RTS Analyzer: Iteration One

Software Engineers:

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- *Hoyoung Kim – UI Developer*

Institution: Utah Valley University

Course: CS4550-601 2024 Spring

Organization

Coding Standards

Commenting

Functions

- Brief description of function
- Parameters
- Return Values

Classes

- Brief description of class

ChatGPT

- Highly recommend to let ChatGPT do most of the commenting
- Double check any comments by ChatGPT

Programming Paradigm

- Object oriented

Naming Conventions

- Classes: CapWords
- Functions: snake_case
- Variables: snake_case
- Constants: ALLCAPS
- Files/Folders: snake_case

Code Formatter

- Run all python files through black

Software Requirements

Data Collection and Processing

Sc2reader

- Utilize python module for accessing SC2 replay data.

Backend Development

Django

- A high-level Python web framework that encourages rapid development.

SQL Alchemy

- For storing replay data

Frontend Development

React

- Used for building dynamic and responsive user interfaces.

Version Control

GitHub

- Used to store project, allows for collaboration and version control

Communication

Discord

- Used for meetings and messaging

Microsoft Teams

- Used for meetings

Message App

- Used messaging

Task Organization

Trello

- Used to track tasks and progress on the project

Scheduling

Meetings

- M/W/F – 10:30am, 30min
- T/Th – 2:30pm, 30min
- Otherwise by Appointment

Requirements Gathering

Functional Requirements

- Analyze groups of replays.
    - Determine build order
    - Determine win rates based on races
    - Determine win rates of build ‘A’ vs build ‘B’
- Import and display build order to live game.

Non-Functional Requirements

Summary: These requirements do not pertain to specific behaviors or functionalities of the application but rather to its overall attributes and characteristics.

Performance and Responsiveness

- The application should be capable of processing and displaying data with minimal latency.
- It should handle high volumes of concurrent users and data requests efficiently.

Scalability

- The system should be scalable to accommodate a growing number of users and an increasing amount of data.

Reliability and Availability

- The application should have high uptime, with minimal downtime for maintenance or updates.

- It should be reliable in delivering accurate and consistent analytics data.

Security
- Strong measures for data security, including encryption of sensitive data and secure handling of user information.
- Implementation of proper authentication and authorization mechanisms to protect user accounts and data.

Maintainability and Modularity
- The codebase should be well-organized and documented for ease of maintenance and updates.

Usability and Accessibility
- The user interface should be intuitive and user-friendly, catering to both novice and experienced gamers.
- The application should be accessible to users with disabilities, complying with relevant accessibility standards.

Compliance and Legal Requirements
- Adherence to legal and regulatory requirements, such as data protection laws (e.g., GDPR, if applicable).

Risk Analysis

Technical Risks

Risk of Inaccurate Analysis
There's a risk that the program may not accurately analyze replays due to incorrect logic, outdated algorithms, or compatibility issues with different SC2 versions.

- Mitigation: Regularly update the program to align with the latest game patches, and thoroughly test the program with a variety of replays
- Contingency: Temporarily remove feature that is inaccurate until we can guarantee accuracy

Risk of Incompatibility with Future SC2 Updates
Future updates to SC2 might change the replay format or introduce new features not supported by the current program.

- Mitigation: Plan for regular updates and maintenance and stay informed about upcoming SC2 updates.
- Contingency: Make it so the program doesn’t accept replays past the date of the new update until the program is compatible with the new version of sc2 replays.

Legal and Compliance Risks

Risk of Data Privacy Violations
If the analytics tool collects user data, it must comply with data protection regulations like GDPR or CCPA.

- Mitigation: Implement strong data privacy policies and only collect necessary data with user consent.

- Contingency: Shut down program until it complies with data protection regulations.

Operational Risks

Risk of Dependency on External Libraries
The project might rely on external libraries (like sc2reader) which could become outdated or unsupported.

