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STOCKTON UNIVERSITY
Esports Program

League of Legends

In-House Balancing Assistant

Technology Stack	
ℹ	Python and Flask
ℹ	Linux running NGINX
ℹ	MySQL database
ℹ	Riot API
ℹ	Bootstrap CSS

System Functionality	
☑	Interface with Riot API to determine player statistics
☑	Award & store points for players based on match results
☑	Display a public leaderboard showcasing points earned by each player
☑	Allow tournament administrators to create and balance teams for matches
☑	Develop player suggestion / auto-balancing feature using player statistical data
☑	Forgot username and password reset functionality for administrator accounts

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Client Recommendations

❗	Implement TLS for all client sessions brokered by web server
❗	Hash (SHA-256) and salt passwords stored in database
❗	Perform hashing operation on client-side (JavaScript) before transmitting to server
❗	Implement application configuration file
⚠	Consider segmenting database accounts to mitigate impact of SQL injection
⚠	Consider using stored procedures (SP) or object-relational mappers (ORM) for database calls
⚠	Consider adding API configuration metadata to application configuration file
☑	Patch code segments where uninitialized variables may be used (fixed)

❗ **Required**	⚠ **Future Release**	☑ **Patched**

Narrative Response

The project is coming along nicely, satisfactorily implementing the core features outlined by the group in our initial discussions. Client had an opportunity to meet with the group on 12/4 for a live demo. Members in attendance included Eric, Erick, and Kayla. The group was able to answer questions to a satisfactory level about the product features and functions.

Feedback was provided addressing client concerns related to lack of TLS implementation and concerns related to clear-text passwords being stored in the database. A source-review by the client identified potential vulnerabilities related to uninitialized variables that were subsequently fixed to a satisfactory level by the group members.

The data model reveals that a single database account is used to query and perform CRUD operations across all tables. The client recommends implementing at least two database accounts to assist in the mitigation against SQL injection attacks. One would be used for public

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reads to display leaderboard statistics, one could be used for administrative actions like awarding points, and possibly a third internal administrative account used to read/write data to the `admin_accounts` table when admin accounts are created/removed or when a password reset is requested.

It has been noted that this project interacts with the most up-to-date version of the Riot API (2019 release version 4). Riot's policy regarding deprecation states that they will maintain previous API functionality for 60 days once a new API is released. One optional recommendation would be to include information about the API endpoint and its format in the application configuration file, so as the Riot API evolves, simple configuration changes could be used to interact with newer versions of the API. Considerations for how the API has evolved thus far must be leveraged to provide insight as to what's changed thus far and could inform the programmers as to what changes may be coming in the future.

It is the opinion of the client that the project is of sufficient quality to be deployed and used by members of Stockton Esports to administrate in-house League of Legends tournaments and to maintain a public in-house leaderboard. While there are some client recommendations, the application does what they set out for it to do. **The client did not witness the program or application crash, or return unexpected results during testing and verification processes.**

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