Project Title:
LegendMetrics

Team Members:
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Meetings:
Aug 23 2023 - Overview of current progress and first introduction to requirements
Sept 1 2023 - Elaboration on requirements and explanation of key features
Sept 29 2023 - Review of progress and first criticism of UI elements
Oct 27 2023 - Review of progress, revisiting requirements and key features to be implemented
Nov 24 2023 - Presentation of completed features and future steps. Final review of UI elements

Goal and Motivation:

The goal of the Duo-ed application is to create a competitively focused statistics website for the game League of Legends. League of Legends(LoL) is the largest esport game in the world and has over 180 million monthly active players across the globe(riftfeed.gg 2022). LoL is categorized as a Massive Online Battle Arena(MOBA) and consists of team-based matches where players work together to accomplish in-game goals against an enemy team trying to accomplish the same tasks. Whichever team can get the lead and acquire more progress will ultimately defeat the other team's defenses and claim victory. At the heart of the game is the competitive ladder(aka Solo/Duo Queue) which feeds into the collegiate and professional esports leagues. League of Legends esports garners millions of views for the world's championship between professional teams from countries such as North America, Europe, Korea and China. Last year viewership peaked at 5.15 million concurrent viewers during the world's finals game in San Francisco, California(escharts.com 2022). Esports and competitive play is an essential part of the game's success.

As the solo queue ladder consists of online matchmaking against similarly skilled players, a key aspect of the competitive system is player statistics such as win rate, KDA, gold advantage, damage dealt and other comparative stats against the player's competition. Currently there are a plethora of other websites that record match history and other statistics of players that are reviewed and criticized as a representation of a player's prowess. However all of these stat sites focus on the stats of an individual player rather than on one of the most important aspects of the game, teamwork and synergy between players on the same team. Our motivation with Duo-ed is to create a statistics website with specific statistics focused on group play, synergy between multiple players and useful information about player combinations that can be used to evaluate and identify weaknesses and strengths that a player duo can refer to in order to improve. One of the obstacles of this approach is that Solo/Duo Queue(a game mode that only allows for players to play with one other friend) is the main game mode that everyone plays and considers when looking at a player's stats. However, we plan on overcoming this obstacle by offering distinct aspects that track multiple game queue options. We aim to track performance in various queues, including Duo Queue with friends, Flex Queue and Clash (modes allowing full-team play against matchmade opponents) and custom games or scrims (organized matches without algorithmic matchmaking) for esports competitors. Statistics for these game modes are almost nonexistent but we feel that there is a very big niche of players in the competitive community that are looking for this information and that we are uniquely suited to provide the solution for them. One of our members is an active competitor in the North American League of Legends collegiate scene and is representing the LoL esports program at Florida Tech. After years of being in the competitive League community and using resources and sites tailored to the general population of players, the client has noticed issues with having to use multiple different websites all at once in order to get the required information necessary for scrimming other teams and some of the information is inaccessible. The client is looking to find a comprehensive solution

for aggregating information, tailored to the needs of the collegiate and competitive LoL community and specifically for groups of players who frequently play matches together.

Key Features:

Win rate and other statistics about players who frequently play matches together. We would be looking at win rates and other stats compared against the player's competition(players that were directly played against), other similarly ranked players or a user inputted selection(supporting single, double or 5 player per team queries). These stats are the backbone of the website and similar stats can be found on other websites though not in the same form or speciality as we plan on displaying them as.

The specific stats we would be looking at would be:
- Win rate as a duo/team
- Win rate on a specific champion duo/composition combination
- Duels win rate as a duo
- Duels win rate on a specific champion duo combination
- Teamfight participation as a specific player in a duo
- Teamfight participation as both players in the duo
- Teamfights win rate as a team
- Teamfights win rate on a specific champion composition combination
- K/D/A of each player on a duo/team
- K/D/A of each player on a specific champion duo/composition combination
- Solo deaths while in a duo
- Solo deaths of each player while on a specific champion duo combination
- Gold advantage, gold/min and percentage of team gold of each player on a duo/team
- Gold advantage, gold/min and percentage of team gold of each player on a specific champion duo/composition combination
- Gold advantage, gold/min and percentage of team gold of a duo(combined)
- Gold advantage and gold/min of a team(total)
- CS/min of each player on a duo/team at the end of the match and at different times in the match
- Cs/min of each player of each player on a specific champion duo/composition combination at the end of the match and at different times in the match
- Kill participation of each player on a duo/team at the end of the match and at different times in the match
- Kill participation of a duo(combined) at the end of the match and at different times in the match
- Kill participation of each player on a specific champion duo/composition combination at the end of the match and at different times in the match
- Kill participation of a duo(combined) on a specific champion duo combination at the end of the match and at different times in the match