- Mitigation: None
- Contingency: Drop project

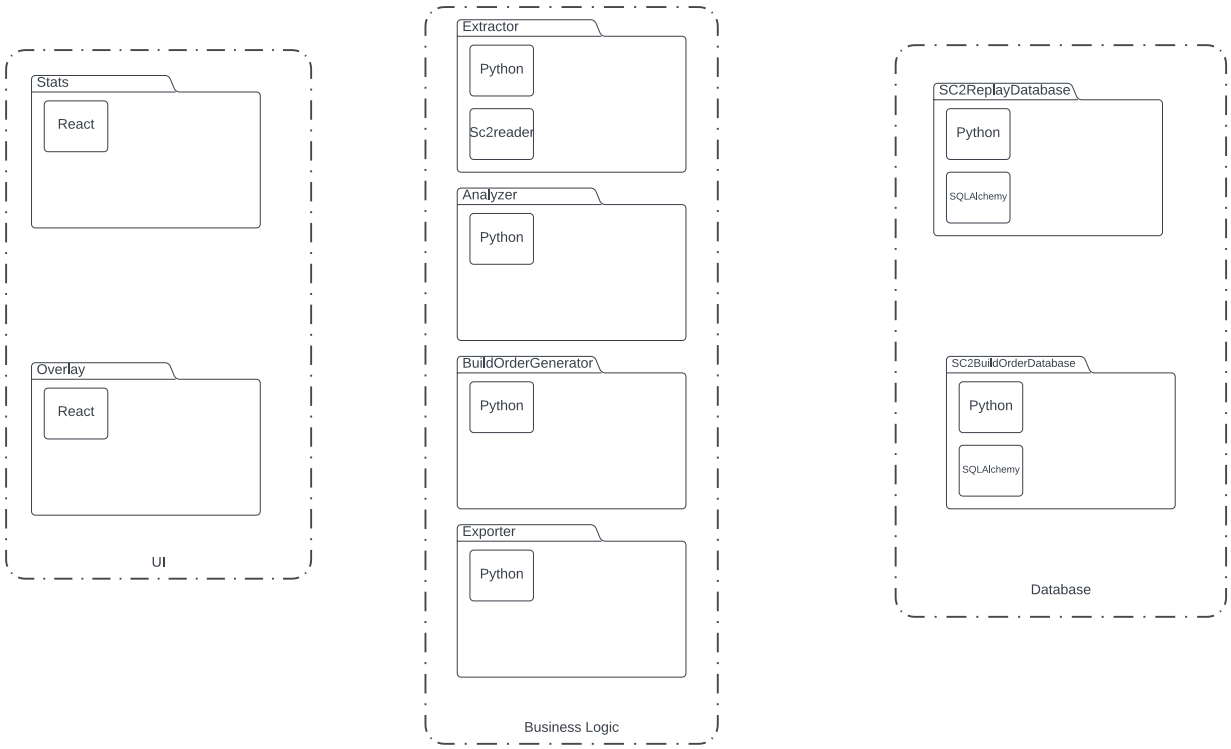
Risk of Insufficient Testing
Inadequate testing can lead to undetected bugs and issues in production.

- Mitigation: Implement comprehensive testing strategies, including unit tests, integration tests, and user acceptance tests.
- Contingency: Fix bugs, possibly rollback to previous version of product and add more comprehensive testing

High Level Design

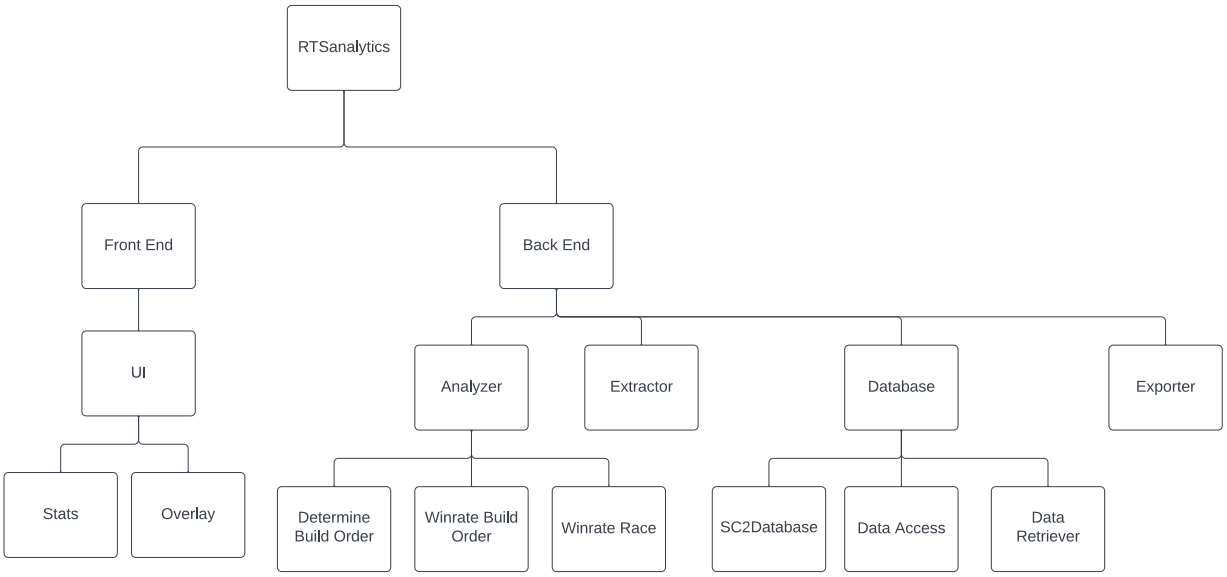
Layered Architecture

Description: Depicts all the high-level modules, what tools are used to create them and how they can be categorized



