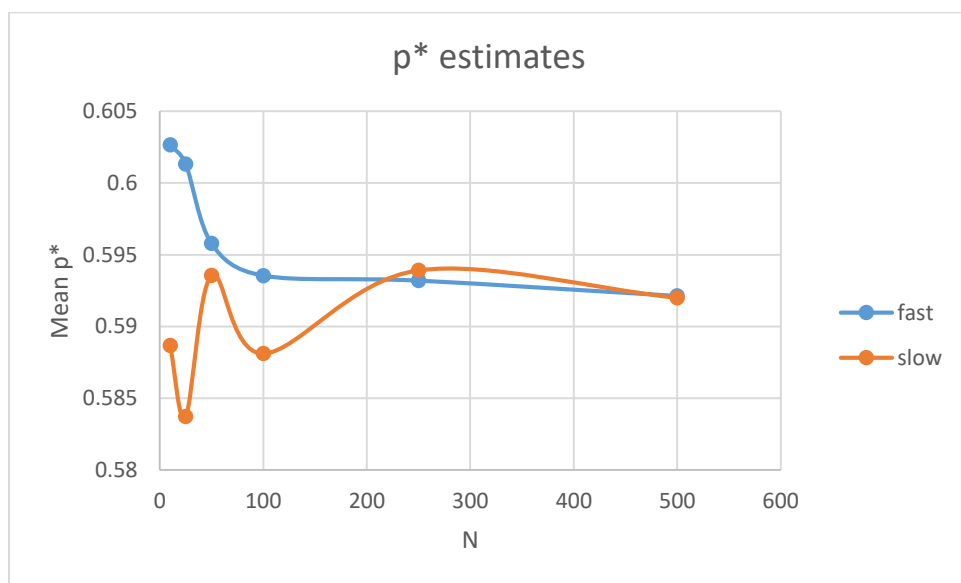Elijah Hauber

CS 251

Section: LE1

Tricoche, Xavier
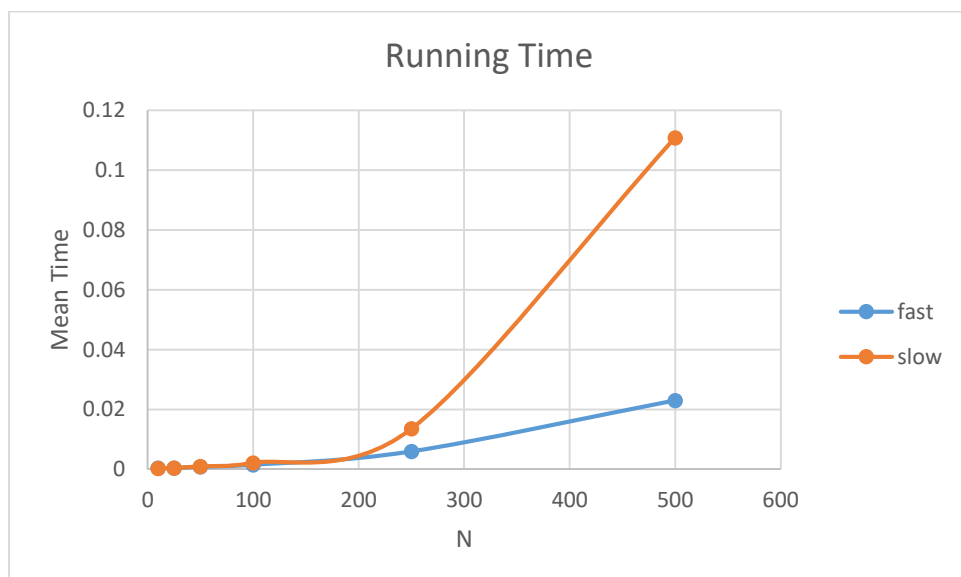
Project 1: Percolation Analysis

Plots:

p* estimate plot:

Running time plot:

Questions:

What differences can be found in terms of execution time?

There is a significant difference between the weighted quick-union algorithm (fast) and the unweighted quick-union algorithm (slow). The unweighted quick-union has an order that corresponds to its tree height and the weighted has an order that is lg N. Since the weighted quick-union has a better order of growth typically the time for this algorithm will be faster.

What is the behavior of the estimates of p*?

The behavior of p* is widely disparate for small values of N but as N gets larger the graph looks like it is bounded by the horizontal line at .5925. If the number of iterations were increased it may be closer to .6 but from the data this is the behavior of p* from the data collected.

Data Collected:

fast		slow			N	T
Mean p*	Mean time	Mean p*	Mean time			
0.602667	0.00033333	0.58866667	0.00023333		10	30
0.601333	0.00033333	0.58373333	0.0004		25	30
0.595787	0.00076667	0.59356	0.00093333		50	30
0.593547	0.00143333	0.58811667	0.0021		100	30
0.593198	0.0059	0.59391253	0.0135		250	30
0.592129	0.023	0.59199907	0.11086667		500	30