- Roaming kills/assists of each player on a duo/team at the end of the match and at different times in the match
- Roaming kills/assists of each player on a specific champion duo/composition combination at the end of the match and at different times in the match
- Damage dealt, damage/min and percentage of team damage of each player on a duo/team at the end of the match and at different times in the match
- Damage dealt, damage/min and percentage of team damage of each player on a specific champion duo/composition combination at the end of the match and at different times in the match
- Damage dealt, damage/min and percentage of team damage at the end of the match and at different times in the match
- Damage dealt and damage/min of a team(total) at the end of the match and at different times in the match

Team lookup and comparison page:

An all in one page that shows both 5 person teams stacked comparatively for esports and competitive teams to view when creating drafts and reviewing potential scrimmage matches. This should compare players with their direct role(lane) opponent and the team as a whole with options to toggle looking at stats for solo/duo queue, flex queue, clash or custom games, as well as an option to view all available match statistics.

Duo, clash or scrim looking for group(LFG) page:

A way for players looking for a teammate to play ranked with or for a team looking for a scrim partner to find other interested parties. Should support options for duo queue, flex queue, clash and scrim teams. Should provide a stat page for the team/player including an average(in game) rank and a trustworthiness/reputation rank(peer reviewed rank).

Novel features:
The team lookup and comparison page is considered a novel feature since it's already available from other websites and it's not crucial for the niche of players we are attracting at the onset of deployment. However, we would still prefer to have it as a bonus feature to make QOL when using the site better.

Future/Optimistic Features:
These are features we'd like to implement if we have the time to but are currently out of the scope of the timeline for this project.
Match history panels: A feature present on other LoL stat websites but not necessary for the niche we are looking to fulfill. However in the interest of widespread adoption of this project, these panels should be implemented at some point.
In-depth match details: A companion feature to match history panels, displayed as a drop down option on the panel but again out of the scope of this project.
Drafting tool: A feature not found on other stat websites but necessary for collegiate and competitive play. We would like to implement this feature in ver. 2 of this project

Technical Challenges:
We will need to manage a sizable quantity of data for the comparison stats page and make sure that our queries work quickly and efficiently. In order to balance the amount of data we must provide enough servers to store the database and have a strong enough API in order to transfer and handle the data. We also need to think about how to deal with missing or insufficient data, such as when a player hasn't participated in enough games or has repeatedly switched roles or champions. When data is lost it will corrupt the calculations and statistics being used to present to the user. In order to handle this we must create a sufficient amount of frequent backups in order to prevent as much data as possible from being lost. For the team lookup and comparison page, we must link with other APIs or databases that offer details about the players and teams, such as their ranks, roles, champions, match histories, etc. All the specifications that will be used to calculate correct statistics for the user and will need to use multiple APIs to handle sufficient data traffic. For the LFG page, we need to create a system that matches players or teams based on their preferences and availability. Additionally, we may have to handle scenarios in which a player or team withdraws, disconnects, or changes their mind before or during the game. Such systems as a queue timer, a report system, or a reputation score could need to be put in place in order to discourage or sanction such actions. The website will also need to have the proper security to protect the users data along with the threats of cyber attacks. Protecting the users data is the number one priority with a free based platform such as this one. The network infrastructure will also need to be backed by efficient and stable servers and web applications.

