**Project Conclusions**

As can be seen in the above figures, both tree structures performed far better than having no index structure at all. The difference is quite large, with the tree structures having about 1/1000 the time elapsed as opposed to no index structure. However, one disappointment was that my kd-tree modifications did not result in a large change in time. My difference was that I modified the kd-tree nodes to split horizontally or vertically depending on whether the x values had a larger range or the y values did. But, as can be seen by the results, this change only amounted to some slight variation and not any actual benefit. Overall, I will say that it is very advantageous to have an index structure which admittedly was expected.