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CS 2420

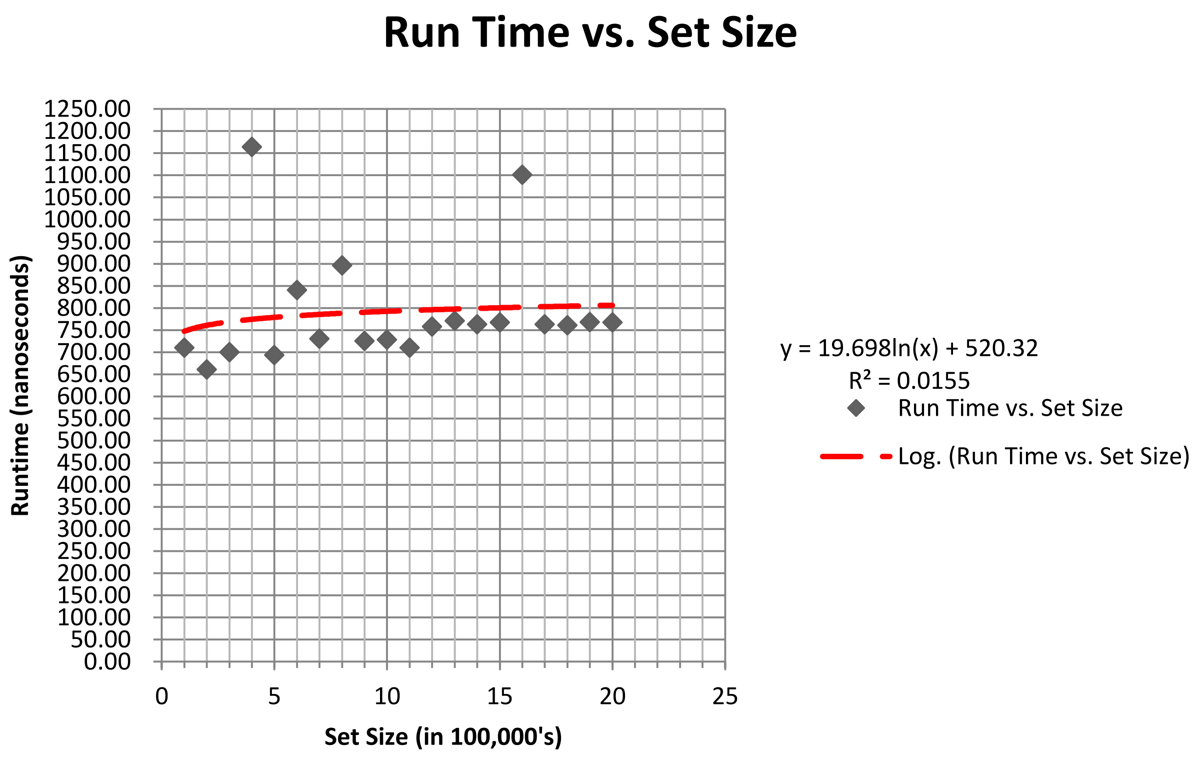
1. My programming partner is Jackson Murphy. He submitted the source code for this program.

2. I'd say we'd switch roles about every 15-20 minutes. I think this was a comfortable amount of switching. It seemed like it would just happen naturally. Maybe switching a bit more would be good. This would force us to change perspectives more frequently and look at the code from a different angle.

3. Jackson Murphy is a great programmer. I would rate my experience with him 5 stars. Would do again. I'll more than likely be with him for the next assignment as well.

