# Legends of League Project Proposal

**Background and Motivation. Discuss your motivations and reasons for choosing this project, especially any background or research interests that may have influenced your decision.**

We're both really into playing League of Legends, and we're very excited about the new game mode, Ultra Rapid Fire, that was released on April Fools Day. This new game mode has brought about a lot of changes, and we would like to use visualizations to further explore those changes in a way that no website or service currently allows.

One of the most important things in a game like League of Legends is game balance. There are 123 champions to choose from, and the game developers, Riot Games, do their best to make sure no one champion is categorically stronger than any other. Normal game modes have been around for years, so Riot has had plenty of time to make sure that all champions and items are as balanced as possible in normal. However, since this game mode is so new, there are drastic balance issues that we are excited to learn more about.

**Project Objectives. Provide the primary questions you are trying to answer with your visualization. What would you like to learn and accomplish? List the benefits.**

We would like to explore exactly how the game of League of Legends has changed due to the introduction of the Ultra Rapid Fire Game mode. Riot Games puts in a lot of effort making sure champions and items are balanced and fair in normal games, but URF disrupts that balance.

We want to be able to explore the popularity and effectiveness of certain champions, popularity and effectiveness of items, changes in game pace, etc. in this new game mode. The visualization we create will give users an idea of how to compose the strongest team with the best item builds, find sleeper picks, and avoid picking champions that don't live up to their hype.

**Data. From where and how are you collecting your data? If appropriate, provide a link to your data sources.**

We are collecting data from Riot Games API (https://developer.riotgames.com/). After making an account, there are scripts available on this website to collect static data, or we can upload scripts to collect data dynamically. We will probably start out with static data, and if we have more time, try and see if we can make our project more dynamic.

**Data Processing. Do you expect to do substantial data cleanup? What quantities do you plan to derive from your data? How will data processing be implemented?**

With just the data for one match, there is about 150 kB of information. Since we will be pulling data from thousands of matches, we will need to do a decent amount of data cleanup and write scripts to extract only the relevant information from each match so as to keep our file sizes manageable.

**Visualization. How will you display your data? Provide some general ideas that you have for the visualization design. Include sketches of your design.**

The included sketch shows what the visualization will start off looking like, which will display different ways to visualize data. However, we want to put a focus on win rate/popularity of champions, so the center bubble chart is larger than the other ones. There will also be multiple ways to filter the data, and each graph will change accordingly with the filter.

**Must-Have Features. These are features without which you would consider your project to be a failure.**

We definitely want to calculate and visualize the following metrics:

- Champion win rates
- Champion popularity
- Average kills/deaths/assists by champion
- Item popularity
- Game Duration

These metrics should be sufficient to make an engaging visualization that will provide valuable insight into issues of game balance and will allow users to find most successful team and item builds. The visualizations we will use to discuss these metrics are described in the “Visualization” section.

**Optional Features. Those features which you consider would be nice to have, but not critical.**

If we have more time or want to add more to our visualization, we would consider calculating additional metrics. For example, we might look at correlations between first blood, first dragon, first baron, first turret, and win/loss outcome of the game. We can add these new metrics in scatterplots to show the importance of gaining quick objectives in games. Another thing to consider is to create an option for comparing to other game modes, which will show how changing the game style changes the results we’ve gathered from the data.

**Project Schedule. Make sure that you plan your work so that you can avoid a big rush right before the final project deadline, and delegate different modules and responsibilities among your team members. Write this in terms of weekly deadlines.**

- Week 1:
  - Sean: Gather data for a large number of games
  - Charles: Start making a visualization based on small sample of games
- Week 2 (first milestone due):
  - Sean: Determine necessary fields, pull, organize and calculate metrics from the large sample size of games we analyze, assist with visualization
  - Charles: Get the prototype visualization looking presentable by the end of the week

- Week 3:
  - Gather picture data for champions and items
  - Create mapping functions from champion and item IDs to their pictures
  - Adapt visualization based on TF suggestions
- Week 4:
  - Finalize visualization
  - Look into and possibly incorporate optional features