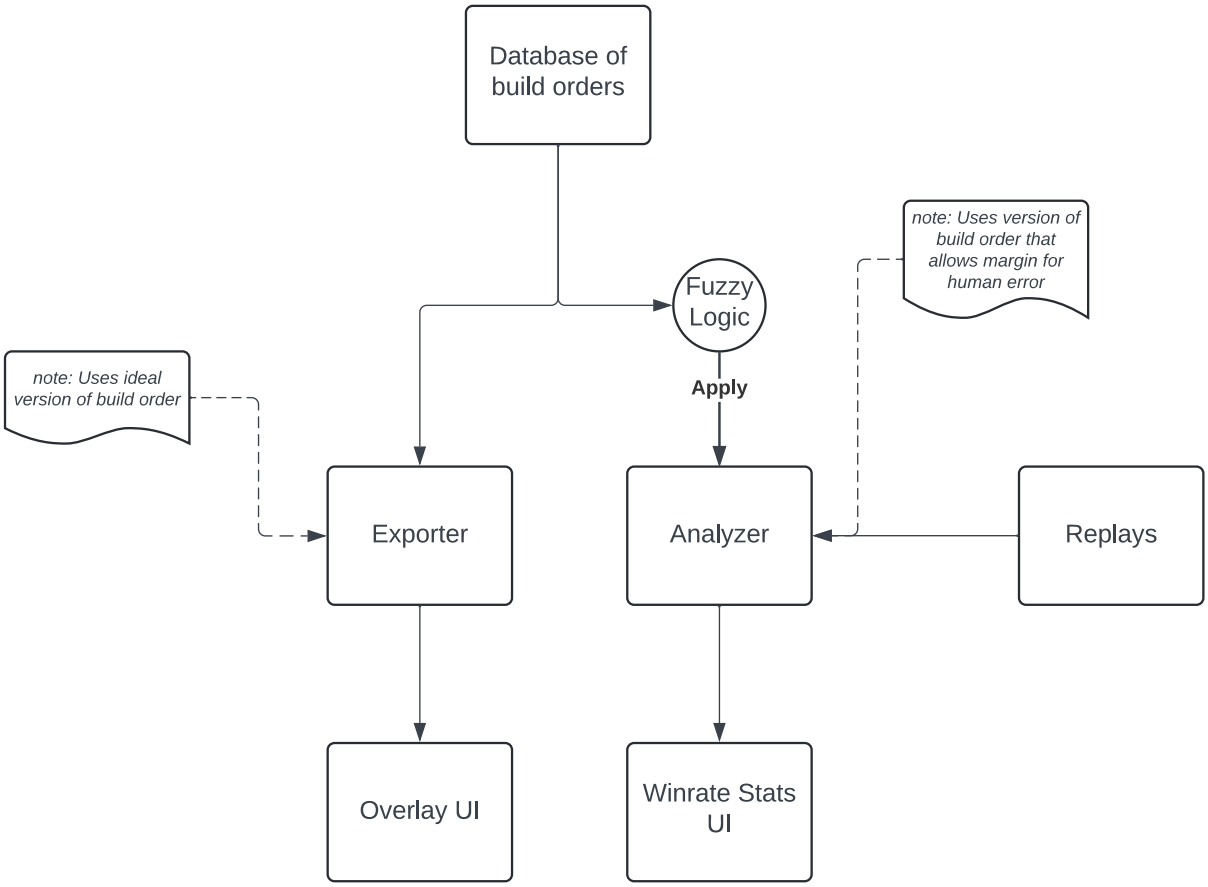
Hierarchical Architecture

Show how all of the high-level modules are split into low-level modules



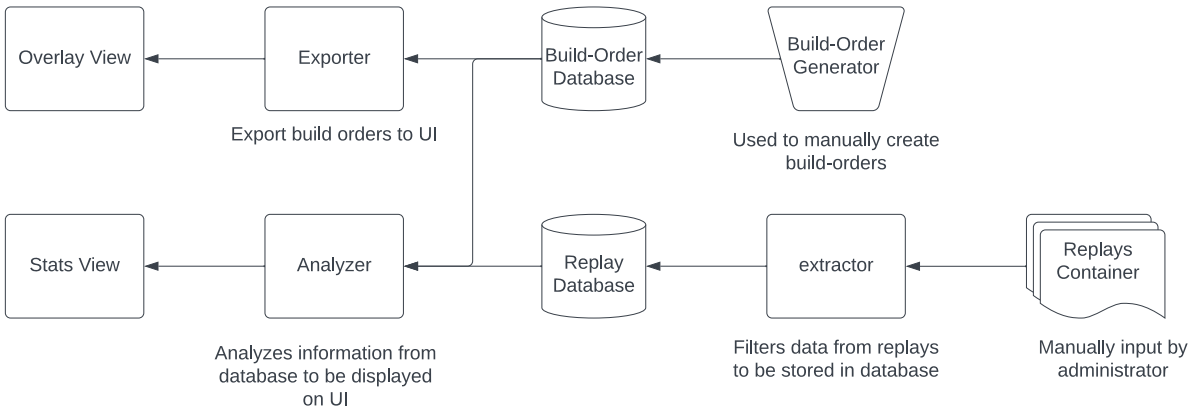
Build-Order Relationship Diagram

Description: Shows how different programs will use the list of build orders and interact with the UI



