Progress Report

- Increment 2 -

Group #3

**** Note: Our current, up to date code can be found in the Increment-2 branch of our repository. Main is not up to date, as we believe we have to update it only after Increment-2 is graded****

1) Team Members

- Luke Meetre, LSM21C, ThatchyCube
- Kevin Rios kr22e, Krios0802
- Christopher Tucker cmt21b, christkr
- Daniel Tribaldos,dft21,Danieltri30

2) Project Title and Description

AI-Based Over/Under Predictor for NBA Games

Full-stack web app which will be able to predict particular stat lines in the NBA to assist people with sports betting.

3) Accomplishments and overall project status during this increment

For this increment, we completed a lot of the intermediate points of the project including adding to the front-end design by allowing users to see the current games, and the visuals for the chat log. Login authentication has been set up and allows users to sign up with their emails, and use those credentials to login. It gets stored in a firebase database that manages this. We also begin to make use of an RNN which takes in the box scores for each game and makes predictions over a range of categories. We wanted our code to allow the users to view predictions for player and game outcomes of their choosing. Instead of just simply predicting win or loss we wanted to make use of the large amount of data we can obtain on a per player/game basis.

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

Front End: Some challenges that were faced when working on the front end was the navigation bar when logging in as it does not hide login and sign up tabs after. This will be tackled in increment 3 as it keeps giving errors. Additionally we will continue to expand on the front end visuals and functionality to make the user experience smooth and enjoyable. Some challenges specifically for the design with the frontend revolved around successfully utilizing the balldontlie API due to restrictions such as CORS. This was overcome by developing a proxy-server that interacts with the API which the frontend makes requests to and then updates the UI. We also implemented our chat page that takes

in user input and currently gives a mock response. The idea is that this is where we will then link the back end with the front end in order for the user to interact with the AI.

Back End:

Initially we tested a win loss predictor using keras. It worked, however it was based on only win/loss amount, home or away, and average points scored by each team (on a per matchup basis, not a per game basis). This approach would not work well for what we had in mind and we decided to instead make use of per game box score data. It was difficult to aggregate this data, and we had to sort through some incomplete entries. Eventually our data was in shape although it was still difficult to decide what model we should use to predict with.

5) Team Member Contribution for this increment

a) progress report*:* Kevin Rios, Luke Meetre, Christopher Tucker, and Daniel Tribaldos completed the progress report working on each section together, making sure the information is accurate and completely reflects what has been completed within increment 2.

b) *the* ***requirements and design document****:* The RD document was completed by Christopher Tucker, Daniel Tribaldos, Luke Meetre and Kevin Rios. Luke and Kevin handled sections 1, 2 and 3, Daniel did with sections 2, 4 and 7, while Christopher did 3, 5, 6.

c) *the* ***implementation and testing document****:* Kevin Rios and Luke Meetre completed the IT document, Kevin and Luke did sections 1-3, and Luke handled sections 4 and 5.

d) the ***source code****:* Luke Meetre added functionality to the front end where the user is able to see the NBA games using an API called “balldontlie” in order to do so. The views for each page have been updated to have a nicer design with a dark theme background with white text. A chat page was also added which currently accepts user input and gives mock responses where we will connect the frontend and backend. Kevin Rios added login authentication and SignUp has been completed using firebase where it stores this information and allows logging in once creating an account. Christopher Tucker focused on aggregating and cleaning NBA player and team data, processing schedule and box score data into CSVs, and preparing structured datasets for training. He also handled merging datasets and calculating matchup-level performance features. Daniel Tribaldos worked on scraping player stats, building the initial data pipeline setup, and creating and training the LSTM-based neural network for stat prediction. He also configured the model’s architecture, handled feature scaling, and scripted the evaluation logic for RNN performance.

e) the ***video***: The members either recorded videos as teams or split into groups in order to describe what was accomplished in this increment. The videos were then spliced into a single video and is linked below.

6) Plans for the next increment

The next increment will be beginning to link the front-end with back-end and allow the interactions between the user and AI. We will also clean up code to make the project look cleaner.

7) Stakeholder Communication

Subject: Progress on Over/Under Prediction for NBA games

Dear Stakeholders,

We are pleased to provide an update on the progress of our AI-Based Over/Under Prediction for NBA Games. Our team has been working on developing and refining the functionality for both backend and frontend development, bringing us closer to delivering a fully functional product.

During this phase, we made significant progress on the front end by implementing features such as displaying current NBA games and creating a chat page that allows user input. We successfully set up login authentication, which enables users to sign up with their email and use those credentials to log in. The login information is securely stored in a Firebase database. Additionally, the front-end design has been updated to improve the user experience.

We also overcame challenges related to API integration, specifically with the balldontlie API, where we had to address CORS restrictions. To resolve this, we developed a proxy-server that handles API requests, allowing the front end to interact smoothly with the API.

On the backend, we were able to start training the AI model, and get far enough to almost begin testing it in the next increment by connecting it with our front end.

Some challenges we encountered included the functionality of the navigation bar, which failed to hide login and signup tabs after successful login. This issue will be addressed in the next increment. Additionally, we worked on making the user interface intuitive and responsive, ensuring a smooth user experience.

In the upcoming phase, we will focus on linking the frontend and backend to enable interaction between users and the AI model. We will also continue improving the code to streamline the project and enhance its performance.

We appreciate your continued support and look forward to updating you on our progress. Please feel free to reach out if you have any questions or feedback.

Best regards,
Group 3

8) Link to video

https://youtu.be/AMdRnrXwjzE