Experiment 1

The more nodes P2 had, the more it won. There was a positive linear relationship between the variables.

Experiment 2

The heuristic added to rollout was made to predict 3 in a row from the opponent and filling in 3 in a row from the player. Our modified heuristic did not win more games against rollout\_bot. It in fact lost more. It won only 35% of the time against it with a tree size of 100. When the tree size was decreased to 200, the win rate dropped to only 17%. This might be due to the fact that even though the rollout is choosing the best action, the UCT does not follow through on that.

Experiment 3

When using the 1 sec as a time constraint, the mcts\_vanilla tree size started off around 1100 nodes at the first iteration and continued to increase to about 4000 -9000 nodes when completed. The mcts\_modified had a much lower starting point for the nodes which was starting at around 140 nodes and increased to around 1000 nodes. We expected this of our modified because the heuristic that we implemented takes a lot of time and it would not be able to get as many nodes in as vanilla due to this.

We tested a change in the time limit by lowering it; when we lowered the time limit to 0.1 seconds the results just scaled down for the two bots (vanilla and modified). The vanilla bot went from starting at 1100 nodes to starting around 150 and the modified went from 140 to around 16 nodes.