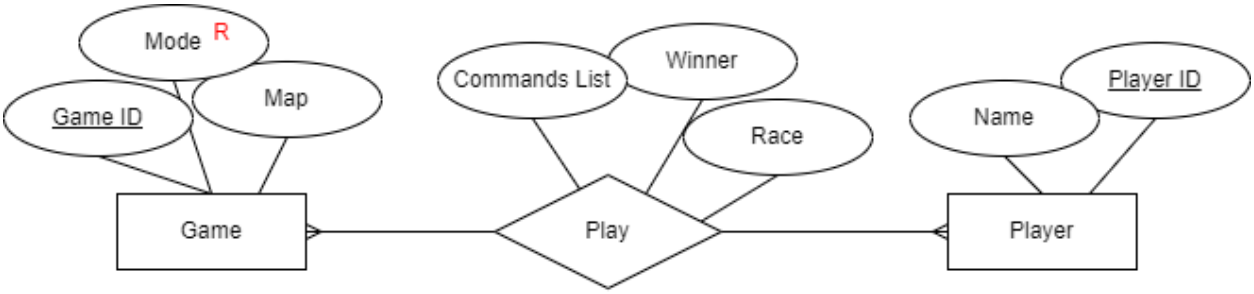
Data Flowchart

Description: Depicts all the high-level modules in the project and how data flows between them



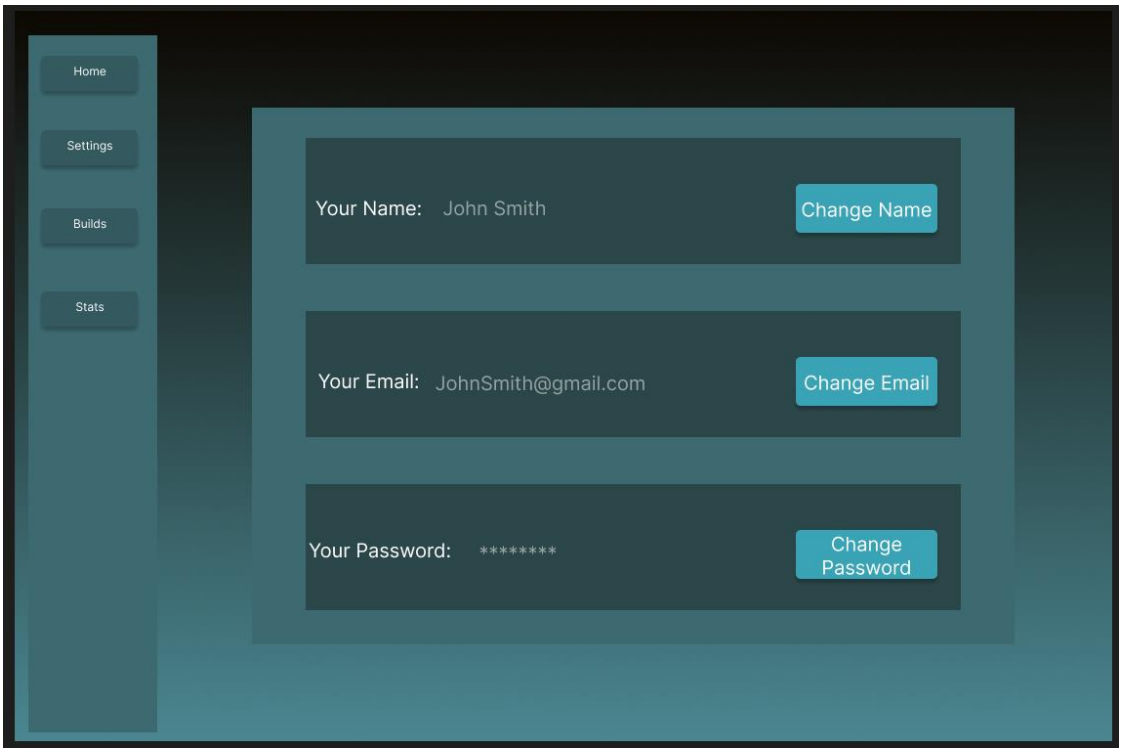
SC2 Replay ER Diagram

Description: Depicts all the entities in the database and their relationships to one another