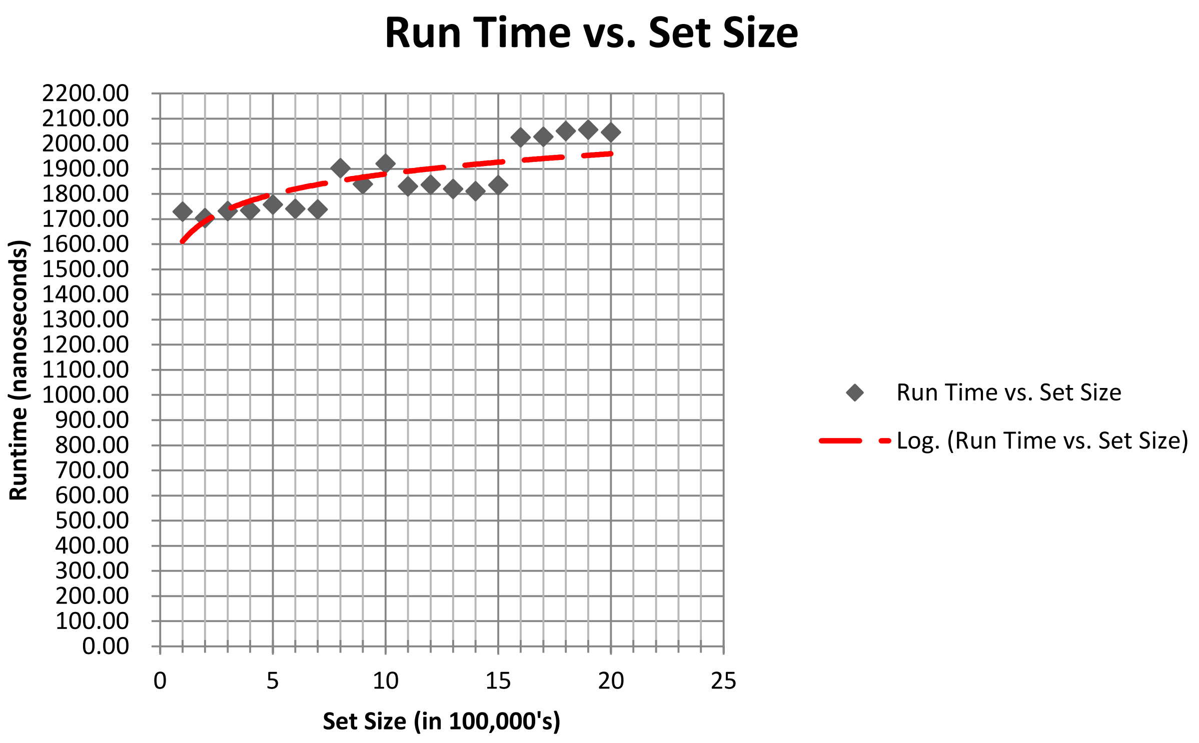
4. Arrays are fixed size, which means we can increment the size in a way that suits what we're doing. It's often very efficient to start off at a reasonable number and then double it every time its size needs to increase. I believe the List class auto-increments its size, which means that every time you add something to the list, it will take up some memory to create a new list and it'll have to copy N elements over. However, with the incrementing we did for this assignment, there is a disadvantage in that you can be taking up a lot of space with arrays whose cells are empty. At a glance I guess it sounds like it would take less time to use lists, though. Indexing is the same and if we don't have to worry about adjusting the size, the methods we wrote seem like they would be more straightforward. For instance, when we add something to a list, the elements at or beyond the insertion point are automatically shifted and the size variable is incremented for us.

5. I would expect it to be around O(LogN). The reason for this is that the only thing this method does that relies on N is the binary search algorithm. This algorithm is of order O(LogN) because of the repeated halving principle.



6. Though the line calculated by Excel doesn't inspire much confidence, one can see a general trend in the data points. They are gradually increasing in size. If this were linear or quadratic, it would definitely not look this way. I can only conclude that it is O(Log N)

7. Locating the correct position should be the same amount of work that the contains method takes. That alone would be O(Log N). In the worst case, the add method would have to shift N elements over to add the new entry in the first cell. The worst case would be O((N + Log N)) which is just O(N). The plot below takes way more time because I had it shift a ton of elements over every time.



8. We spent about 6 hours on this assignment.