**Monitoring Game Updates**

**Character balances for the online game—Battlerite**

1. **Introduction**

For this project, I would like to aid game developers in evaluating character balances for online multiplayer arena-based games. Often, games will have large character disparities in which some will be extremely powerful and others will be far too weak. This is undesirable for both the developers, because players prefer games where they can play a character without fear of being at a disadvantage, so I would like to evaluate character balances by monitoring win-rates and pick-rates. Specifically, I will be working with data from a game called Battlerite.

Battlerite is a quick team-based arena game with many characters for players to choose from. Once the players pick their character of choice, they are randomly paired into teams and enter an arena with the objective of defeating the other team in combat. The first team to win 3 total rounds, wins the match. The game has two main formats, casual and ranked; and two game modes, two-verse-two and three-verse-three, which I will abbreviate as 2v2 and 3v3 accordingly.

The formats and game modes result in very different styles of play. The casual format is for players who want to play for fun or try out new characters. The ranked format, on the other hand, is a more serious test of skill where players try to climb through the following leagues: Bronze, Silver, Gold, Platinum, Champion, and Grand Champion. The 2v2 game mode is more dependent on individual player skill, while the 3v3 game mode is more dependent on teamwork.

Because of the different playstyles within the game, I believe the problem of character balances relies heavily on the format, casual or ranked, and game mode, 2v2 or 3v3. I will evaluate each character’s win-rate and pick-rate overall, by format, and by game mode. This will allow developers to see which characters have advantages or disadvantages for each format and each game mode. I will then create several time-series plot examples to evaluate how win-rates and pick-rates for characters change over time. This allows developers to implement balance changes and monitor the difference in win-rates and pick-rates over time.

To achieve all of this, I will pull match data using Battlerite’s API, then store the data in a DataFrame with columns to determine the winner as well as which characters, formats, and game modes were played. I will store all of my work in Jupyter Notebooks written in Python 3, and notate my work in Markdown for easy readability.

1. **Data Wrangling**
2. **Data Collection**

I began by exploring the API, and familiarizing myself with the structure of the data. Once I understood the structure of the data, I created a function to extract the necessary information and store them in an easily accessible DataFrame. I then created another function to get a chunk of data using a specified date. Using these functions I collected data from various days and hours for the months of January 2018 to April 2018. It is important to note that I only collected data for the first week of April, because of the date I began this process, April 10th.

1. **Character Mappings**

Once I finished collecting my data, I created a mapping between the character IDs and their corresponding names using two files I found through the official documentation; a json file, **gameplay.json**, and an ini file, **English.ini**. The **gameplay.json** file includes two IDs for each character, a ‘typeID’ and a ‘name’. The ‘typeID’ is the ID stored in my collected data, while the ‘name’ is an ID in the **English.ini** file that can be used to find each character’s name.

I built a DataFrame using the **gameplay.json** file to store each character's ’typeID’ and ‘name’ ID, then built a second DataFrame using the **English.ini** file to store the mappings of each ‘name’ ID and its value. I then merged these two DataFrames using an inner join to map each ‘typeID’ with the correct name.

1. **Exploratory Data Analysis**
2. **Check if the match data includes ever character**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.

1. **Import newly collected data, and repeat**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.

1. **Character Statistics**
2. **Win rates**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.

1. **Pick rates**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.

1. **Statistics table**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.

1. **Inferential Statistics**
2. **Create functions**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.

1. **Hypothesis tests**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.

1. **Monitoring Changes**
2. **Find imbalanced characters**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.

1. **Simulated updates**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.

1. **Conclusions**

This is random text that I am trying to fill up until this look like a full paragraph. Not quite there yet so I’ll continue typing. It’s starting to look like one now, but I want to fill in a couple more lines to get a better sense of what this will look like when I fill it in with the proper information.