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Introduction to Algorithms
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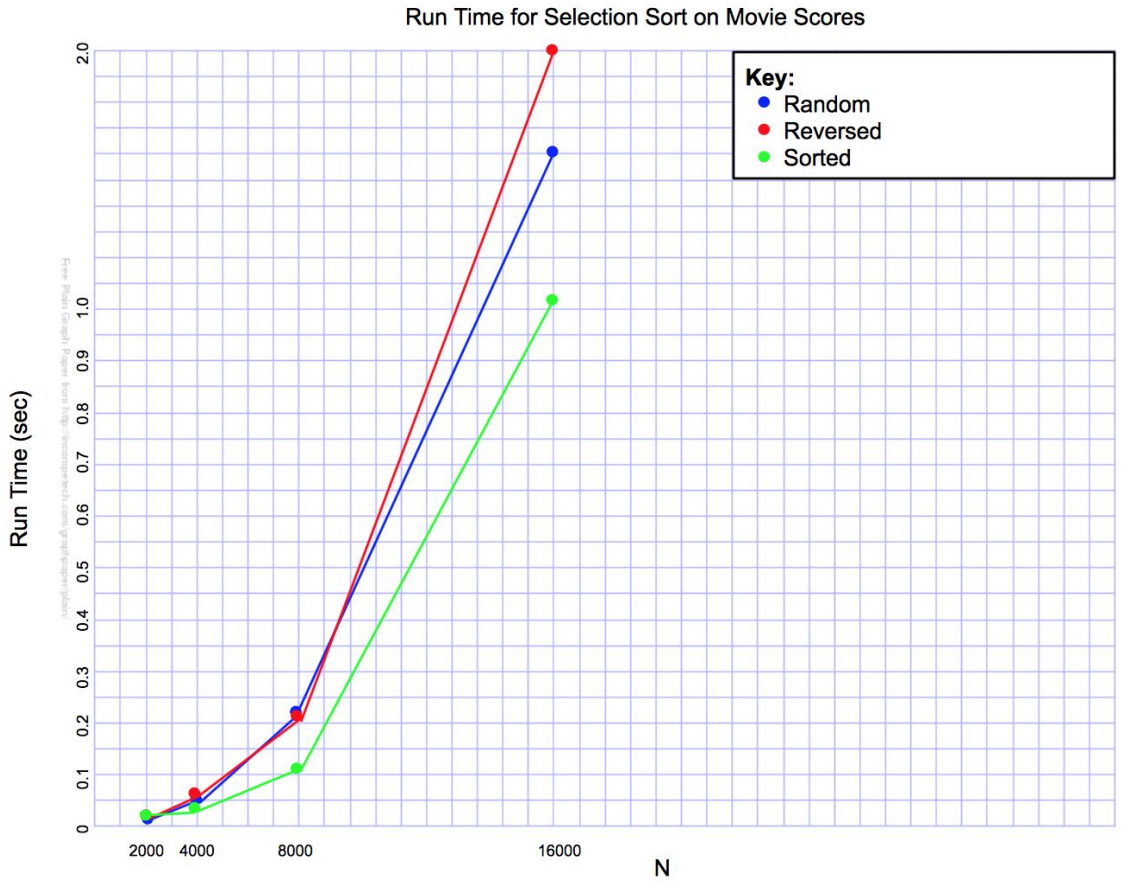
Week 4 Workshop

1. See java files in branch.
2. **movie_title_score.random.csv:**
   - **2000**: 0.026, 0.02, 0.022 -> Average runtime is **0.023**
   - **4000**: 0.052, 0.049, 0.051 -> Average runtime is **0.051**
   - **8000**: 0.212, 0.225, 0.237 -> Average runtime is **0.225**
   - **16000**: 1.216, 1.888, 1.861 -> Average runtime is **1.655**

   movie_title_score.reversed.csv:
   - **2000**: 0.022, 0.023, 0.03 -> Average runtime is **0.025**
   - **4000**: 0.057, 0.066, 0.057 -> Average runtime is **0.06**
   - **8000**: 0.21, 0.212, 0.232 -> Average runtime is **0.218**
   - **16000**: 1.697, 2.737, 1.572 -> Average runtime is **2.002**

   movie_title_score.sorted.csv:
   - **2000**: 0.031, 0.023, 0.02 -> Average runtime is **0.0247**
   - **4000**: 0.041, 0.034, 0.037 -> Average runtime is **0.0373**
   - **8000**: 0.121, 0.137, 0.128 -> Average runtime is **0.129**
   - **16000**: 1.57, 0.938, 1.39 -> Average runtime is **1.299**



3. Using the doubling rule, when the input doubles, SelectionSort's runtime also doubles. Therefore, the growth of SelectionSort is linear.
4. In the SelectionSort code, there are two array accesses. When an array access occurs, the cost is ~ n. So, the cost model for this algorithm would be ~ n^2.
5. Looking at the code for SelectionSort, I do not think that the order of the inputs make much of a difference on efficiency of the algorithm because the **exch** method is called outside of one of the for loops and the **less** method is inside of an if statement. Due to the location of these methods, the algorithm will output a sorted list in about the same time as one another.