**Udacity – Artificial Intelligence Nanodegree Program**

**Project:** Build a Game Playing Agent

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For this project, a game player agent was developed to play knights isolation. The purpose was to explore adversarial search techniques and implement one of three options:

* **Option 1: Develop a custom heuristic (must not be one of the heuristics from lectures, and cannot only be a combination of the number of liberties available to each agent)**
* **Option 2: Develop an opening book (must span at least depth 4 of the search tree)**
* **Option 3: Build an agent using advanced search techniques (for example: killer heuristic, principle variation search (not in lecture), or monte carlo tree search (not in lecture))**

The following sections of this report are organized first by outlining the option implemented for the project by presenting the performance of the agent against a baseline.

**Section 1. Implementation of an Advanced Search Technique**

Through research, **MTD(f)** (Memory-enhanced Test Driver using first guess) was the algorithms chosen as an advanced search technique. The baseline agent was an alpha-beta pruning search as developed in class with minor performance improvements.

For performance analysis, 100 matches were run with the baseline and the advanced search agent. Fair matches **were not enabled** as they would not have a significant impact given the agent always selects a random move at first.

**Section 2. Performance of MTD(f) vs. Baseline**

Performance comparison

Conclusion

* More/less effective?
* How much performance difference does your agent show compared to the baseline?
* Why do you think the technique you chose was more (or less) effective than the baseline?