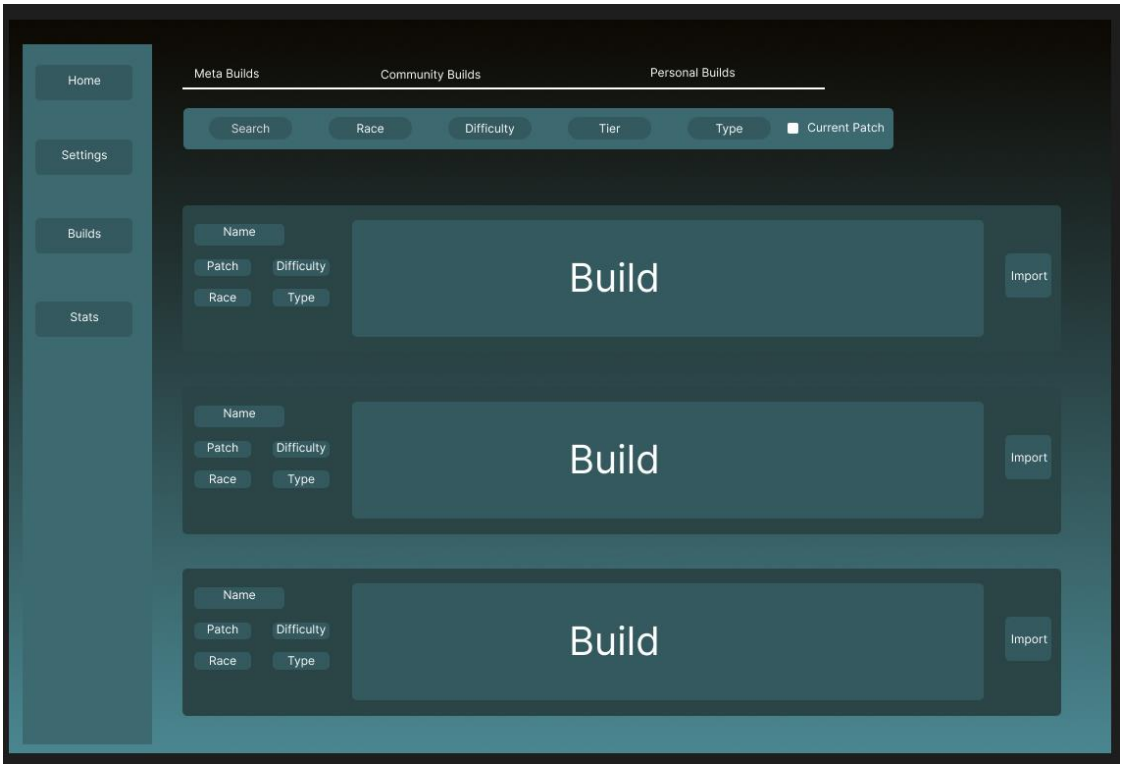
Wireframes

Accounts

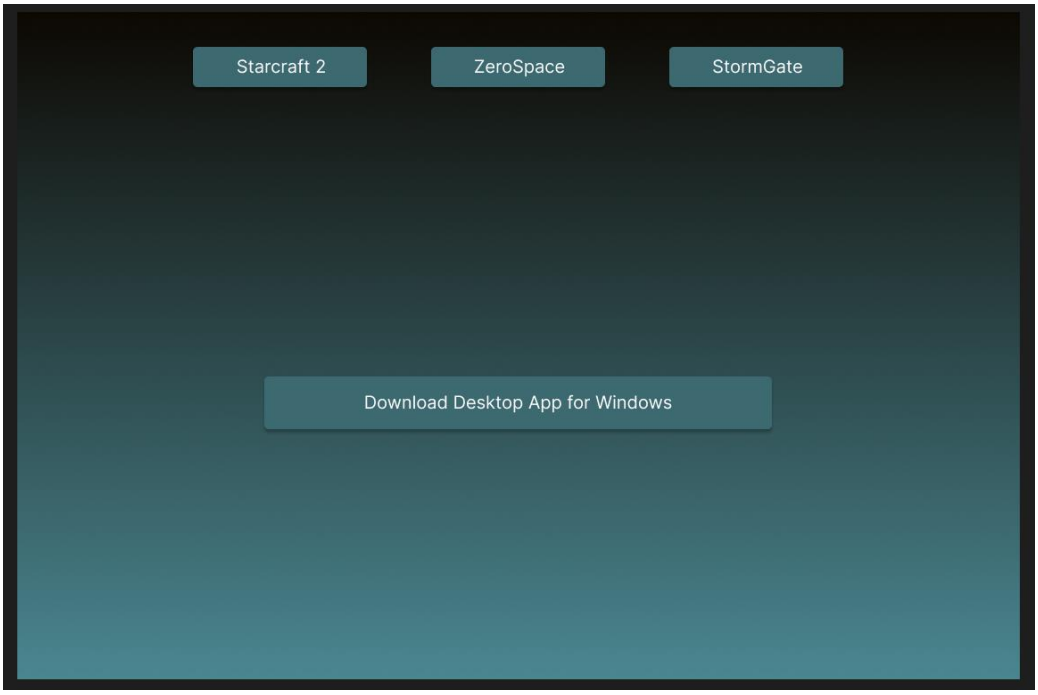


RTS Analyzer

Builds

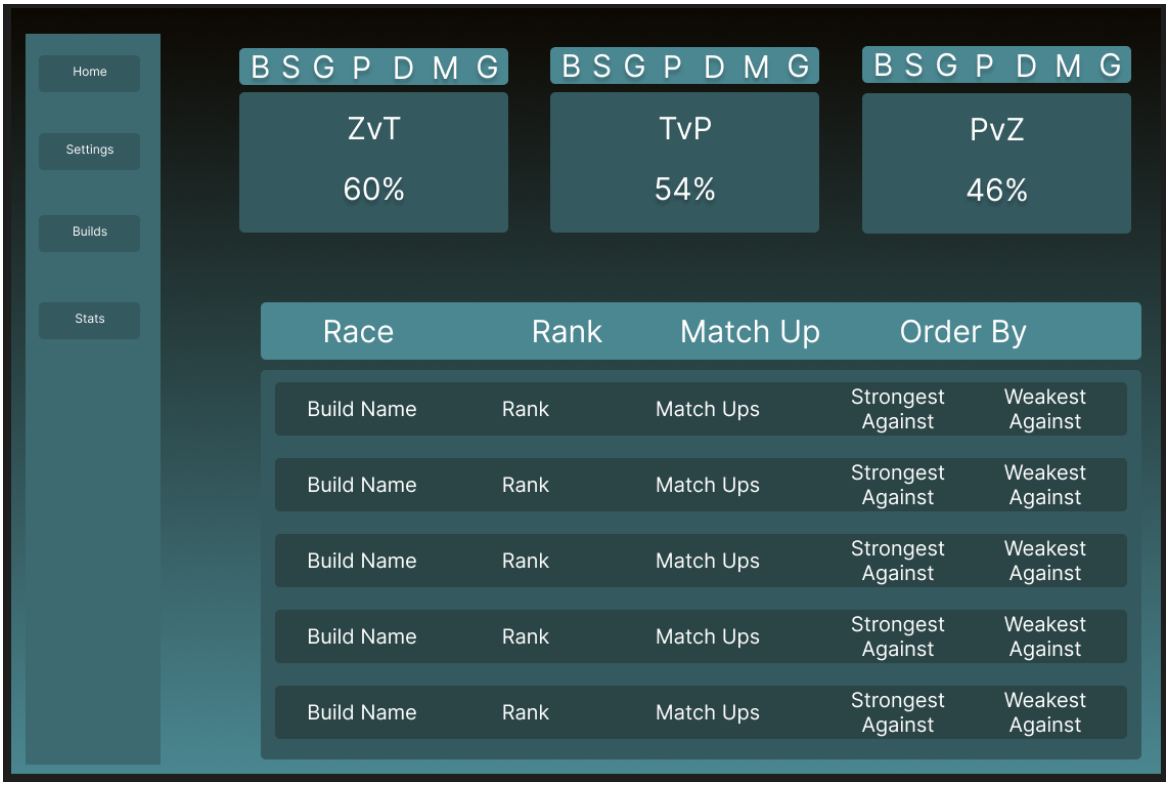


