**SYSC 3303 Winter 2021 Project**

**Group 1**

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**Iteration 5 – Measuring the Scheduler and predicting the performance**

**Formulas Used:**

The formula used to calculate the average:

The formula used to calculate the standard deviation:

is the mean of the data.

is the corresponding data value for test 1-10.

will give the deviation, which are squared to make all positive when added together.

Where N is the total number of data values.

is the standard deviation.

To calculate the confidence interval, we use the following formula:

Calculating confidence interval, we use a Z value of 1.960. This corresponds to 95% confidence.

is the mean of the data.

is the standard deviation.

is the number of observations.

**Measurements:**

The system is comprised of 4 elevators and 22 floors. For these measurements, the elevator movement between floors was set to 500ms and the passenger load time (door open/close time) was set to 1000ms. Events.txt contains 4 input lines that move the 4 elevators between floors 1-5 while mainEvents2.txt contains 16 input lines that move the 4 elevators between floors 1-22. Events.txt contains no faults while mainEvents2.txt contains a type 1 fault (door stuck).

|  |  |  |  |
| --- | --- | --- | --- |
| Test Number | events.txt (ns) | mainEvents2.txt (ns) | mainEvents.txt (ns) |
| 1 | 32010836626 | 140428821898 | 150321230036 |
| 2 | 34437933863 | 133309005502 | 151451413558 |
| 3 | 30487318524 | 128131137230 | 109230807014 |
| 4 | 33388084648 | 138141341532 | 129230203043 |
| 5 | 29797513682 | 145709396968 | 155369549049 |
| 6 | 34468268867 | 119236569903 | 143966260937 |
| 7 | 30360619671 | 121625680933 | 121843350232 |
| 8 | 33029461999 | 135874869586 | 143367433947 |
| 9 | 30710795355 | 135783241026 | 124746275303 |
| 10 | 31178499474 | 110763242396 | 96200175548 |

**events.txt results:**

**mainEvents2.txt results:**

**mainEvents.txt results:**

**Conclusions:**

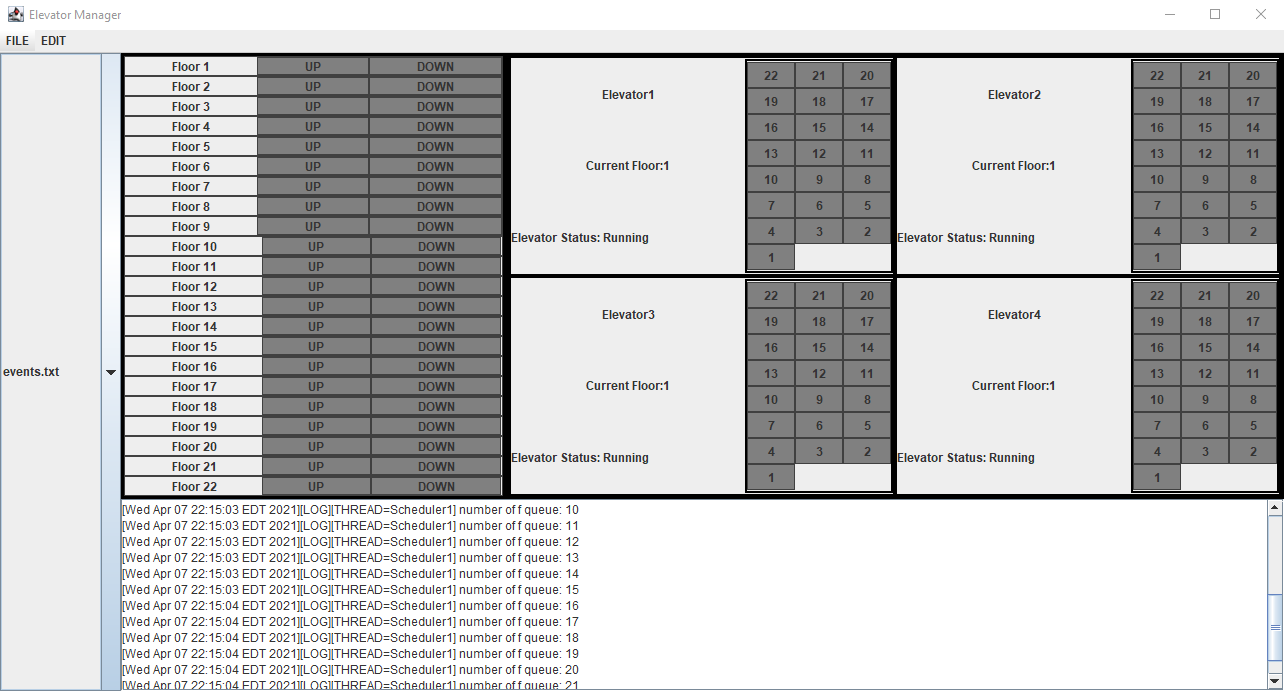
When an elevator experiences a type 2 fault it changes the time to execute as the remaining elevators are required to fulfill the requests by the downed elevator. If the elevator fault occurs early, more time is spent with only 3 elevators fulfilling requests which leads to a longer execution time. The number of door faults included in the input file will increase the total execution time. If there are input lines that move between a high number of floors, there will be a greater delay over time due to the greater distance across floors. The larger distance between floors that an elevator travels will result in a longer time for the elevator to reach its destination. Increasing either of the load times or elevator movement times will result in a higher execution time due to latency for those events. Decreasing either of those times will have an opposite effect decreasing the scheduler processing time.

