

Progress Report

- Increment 1 -

Group #3

**** Note: Our current, up to date code can be found in the Increment-1 branch of our repository. Main is not up to date, as we believe we have to update it only after Increment-1 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 initial set up and direction for the frontend and backend. We first started by drafting a plan for how we would aggregate the data to train our model. We explored two methods, the first was a Basketball Reference Web Scraper, which is a python tool that extracts specific data from Basketball Reference (our main data source for the project) for the years we want and then puts it into a structure file. We also explored the possibility of using a kaggle dataset that includes significant data ranging from player information to box-scores and play-by-play data. While we did extract some data from the kaggle set, our main source is the web scraper as it's much simpler to run in the context of our program. We also set up our environment with Jupyter Notebook in VS Code and used VS Code liveshare to collaborate in real time on the project. At this point, our dataset has been fully aggregated and ready for training the model as we essentially sifted through and extracted necessary data such as points, rebounds, assists, etc. Finally, we determined our direction and worked the frontend, therefore setting up a number of open issues for Increment 2. This included initializing a new React project, implementing a landing page and client-side routing, as well as creating a login page UI and basic authentication logic for that. We are at a good point for our project, as the group is not only ready to start writing the python script to train our model, but we're also ready to start developing the frontend further from the basic pages that we have coded so far which include the home page, login and signup pages. We haven't changed our project goals compared to the initial scope/functionality. We're still on track to deliver our original aim to make a fully-functioning AI-Based Over/Under Predictor and therefore we are in good standing currently.

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 discussing the front end and making issues for the issue tracker includes: design and how the UI is going to look, how we want to implement login authentication, landing page and what we want a User to be able to see on their end. No changes have been made to our goals compared to the original scope/functionality that we intended on producing. We also had some problems when trying to implement the routing in React, but they weren't detrimental to the progress as we resolved them quickly and efficiently through researching the language.

Back End:

A majority of the backend issues came from properly importing the packages and libraries we needed to correctly access the data. Another issue was with the basketball statistic web scraper, it took some time to figure out which function we needed to call to get the specific data that we actually needed. For example, if we needed to find the average 3 pointers attempted we had to find the exact call that would give us that information

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 1.

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: Daniel Tribaldos, Kevin Rios, and Luke Meetre completed the IT document, Kevin handled sections 1-2, Luke completed section 3, and Daniel handled sections 4-5.

d) the source code: Daniel Tribaldos, Luke Meetre and Christopher Tucker worked on aggregating the data and implementing code for using the Basketball Reference Web Scraper and extracting data from the kaggle sets. Daniel and Chris mainly wrote the source code for getting the correct data for items such as points, rebounds, assists among others which we will use to train the AI. While Daniel focused on figuring out methods to find and extract data from known sources, Chris wrote code to format the data into home and away stats for each team versus every other team (Chris did not sign in during the VS Code Live Share, so the code is included in Daniel's commit). For the source code for the front-end Luke and Kevin added the landing, login and signup pages so that in increment 2 we can continue with its functionality and add authentication for login. Luke set up the file structure and created the React app while Kevin and Luke both wrote source code to implement the HomePage, LoginPage, and SignupPage. It was a collaborative effort in which source code was worked on together in VS Code Live Share for each page at a time, including the three .js files and their corresponding .css files (located in ./styles). The code for Index.js and App.js was also written and worked on collaboratively between Luke and Kevin in order to ensure proper routing between the pages for the frontend.

e) *the video*: Each team (frontend and backend) worked on and recorded a video that described what was accomplished in this increment. The two videos were then spliced into a single video and is linked below.

6) Plans for the next increment

The next increment will be slightly cleaning the data and beginning to think and train our Neural Network model, and the front-end will have a working UI and login authentication to separate users and admins.

7) Stakeholder Communication

Subject: Progress on Over/Under Prediction for NBA games

Dear Stakeholder's,

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 figuring out the functionality and placing the bricks to start working on both backend and frontend development, bringing us closer to moving to getting a functional front and backend done.

During this phase, we successfully aggregated and structured our dataset using a Basketball Reference Web Scraper. This allows us to extract key player statistics efficiently, ensuring that our model is trained on relevant and up-to-date data. We also explored additional datasets from Kaggle, but ultimately decided to proceed with the web scraper due to its seamless integration and ease of use within our system. Additionally, we have set up our development environment using Jupyter Notebook in VS Code, enabling real-time collaboration through Live Share.

On the frontend, we have outlined and started implementation for the structure of the user interface and defined key features, such as the landing page, login authentication, and user dashboard. A React-based project has been initialized, and more advanced implementation for these components will begin in the next phase.

One of the primary challenges we encountered was determining the most effective method for gathering and processing data. After evaluating different approaches, we refined our workflow to prioritize efficiency while maintaining accuracy. Additionally, designing an intuitive and user-friendly interface posed some initial difficulties, as we needed to ensure a seamless experience for both general users and administrators. These challenges have been addressed through structured planning and collaborative decision-making within our team.

In the upcoming phase, we will focus on training our AI model using the compiled dataset. Simultaneously, the frontend development will advance with a working UI and authentication system to support user interaction. These developments will bring us closer to our goal of providing an insightful tool for NBA game predictions.

We appreciate your continued support and look forward to keeping you updated 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/dd-fvF9l1yo>