Design document:

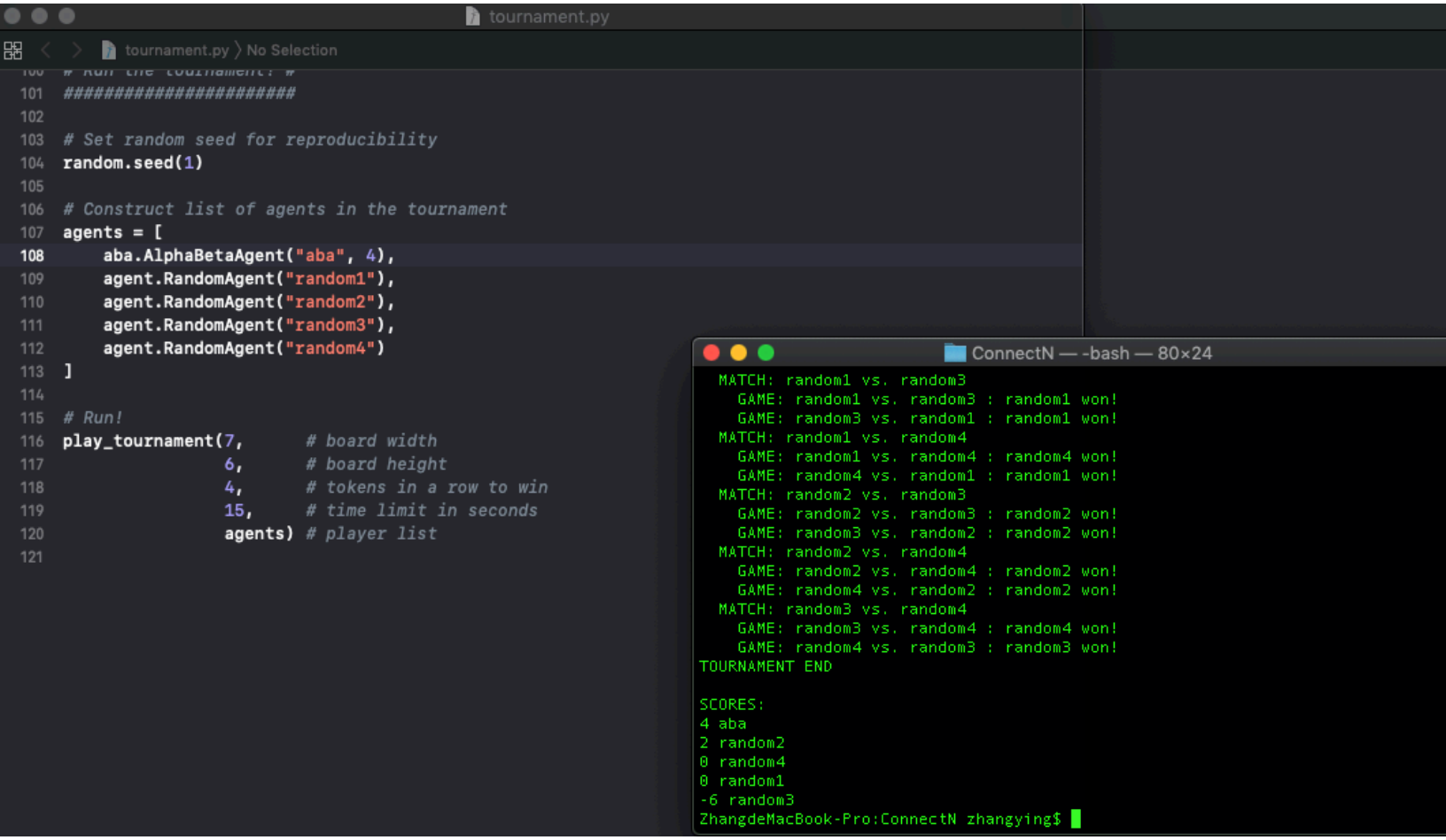
Several heuristics were tried based on what planed in hw2:

1. Maximize the number of 2, 3 and 4 streaks in a row, for losing boards assigns a large negative value.
2. Limits the range of next move. Check for the closes seven positions, assign score for those with potential win. (planned in hw2)
3. Anticipate direct losing moves and block the direct wining moves of opponent, assigns a large negative value for losing boards.

