EECS 560: Lab 11 Report

Seed	n	Time	Cost
1	1000	0.01807	10511
2	1000	0.017096	10460
3	1000	0.016815	10539
4	1000	0.01651	10014
5	1000	0.017107	9567
Average		0.0171196	10218.2
6	2000	0.062807	20239
7	2000	0.062303	20023
8	2000	0.063031	19733
9	2000	0.06051	20286
10	2000	0.063122	20274
Average		0.0623546	20111
11	4000	0.22557	40676
12	4000	0.226436	40381
13	4000	0.230463	40260
14	4000	0.224306	39695
15	4000	0.231967	40081
Average		0.2277484	40218.6
16	8000	0.883006	80223
17	8000	0.871752	81942
18	8000	0.865514	80376
19	8000	0.865914	81332
20	8000	0.879368	81836
Average		0.8731108	81141.8

Kruskal's MST
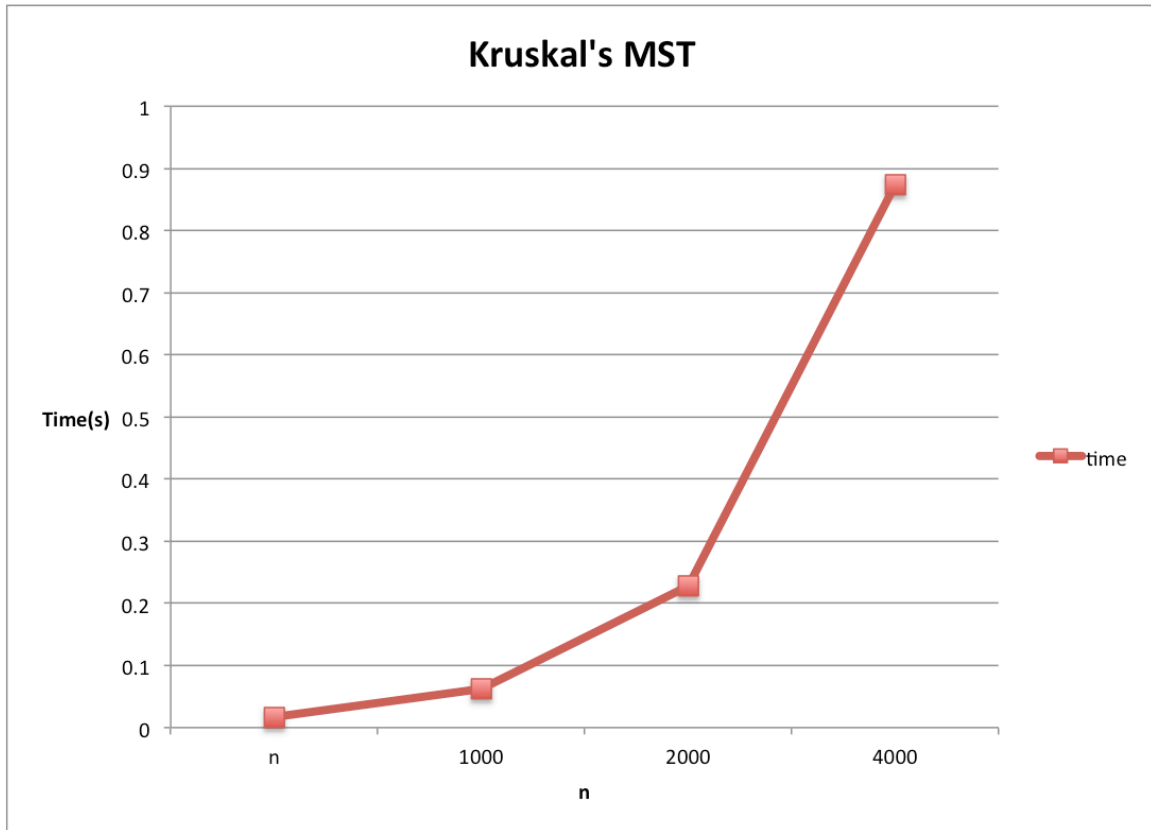
For this lab, I had much trouble getting prim's algorithm to work correctly. It would solve the graph and the resulting cost of the MST would be the same for both algorithms, however prim's would take over 400 seconds to solve a graph with n =1000.

After observing the performance of Kruskal's algorithm, I can make a few observations. My implantation uses the union by rank, as well as path compression heuristics for the disjoint set data structure. If my implementation was different, I think the performance of the algorithm would be significantly affected. When using union by rank and path compression, the big O complexity follows the inverse ackermann's function. The times are pretty consistent for the different seeds across a value of n.