

Progress Report  
- Increment 3 -  
Group #25

## **1) Team Members**

Erik Princi - ep16g - nole444  
Noah Lee - nhl18b - TomahawkEVO  
Keene Meckfessel - kcm22f - keenemeck

## **2) Project Title and Description**

Our project is a web application intended to simulate F1 tire strategies in races. We want to have a login-based scoring system with scenarios for users to experiment with. Specifically, users will be presented with a driver in a particular scenario, and are then prompted with all available data to make a decision on the strategy. Each scenario will have an optimal strategy, and users will be scored depending on how close to that strategy they get. Logging the results of the simulation and the users' predictions will show them their progress over time and will be stored in a database only accessible through an account system.

## **3) Accomplishments and overall project status during this increment**

During the final development increment of the F1 Strategy Web App, our team has achieved a cohesive application incorporating front and back end code to create the full simulation web tool tailored to the needs and desires of Formula 1 enthusiasts. This period has been marked by significant achievements in backend development, database integration, and foundational feature implementation, aligning closely with our initial project scope and functionality objectives.

One of the cornerstone accomplishments of this increment has been the successful integration of the PostgreSQL database with our Flask-based backend. Establishing a robust connection between the application and the database ensures reliable data persistence, enabling the storage and retrieval of essential information such as user profiles, race data, and prediction results. This integration not only guarantees data integrity but also lays the groundwork for scalable data management as the application grows. By implementing Flask-Migrate, we have streamlined the process of handling database migrations, ensuring that schema changes can be managed efficiently without compromising existing data.

Our team has diligently developed the backend architecture, focusing on creating modular and maintainable code structures. We have built and refined core classes responsible for user authentication, data handling, and the simulation logic that underpins race predictions. This modular approach facilitates easier updates and feature expansions in the future, ensuring that the

application remains adaptable to evolving user needs and technological advancements. Additionally, by leveraging Flask's capabilities, we have ensured that the backend is both robust and flexible, capable of supporting complex functionalities with ease.

A significant milestone achieved during this increment is the integration of the simulation logic for race predictions with our web application front-end. The simulation logic was overhauled to leverage API tools developed during previous iterations, as well as to incorporate new features such as strategy accuracy analysis and a timing sheet output. Compared to real data, our simulation algorithm is consistently accurate within 2%. This feature is central to the app's value proposition, providing users with data-driven insights to enhance their strategic decision-making. The integration of the simulation engine with the front-end developed in previous increments means that we now have a cohesive application.

While the primary focus has been on backend and database development, we have also made strides in enhancing the user interface. The user account page ([account.html](#)) has been updated to include placeholders for future features such as achievement badges and detailed race listings. These placeholders ensure a cohesive and user-friendly interface, maintaining a consistent user experience as we continue to develop and integrate more complex functionalities. This forward-thinking approach allows us to design the frontend in tandem with backend developments, ensuring seamless integration of new features as they become available.

Several changes were made on the visual front, bringing the product closer to what the finished version should look like. This includes making the UI more intuitive to navigate, as well as small visual effects that should make the app more pleasurable to look at and maneuver about.

#### **4) Challenges, changes in the plan and scope of the project and things that went wrong during this increment:**

As a team we spent a considerable amount of time working together to ensure that our individual pieces of code were prepared correctly to be integrated into the final web application. We made some small changes to how the user would go about selecting their driver, how to incorporate tire/strategy options (i.e. how much freedom to give users in this regard) as well as how to share and analyze the resulting data following a race simulation.

#### **5) Team Member Contribution for this increment**

Noah Lee - Contributed to this document, including sections 2, 3, 4, 5 and 6. Also contributed to sections 5 and 6 in the IT document. Overhauled the race simulation engine, including the incorporation of strategy analysis, the simulation of a full 20-car grid (rather than just the 1 user

selected car,) inclusion of the API tools developed by Keene and the transition from a user prompted/terminal output application to one taking in and returning data to our web application front end.

Erik Princi- Contributed to the IT, RD, and progress report document. I also was able to connect the Database to the app. I successfully connected the PostgreSQL database. I then set up the home.html page using CSS and bootstrap for styling. A user can now create an account and it will be stored in our database. I also was able to integrate the F1 API functions and simulation to the front-end. So, the user can now make a guess and it will display their accuracy. It will also display the real-life race result standings.

Keene Meckfessel - Contributed to the IT, RD, and progress report documents. Finishing touches were placed on the remaining codebase, including comprehensive documentation of the code. Additionally, I worked with Erik and Noah to get our individual modules to work together so that our project functions as a whole.

## **6) Plans for the next increment**

N/A

## **7) Stakeholder Communication**

Dear Stakeholders,

We are glad to present you with a finished version of our F1 Strategy Web App. We have been hard at work, combining our progress into a single, comprehensive display that matches our original vision. The connection of our application to a PostgreSQL ensures user data and race information persists from each visit to the site, allowing users to log their history and track their progress within the app. We have guaranteed that the simulation results are accurate with 2% of real race data, so consumers can be assured that what they are seeing with the app is incredibly precise and realistic. With our UI improvements, we hope to see many users continue using the app at its fullest potential, enjoying the many features we worked to make sure it works as seamlessly as possible. With that, we would like to thank you for your continued support and trust in our team. We remain dedicated to delivering a high-quality application that meets your expectations and serves the needs of the F1 community effectively.

Sincerely,

Erik P. , Noah L. and Keene M.

**8) Link to video**

Paste here the link to your video.