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CSCI 271

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Project 4 Report

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| --- | --- | --- | --- | --- |
| Table Size | Time for Bubble Sort (seconds) | Time for Quick Sort (seconds) | Time for Insertion Sort (seconds) | Time for Merge Sort (seconds) |
| 2,000 | 0.028 | 0.008 | 0.016 | 0.008 |
| 4,000 | 0.116 | 0.016 | 0.060 | 0.016 |
| 10,000 | 0.812 | 0.036 | 0.322 | 0.032 |
| 20,000 | 3.068 | 0.064 | 1.380 | 0.064 |
| 50,000 | 19.744 | 0.184 | 9.068 | 0.188 |
| 100,000 | 81.412 | 0.328 | 37.460 | 0.354 |
| 1,000,000 | 2,500 | 3.504 | 1,500 | 3.630 |
| 10,000,000 | 25,000 | 40.100 | 15,000 | 48.416 |

Prediction

I predict it will take about 2,500 seconds to sort an array of size one million and about 25,000 seconds for an array of ten million using the bubble sort. For the insertion sort I predict the time to sort an array of size one million is 1,500 seconds and 15,000 seconds for size ten million. I arrived at this conclusion because the time it takes to sort size twenty thousand is about four times the amount of time it takes to sort size ten thousand. Each time there is an increase by a power of two it will be four times the amount of time, this is because the algorithm is O(n^2).