Jonathan Tice

Professor Thacker

CSCI 271

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| Input Size | Time for insertion Sort (seconds) | Time for merge Sort (seconds) |
| 2,000 | 0.024 | 0.000 |
| 4,000 | 0.036 | 0.004 |
| 10,000 | 0.232 | 0.008 |
| 20,000 | 0.956 | 0.016 |
| 50,000 | 6.408 | 0.052 |
| 100,00 | 26.560 | 0.104 |
| 1,000,000 | ----------------------------------- | 1.176 |
| 10,000,000 | ----------------------------------- | 14.024 |

Project 4 Report

Prediction

I predict it will take about 1,062.4 seconds to sort an array of size one million and about 42,496 seconds for an array of ten million using the insertion sort. 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 ten it will be four times the amount of time, this is because the algorithm is O(n^2). So, to get from one hundred thousand to ten million is ten times what it would take to get the time for an increase of ten thousand. I multiplied forty by the time it would take to sort an input of size one hundred thousand to get the time it would take for an input size of one million and multiplied that by forty to get the time for size ten million.