Home



RTS Analyzer

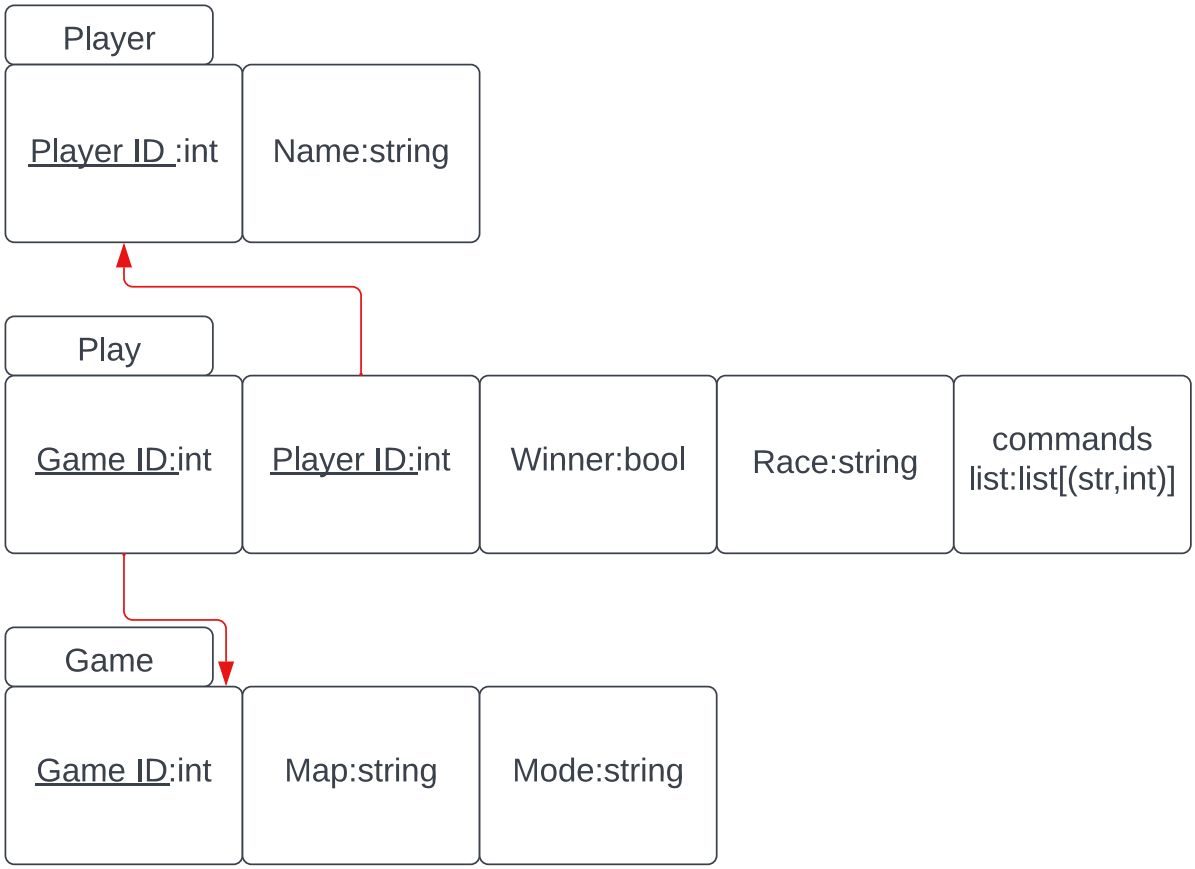
Stats Page



Low Level Design

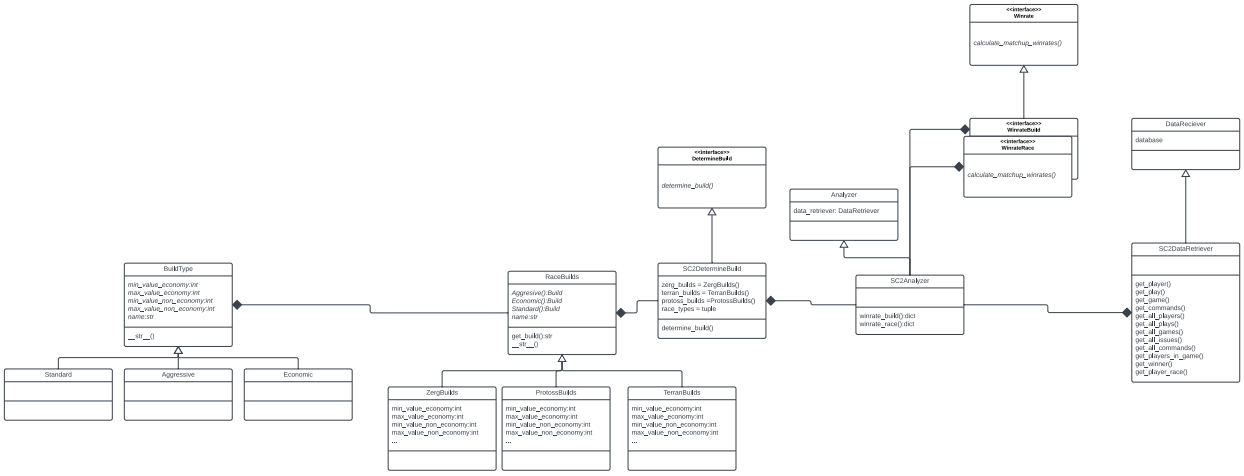
SC2 Replay Schema

Description: Depicts how the entities and relationships from the SC2 Replay ER Diagram will be converted into tables for the database