Design: system architecture diagram
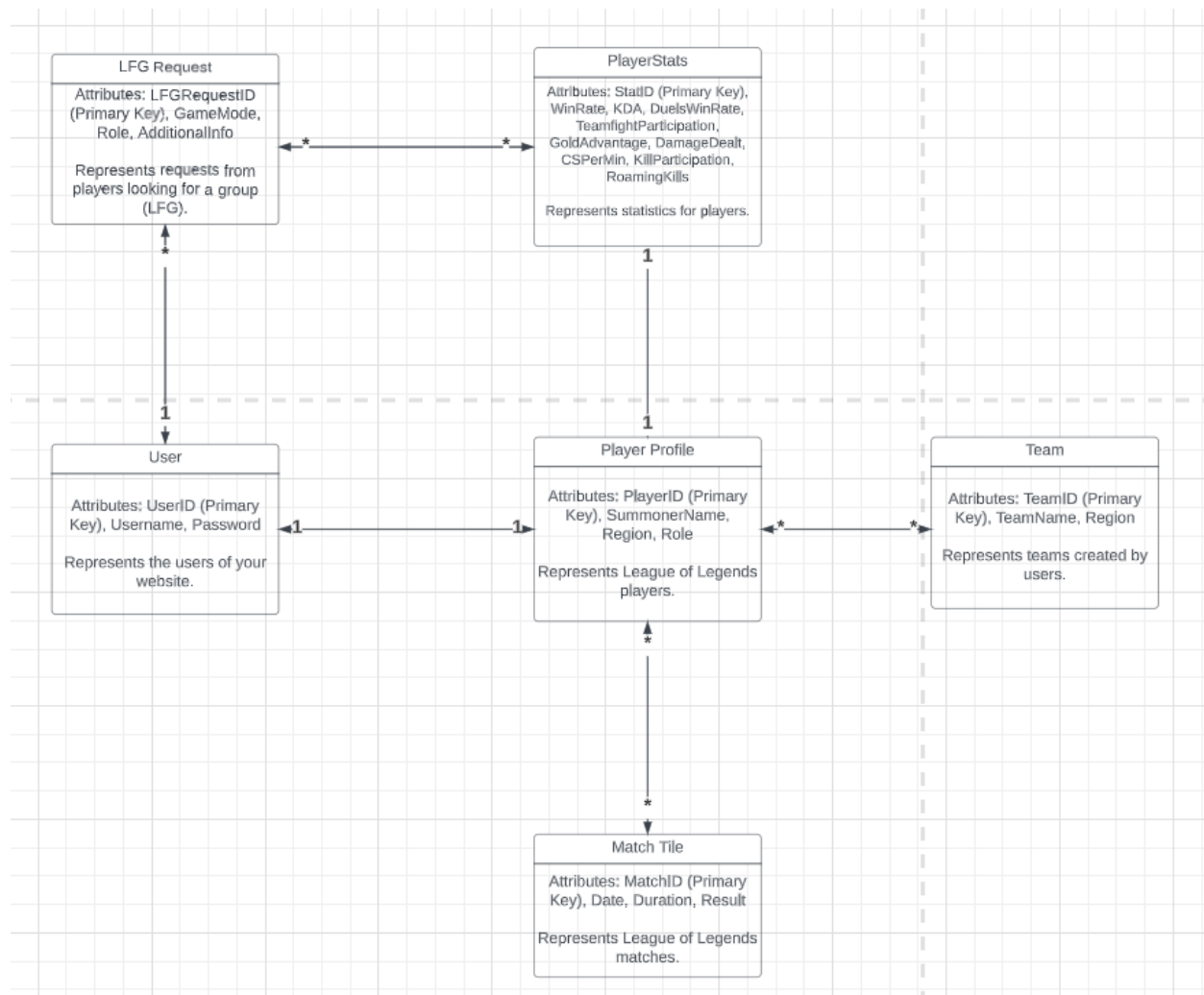
Evaluation:
How to measure success? Success can be measured by evaluating the overall functionality of the website. Does each feature perform the way it's intended? Another way we can measure success is evaluating the amount of features our website provides. Out of all the features we intended to implement, how many did we manage to implement? Lastly, we can measure success by evaluating the user experience. Is our website easy to use and does it provide valuable information to our users?

Progress Summary:

Milestone 4 (Oct 2): itemized tasks:
- Implement SQL queries into existing codebase to pull statistics from the database
- Implement functions to calculate stats
- Implement charts/graphs(visual representation of data)
- Implement first revision of UI

Milestone 5 (Oct 30): itemized tasks:
- Implement team lookup page
    - Front and backend
- Revisit and review comparative stats page with client
- Implement and test second revision of UI
- Conduct evaluation and analyze results
- Create poster and ebook page for Senior Design Showcase

Milestone 6 (Nov 27): itemized tasks:
- Implement LFG page
    - Front and backend
- Implement and test final revision of UI
- Test/demo of the entire system
- Conduct evaluation and analyze results
- Create user/developer manual
- Create demo video

Task matrix for Milestone 4:

Task	Jesse	Maxx	Preston	Rayne
1. implement, test & demo SQL queries	100%	0%	0%	0%
2. implement, test & demo statistics functions	50%	0%	0%	50%
3. implement, test & demo visual representation of data	5%	5%	50%	40%
4. implement, test & demo website back end	5%	65%	30%	0%
5. implement, test & demo website front end	10%	70%	10%	10%

Description (at least a few sentences) of each planned task for Milestone 4:
- Task 1: Writing SQL queries to pull specific data from the database including win rate, duels, participation, K/D/A, solo deaths, gold advantage, CS/min, kill participation, roaming kills, damage dealt. These stats are buried in the .json objects that are returned by the api calls and need to be added to the database on a per match basis with insert statements and then collected and compared by select statements against the other ids of players in the match
- Task 2: Integrate SQL queries into the main python script and run calculations to get in depth statistics. Output the statistics to the client.
- Task 3: Take statistics and integrate them to bar graphs and line charts for client facing UI. Create scripts for running the functions outside of the main codebase when database is already updated with the latest information.
- Task 4: Design the website and have it hosted. Add integrations to run script when user input is entered. Display charts to the users.
- Task 5: Make aesthetically pleasing. Organize information so it's easy for users to access. Add separate pages.

Approval from Faculty Advisor:

"I have discussed with the team and approve this project plan. I will evaluate the progress and assign a grade for each of the three milestones."

Signature: _____ Date: _____