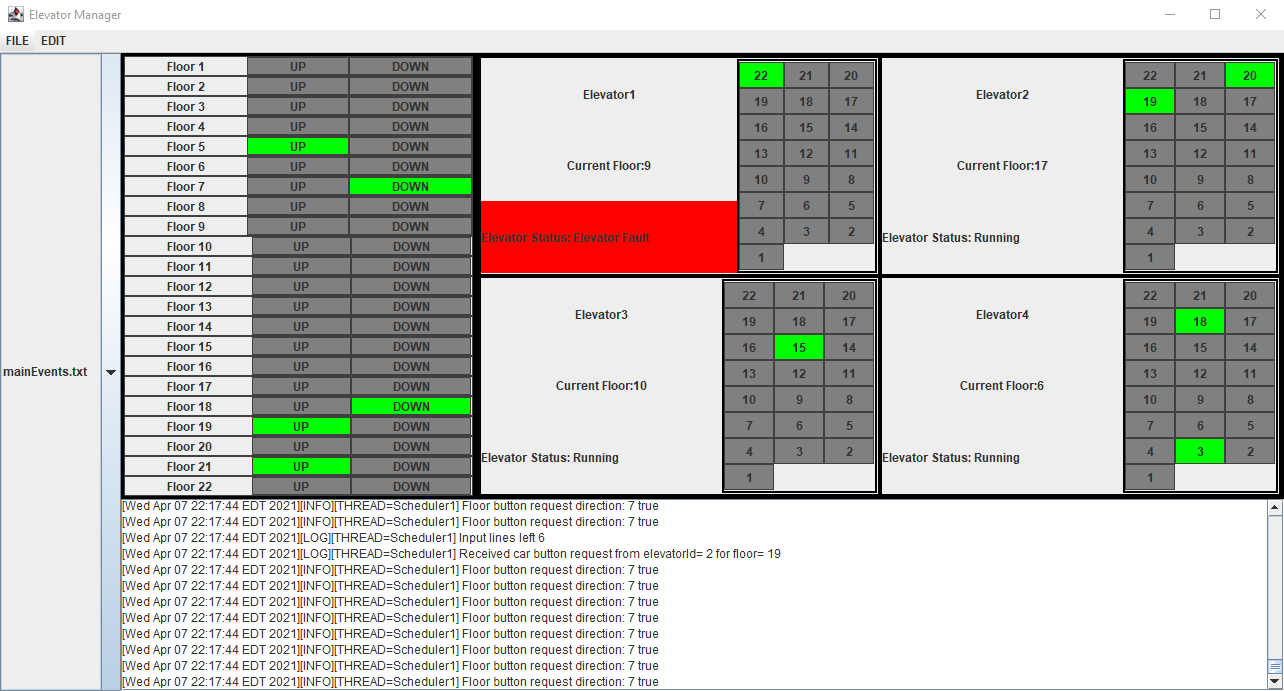
**Reflections**

Enjoyments: GUI,

Improvements: Code linter, conforming to a standard document,

**Appendix**

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