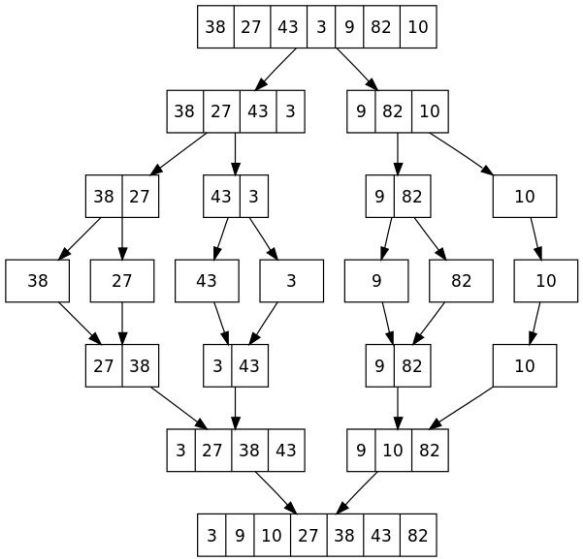
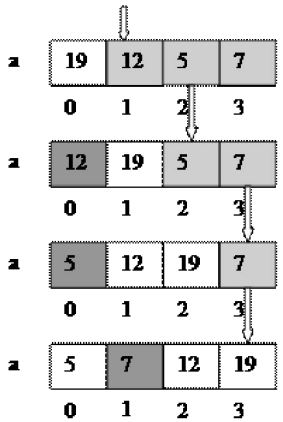
Sorting Competition
CSci 3501, Fall 2016

Group 4: Zach Litzinger & Kyle Hakala

Sorting: a love story across the divide

- Merge sort was used until the array was at most length 8.
- Then, we used insertion sort to finish the job!
- Sorting was performed over double arrays. (`int[][]`)





Big-theta and Memory Usage

Worst case is still Merge Sort's Big-theta.

Big-theta of Merge Sort: n•log(n)

Cut off for merge sort is a list of length 8, then insertion sort starts.

Big-theta of Insertion Sort: n

Only on a nearly sorted list

Memory usage:

Uses 2n at any one time because pizza.

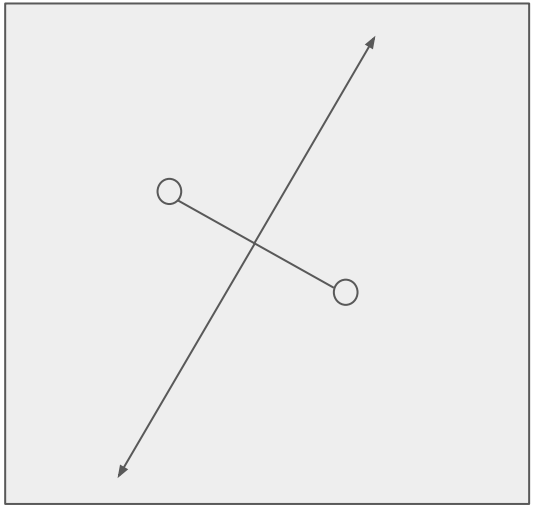
(n + n/2 + n/4 + …)

Constants: We traversed the data set once.

Attempted Avenues for Optimizing

- Attempted to split data points to be on one side of a dividing line perpendicular to the line connecting the two original points (see figure).
  - ➡ This ensured needing only one square root calculation per pair of points.
  - ➡ Problematic when the original points weren't in an order we expected.

- Looked into potential optimizations on square root.
  - ➡ JVM is very efficient on large data sets
  - ➡ Java square root is plenty sufficient



Correctness

We got 8th place. 🐙

No concerns were found with regard to the correctness.

(Thank you again to Dan Woeste!)

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… We agree!