Which Objective Wins?

Problem Statement

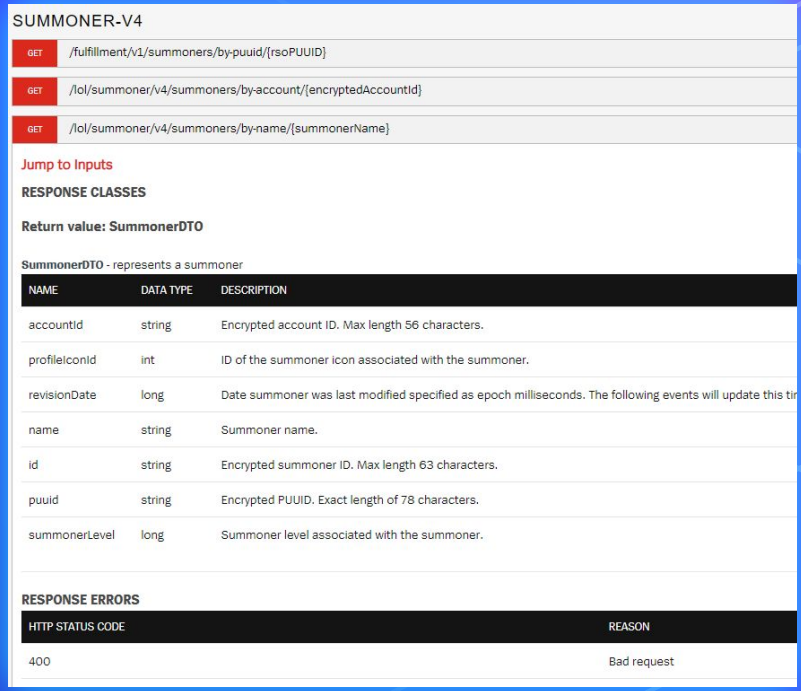
- League of Legends is a zero-sum, partially observable, objective-based team game.
- The value of objective changes as Riot continuously updates the game.
- Determining the objectives that are the most influential to victory is a skill that must be relearned after every patch.

Use-Cases

- League of Legends players looking to improve at the game
- Esport teams looking to quickly adjust to the meta.
- Other games that are objective-based with objectives whose value isn't obvious.
- Determining the features that are critical to an outcome (i.e. risks leading to traffic accidents, causes of a disease)

AI Model and Algorithm

- Took data from professional league of legends matches using Riot API.
- Using this data, we can allow our agent to see information from the game like the dragons taken, first tower taken, etc.
- Train supervised learning algorithms from scikit learn on the data to make predictions.
  - Naive Bayes
  - Decision Tree
  - Support Vector Machine
- Validate the results to determine accuracy



SUMMONER-V4

GET /fulfillment/v1/summoners/by-puuid/{rsoPUUID}

GET /lol/summoner/v4/summoners/by-account/{encryptedAccountId}

GET /lol/summoner/v4/summoners/by-name/{summonerName}

Jump to Inputs

RESPONSE CLASSES

Return value: SummonerDTO

SummonerDTO - represents a summoner

NAME	DATA TYPE	DESCRIPTION
accountId	string	Encrypted account ID. Max length 56 characters.
profileIconId	int	ID of the summoner icon associated with the summoner.
revisionDate	long	Date summoner was last modified specified as epoch milliseconds. The following events will update this ti
name	string	Summoner name.
id	string	Encrypted summoner ID. Max length 63 characters.
puuid	string	Encrypted PUUID. Exact length of 78 characters.
summonerLevel	long	Summoner level associated with the summoner.

RESPONSE ERRORS

HTTP STATUS CODE	REASON
400	Bad request

Demo

Demo Link:
https://colab.research.google.com/drive/1_NN94vkYSVhiJX3wXewREiYHsFk896EL?usp=sharing

Lessons Learned

- Logistic Regression classifier was the best at predicting the outcome given the games (81.29%)
- Having a good amount of data is important to being able to accurately predict the information.
- Machine Learning algorithms are effective at solving classification problems.

Future Work

- Other information, such as individual player statistics, can also be pulled from the matches that might help the accuracy of the model.
- Match data can be pulled live in order to make real-time predictions about matches that are in progress.
- Integration with league stat sites like op.gg or u.gg could grant access to much larger databases of information.

class cassiopeia.core.match.ParticipantStats(**kwargs) [source]

Bases: CassiopeiaObject

Searchable by ['str', 'Item']

assists

baron_kills

bounty_level

champion_experience

champion_transform [source]

consumables_purchased

damage_dealt_to_buildings

damage_dealt_to_objectives

damage_dealt_to_turrets

damage_self_mitigated

deaths

double_kills

Questions

Sources Cited

Images from the league of legends wiki: leagueoflegends.fandom.com/wiki/

Omolade, Oladipupo. "How to Set Up for Objectives in League of Legends." *Senpai.gg*, 30 Nov. 2021. https://senpai.gg/blog/how-to-set-up-for-objectives-in-league-of-legends/. Accessed, 28 Nov. 2023.

Macabasco, Agilio. "League of Legends Objectives: How to Maximize Synergy and Teamplay." *MOBAlytics*, 20 Apr. 2017. https://mobalytics.gg/blog/league-of-legends-objectives- decompilation-guide/. Accessed 28 Nov. 2023.

Riot Games, Inc. "Patch Notes." *League of Legends*, 2023 https://www.leagueoflegends.com/en-us/news/tags/ patch-notes/. Accessed 28 Nov. 2023.

Pedregosa, et al. "Scikit-learn: Machine Learning in Python." *JMLR 12*, pp. 2825-2830, 2011. https://jmlr.csail.mit.edu/papers/v12/pedregosa11a.html. Accessed 28 Nov. 2023.

Claypool, M. et al. "Surrender at 20? Matchmaking in League of Legends." *2015 IEEE Games Entertainment Media Conference (GEM)*, Oct. 2015. https://web.cs.wpi.edu/~claypool/ papers/lol-matchmaking/paper.pdf. DOI: 10.1109/GEM.2015.7377234. Accessed 28 Nov. 2023.

Gaina, R, Nordmoen, C. "League of Legends: A Study of Early Game Impact." *QUEEN MARY UNIVERSITY OF LONDON, UK*, 9 Jun. 2018. https://rdgain.github.io/assets/pdf/league- legends-study.pdf. Accessed 28 Nov. 2023.

Do, T. et al. "Using Machine Learning to Predict Game Outcomes Based on Player-Champion Experience in League of Legends." cs.LG, 5 Aug. 2021. https://arxiv.org/pdf/2108.02799.pdf. Accessed 28 Nov. 2023.

Kim, Y. et al. "What Makes a Strong Team? Using Collective Intelligence to Predict Team Performance in League of Legends." CSCW, 2017. https://mitsloan.mit.edu/shared/ods/ documents?DocumentID=2710. Accessed 28 Nov. 2023.