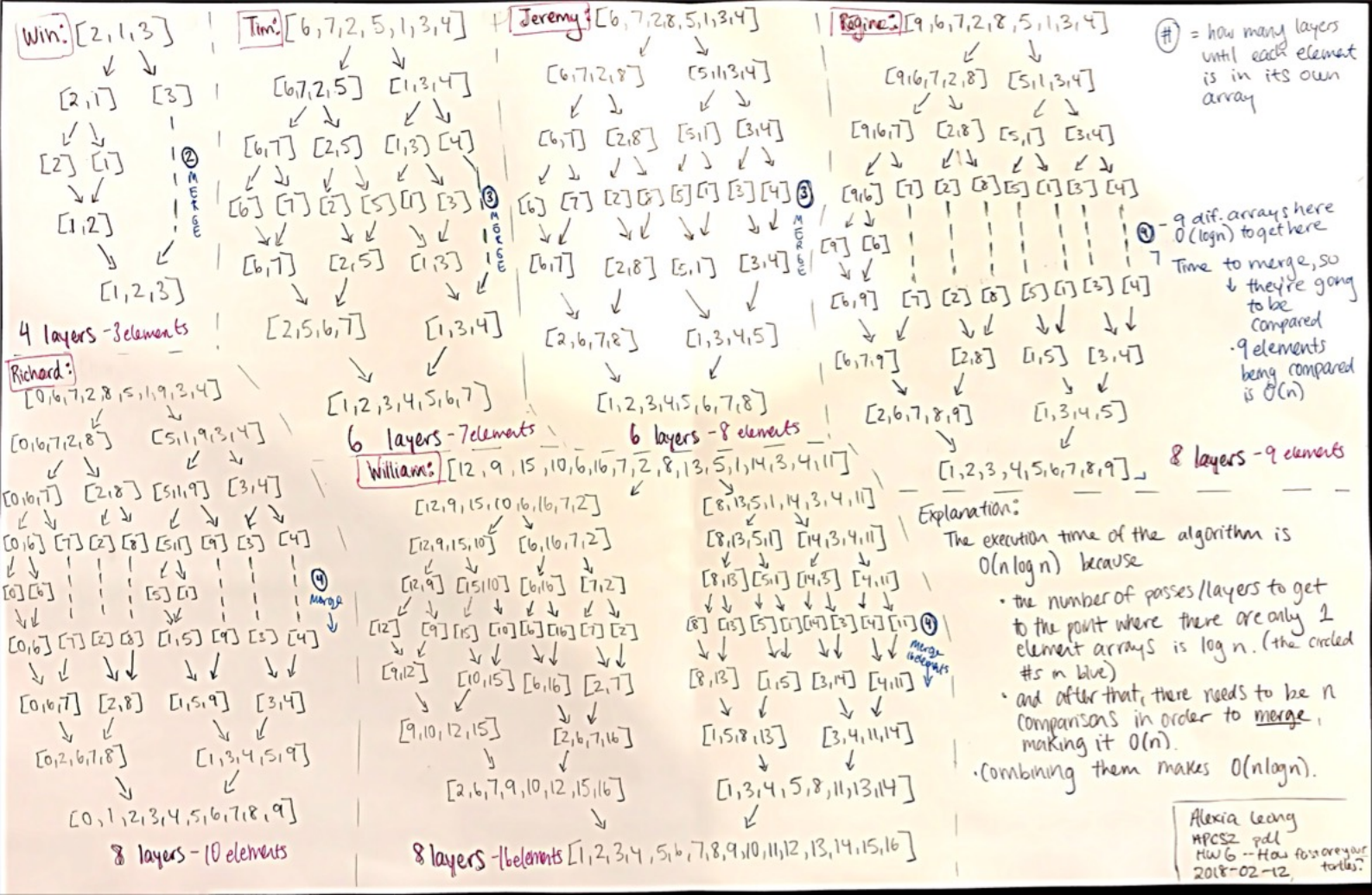
Win: [2,1,3]
[2,1] [3]
[2] [1]
[1,2]
[1,2,3]
② MERGE
4 layers - 3 elements
Tim: [6,7,2,5,1,3,4]
[6,7,2,5] [1,3,4]
[6,7] [2,5] [1,3] [4]
[6] [7] [2] [5] [1] [3]
[6,7] [2,5] [1,3]
[2,5,6,7] [1,3,4]
[1,2,3,4,5,6,7]
③ MERGE
6 layers - 7 elements
Jeremy: [6,7,2,8,5,1,3,4]
[6,7,2,8] [5,1,3,4]
[6,7] [2,8] [5,1] [3,4]
[6] [7] [2] [8] [5] [1] [3] [4]
[6,7] [2,8] [5,1] [3,4]
[2,6,7,8] [1,3,4,5]
[1,2,3,4,5,6,7,8]
③ MERGE
6 layers - 8 elements
Regine: [9,6,7,2,8,5,1,3,4]
[9,6,7,2,8] [5,1,3,4]
[9,6,7] [2,8] [5,1] [3,4]
[9,6] [7] [2] [8] [5] [1] [3] [4]
[9] [6]
[6,9] [7] [2] [8] [5] [1] [3] [4]
[6,7,9] [2,8] [1,5] [3,4]
[2,6,7,8,9] [1,3,4,5]
[1,2,3,4,5,6,7,8,9]
⑨ - 9 dif. arrays here O(log n) to get here
Time to merge, so they're going to be compared
· 9 elements being compared is O(n)
8 layers - 9 elements
= how many layers until each element is in its own array
Richard: [0,6,7,2,8,5,1,9,3,4]
[0,6,7,2,8] [5,1,9,3,4]
[0,6,7] [2,8] [5,1,9] [3,4]
[0,6] [7] [2] [8] [5,1] [9] [3] [4]
[0] [6] [5] [1]
[0,6] [7] [2] [8] [1,5] [9] [3] [4]
[0,6,7] [2,8] [1,5,9] [3,4]
[0,2,6,7,8] [1,3,4,5,9]
[0,1,2,3,4,5,6,7,8,9]
④ MERGE
8 layers - 10 elements
William: [12,9,15,10,6,16,7,2,8,13,5,1,14,3,4,11]
[12,9,15,10,6,16,7,2] [8,13,5,1,14,3,4,11]
[12,9,15,10] [6,16,7,2] [8,13,5,11] [14,3,4,11]
[12,9] [15,10] [6,16] [7,2] [8,13] [5,11] [14,3] [4,11]
[12] [9] [15] [10] [6] [16] [7] [2] [8] [13] [5] [1] [14] [3] [4] [11]
[9,12] [10,15] [6,16] [2,7] [8,13] [1,5] [3,14] [4,11]
[9,10,12,15] [2,6,7,16] [1,5,8,13] [3,4,11,14]
[2,6,7,9,10,12,15,16] [1,3,4,5,8,11,13,14]
[1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16]
④ MERGE
8 layers - 16 elements
Explanation:
The execution time of the algorithm is O(n log n) because
• the number of passes/layers to get to the point where there are only 1 element arrays is log n. (the circled #s in blue)
• and after that, there needs to be n comparisons in order to merge, making it O(n).
· Combining them makes O(n log n).
Alexia Leong
HPCS2 pd1
HW6 -- How fast are your turtles?
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