League of Legends – Recommender System

**Summary**

League of Legends is an online, 5 vs. 5 competitive PC game. It is one of the - if not the most - popular games currently around. Despite that LoL has surprisingly little mainstream coverage, which is most likely due to its complexity - it’s not an easy game to understand. A lot of professional leagues and tournaments for LoL are held around the world. The top prize for the best team is over five million dollars and the average player makes a six-figure income. The question is can we develop a data-driven recommender system using historical game data which can support players to make better decisions?

### Understand League of Legends

* League of legends is a team oriented strategy game. The goal is to work together with your team-mates to bring down the enemy nexus located at the middle of their base before your opponents take down yours.
* Players start by choosing one champion from a list of many. All of them have their own unique strengths and personalities. There are types of champions like ranged, melee or arcane mages depending on the players style of play.
* During the game, champions get stronger in two ways. The first of which is leveling up. Players gain experience by being in the area where the enemy dies and each level unlocks abilities of the champions. At level 6, players can unlock ultimate ability which can change the tide of the game. The second way to get stronger is to buy items using gold obtained by killing enemies in a match. Items bought go to inventory which can be used in the game. There are a wide variety of items and they complement a champion in their own way. When a payer starts the game, the team appears in the fountain and its a safe place to respawn which provides access to the shop.
* Each player starts the game with some gold with which they can buy items to be used in the match. Items can also be upgraded. There are 3 lanes in the game where the players head to (Top, Mid(Middle), Bot(Bottom)). The forest in-between the players also has monsters and killing them provides gold, experiences and buffs. The bases are guarded by powerful turrets which need to be destroyed to get to the enemies nexus.
* The player that destroys the opponents nexus is declared the winner.

### Approach

### Download data from kaggle/ Riot API - https://www.kaggle.com/datasets/datasnaek/league-of-legends?select=games.csv

### The data present is as follows:

* + Game ID
  + Creation Time (in Epoch format)
  + Game Duration (in seconds)
  + Season ID
  + Winner (1 = team1, 2 = team2)
  + First Baron, dragon, tower, blood, inhibitor and Rift Herald (1 = team1, 2 = team2, 0 = none)
  + Champions and summoner spells for each team (Stored as Riot's champion and summoner spell IDs)
  + The number of tower, inhibitor, Baron, dragon and Rift Herald kills each team has
  + The 5 bans of each team (Again, champion IDs are used)
  + Champion details
  + Spells details

### Analyse the data and clean the dataset.

### Use Machine learning models and identify what features (data points) lead a team to victory.

### Improve accuracy of the selected machine learning models by comparing/ bagging (combining) them together.

### After arriving at optimum accuracy with a model, use the machine learning model to recommend the possible steps to lead to victory.

### Tools Used

* Python (Programming language).
* Jupyter Notebook (Environment to run the program).