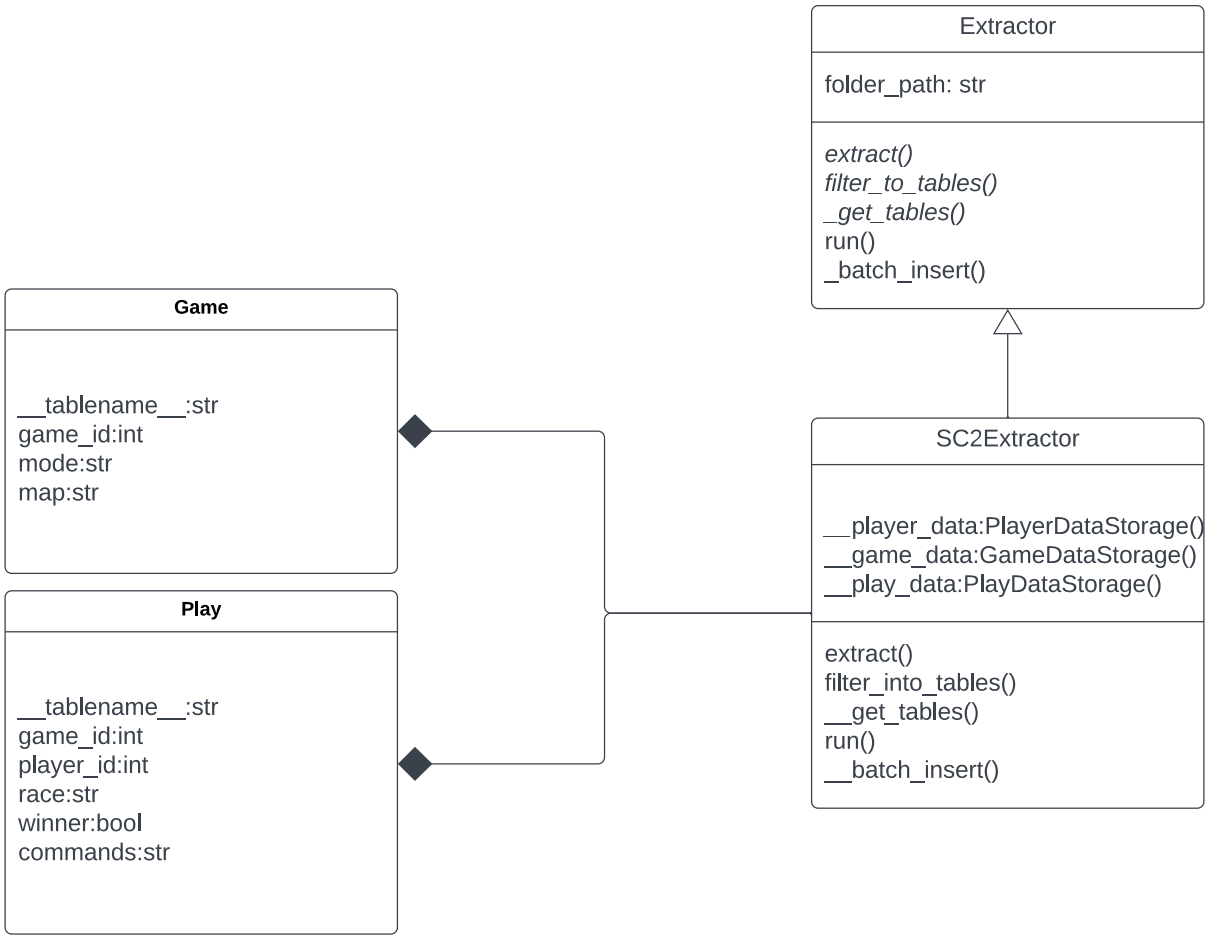
Analyzer Class UML

Description: UML class diagram of the analyzer portion of the project



Extractor Class UML

Description: UML class diagram of the extractor portion of the project



Development

Testing

Pytest

Description: We created unit tests for all of the methods in every programming file, these are the results