Assignment 5: Project Milestone Report

Major Changes:

There have been no major changes in the goals or implementation of our project since the proposal.

What You Have Accomplished So Far:

So far, we have implemented the *structure* of the system that can solve optimal strategies and expected payoffs for any Conquest- or Last Hero Standing-like format. Specifically, the system right now can generate the entire possible match tree, and propagate expected payoffs upwards. In order to complete the system so it can fully solve optimal strategies and expected payoffs, what we have left is to implement an n x m game solver, and generate protect/ban vertices.

Meeting Your Milestone:

We did not meet the milestone described in our original project proposal. My literature review & summary was not particularly thorough, as we discovered earlier this week after finding prior literature with a particularly helpful step-by-step algorithm for solving an n by m game. Things also brings us the second part of the original milestone, which was to develop code to analyze a single n by n game. This was a flawed goal in the first place because we neglected the fact that a more general n by m solver will be needed for nodes in the match tree with an unequal number decks remaining for each player. We have not yet implemented this code, but did find the algorithm noted above. Finally, we did not develop an analysis tool for a single match format, but instead started on the generalized tool for any match format. Thus, although we failed to meet several of our initial goals, we did make more progress than expected on some of our later goals.

Surprises:

As described above, we realized late in the semester that we needed an n by m solver, but we have started to work around this by finding an algorithm in prior literature.

Resources Needed:

The only additional resource we have discussed is access to meta deck winrate statistics, so that our qualitative results can be supported by data from real-world contexts, and our tools can be used for real-world application.

Revisions to your 15-400 Milestones:

Revised bi-weekly Milestones for 15-400

January 27th:
- Implement the *n* x *m* game solver.
- Integrate it into the current match tree structure.
- Write and run test cases to verify correctness.

February 10th:
- Design and implement a measurement scheme for one desirable quality.
- Use this scheme to collect a small dataset on at least 2 different formats.

February 24th:
- Design and implement two more measurement schemes for desirable qualities.
- Integrate some form of data ingestion for real-world decklist winrate data.

March 16th:
- Implement a command-line tool to streamline data generation and analysis.
- Collect and analyze data for each match format, across all measurable qualities.
  - Draw conclusions and build understanding based on the results.

March 30th:
- Develop a web interface for this tool.
- Expand our study into tournament deck selection strategies.
  - Develop a tool which makes use of our previous tools.
  - Draw further conclusions regarding qualitative results of match formats.

April 13th:
- Expand our study into similar games, e.g. MOBA drafting.
  - Develop tool(s) which may or may not make use of our previous tools.
  - Draw novel conclusions about different match formats in these other games.

April 27th:
- Write up our research as a publishable paper, including our methods and results.
- Write up our research as a concise blogpost.