League of Legends Game predictor and recommender

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Problem Description

We propose to create a game winner predictor based on the Champions chosen at the start of the game during the draft phase.

The purpose of our project is to see how much of the champion selection comes into play in deciding which team will be the victor.

Then using that information, implement a recommendation system, to help a team choose their champions depending on what has been chosen and banned.

In addition, we plan to see if we could improve the losing team champion composition and see if we could improve their chances of winning.

State of the Art/Related Work

1. Conley, K., & Perry, D. (2013). “How Does He Saw Me ? A Recommendation Engine for Picking Heroes in Dota 2.”
2. L. Costa, A. Souza and F. Souza, "An Approach for Team Composition in League of Legends using Genetic Algorithm," in *2019 18th Brazilian Symposium on Computer Games and Digital Entertainment (SBGames)*, Rio de Janeiro, Brazil, 2019 pp. 52-61. Github repo: https://github.com/tekpixo/moba.aid
3. Lin, L. (2016) “League of Legends Outcome Prediction” http://cs229.stanford.edu/proj2016/report/Lin-LeagueOfLegendsMatchOutcomePrediction-report.pdf

Approach:

For the predictor, we will use the scikit-learn library to see which of these predictors gives the best results in the current patch of the game:

1. Logistic Regression
2. k-Nearest Neighbors

For the recommender, we plan to recreate Costa's results that they were able to achieve from their paper and then when that is finished, try using another algorithm such as Collaborative Filtering to see which algorithm gives a better recommendation.

Team Roles:

We will both help compile the dataset and gather the information of what will be used, because the API provided by Riot Games has a limit of requests when used by free accounts.

For the predictor, each person will be in charge of using different algorithms to predict the winner of each match.

For the recommender, we plan to have one person recreate the Genetic algorithm from Costa's paper and the other use another algorithm to see if we can a better team composition, such as Collaborative Filtering.

Evaluation:

Using modern data from the most recent tournament in League of Legends, we will see how well the old models compare to the new model and data.

We plan to compare our results to the paper by Lin and the one by Conley & Perry, to see how well it performs after all the updates done by the game's developers, to see if it is still a good model.

We will then compare the results from collaborative filtering to the one by the genetic algorithm and see which one is a better recommender.

Timeline:

November 3rd: Finish compiling the list of professional LoL esports players we are basing the data on and also finish writing the code to get the dataset of all the games played by the list of players above using the Riot Games API

November 10th: Finish compiling and cleaning the dataset to remove unnecessary input variables for each model and begin implementation.

November 17th: Finish implementing Logistic Regression and kNN

December 8th: Finish implementing Genetic Algorithm and Collaborative Filtering

December 15th: Final Presentation