Project 1 – Percolation

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Analysis

For the analysis part of this project, I ran PercolationStats with the arguments of N = {10, 25, 50, 100, 250, 500} and T = 30. For the data I took the average value of all the trials for each grid size and used that to plot/chart.

	n	10	25	50	100	250	500
fast	**avg p***	0.5853	0.586613	0.596693	0.591403	0.593353	0.59432
	avg time (s)	1.67E-04	4.00E-04	7.67E-04	2.07E-03	5.67E-03	2.25E-02
slow	**avg p***	0.598	0.596853	0.590506	0.598546	0.591762	0.593314
	avg time (s)	2.00E-04	3.67E-04	8.33E-04	1.80E-03	1.11E-02	9.10E-02

Graph of execution time
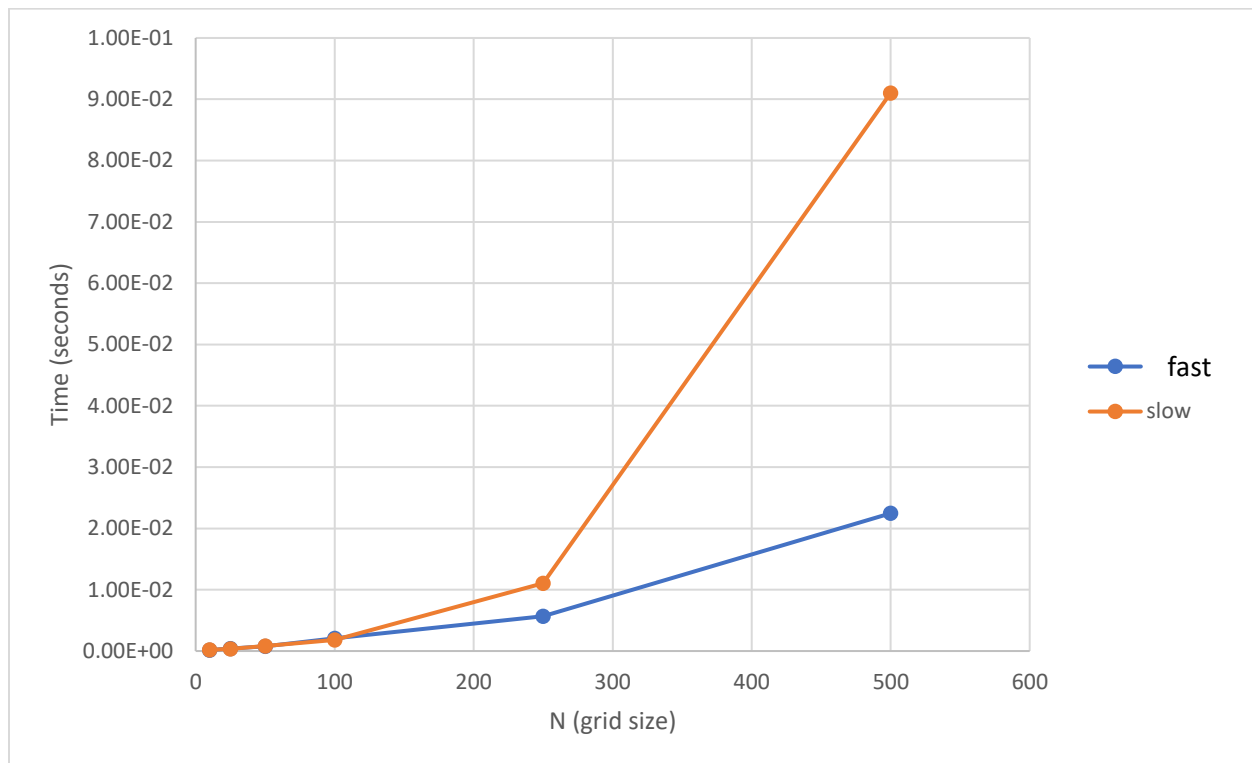
Graph of P* value
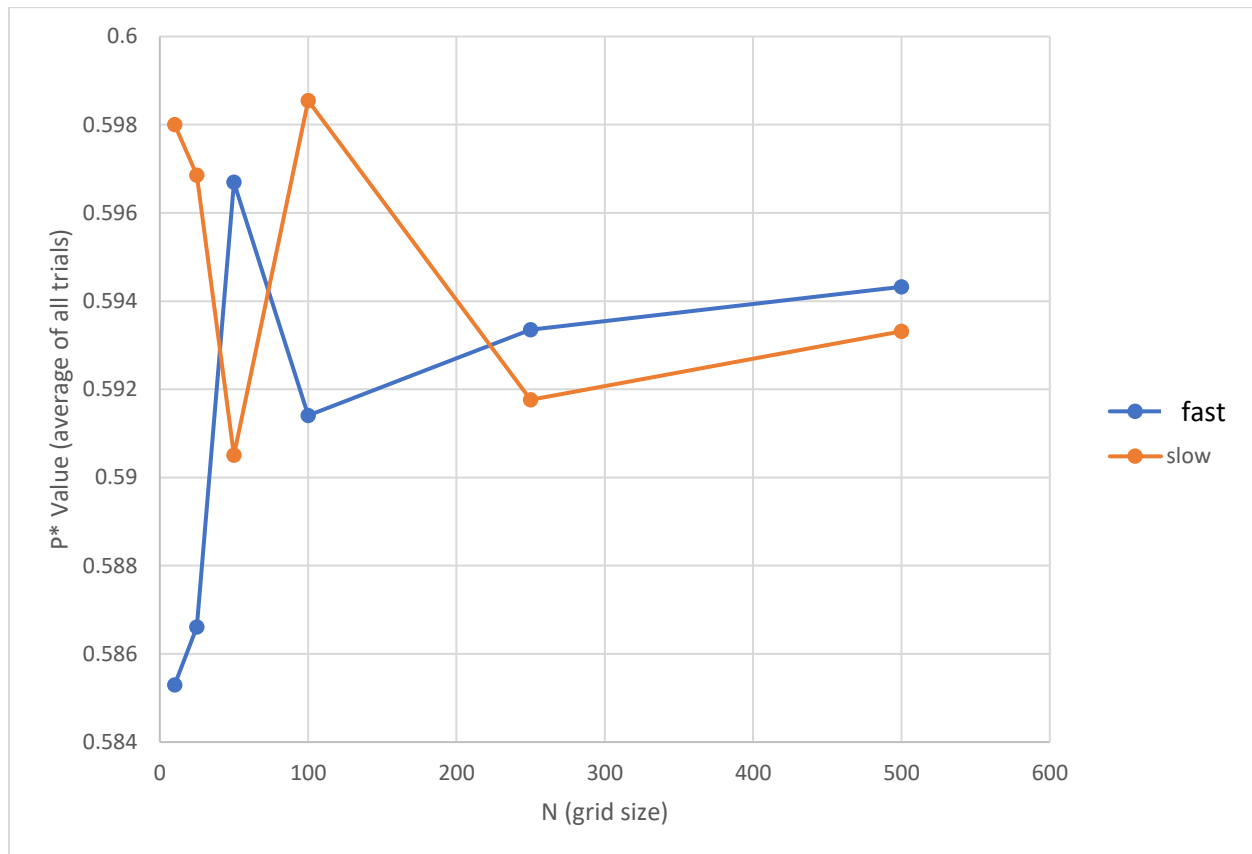
Conclusion

After performing the analysis and analysis the data (as seen above in the graphs) I have made a conclusion on both the p* value and the execution time.

For the execution time, I can conclude that the QuickUnionFindUF is slower than the WeightedQuickUnionFindUF. This is demonstrated in the graphs above and visually when executing the code. This is especially obvious as the grid size increases, where N > 250 it starts to make a very noticeable difference on time execution between these two methods.

For the p* value I feel I can conclude that it is generally the same value for all grid sizes, however as the grid size increases the values become even more similar. Although there appears to be spikes within the graph in the beginning these values are very small in change (around 0.59 overall) and thus we can conclude the average probability p* value is around 0.59 regardless of grid size.