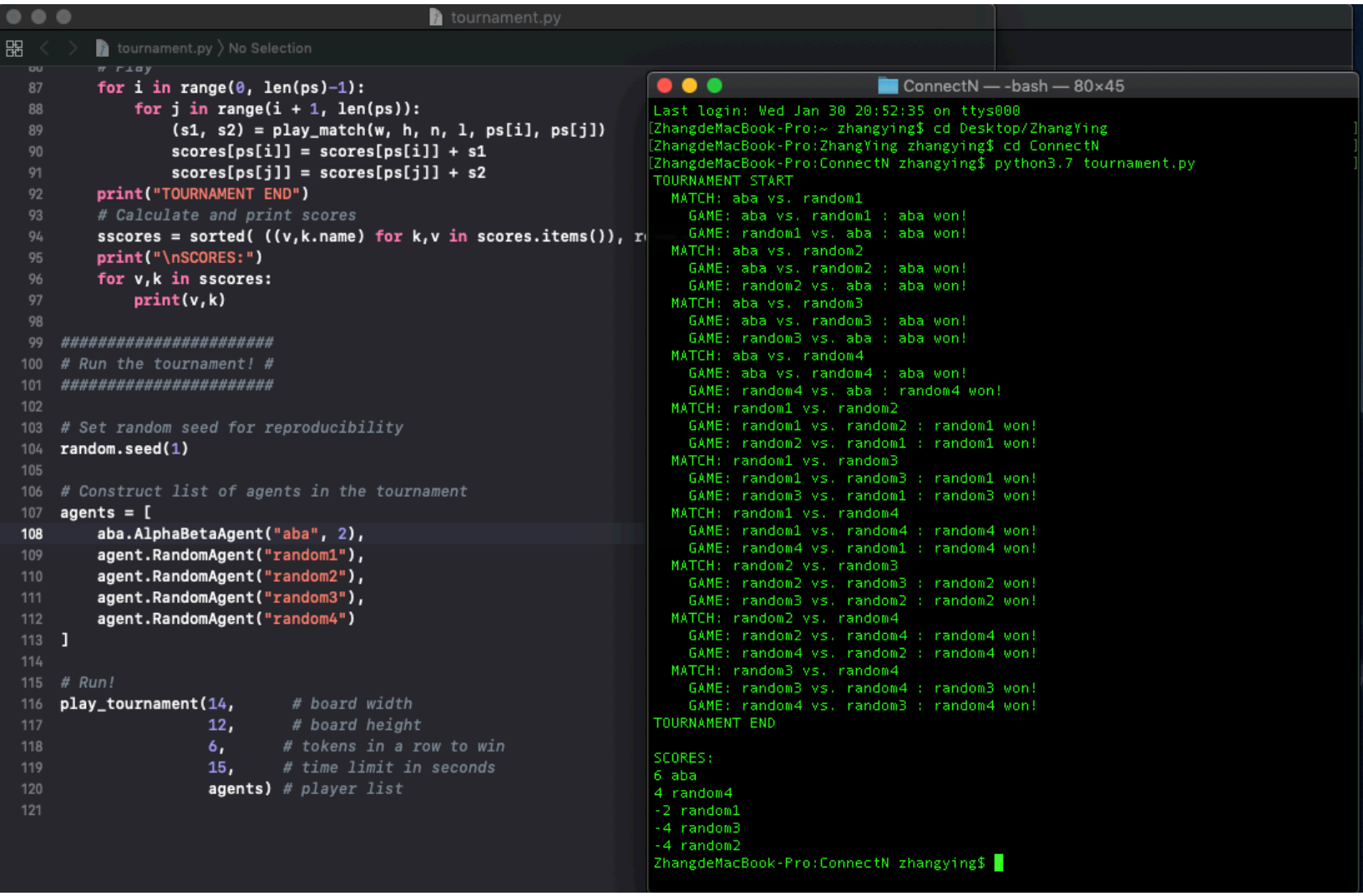
The agent was tested with different depth: 2,4,6,8,10

It turns out more depth led to better performance(takes longer time) and combines of offense and defense heuristics works better.

For a 7* 6 board, I use a depth of 4, which generate following result



For 14*12 board, use a depth of 2, which take about 5 minutes to generate following result



From the above result(2 lose for small board, 1 lose for large board), the heuristics I currently have are obviously not enough. For future improvement I'd like to increase depth for better performance with optimized heuristics. And I certain need more testing on human vs bot to better measure performance and spot weaknesses .