1. Project Title

        Team AI AI Captain: NBA Historical Season Simulator

2. Describe your project.

        Our app aims to answer the question, "What if the 95-96 Bulls played the 15-16 Warriors?" We want to create a fantasy NBA season simulator to predict how a given team from a specific year will perform against other teams in a different year. This will only account for the regular season, as the playoffs are usually determined through seeding based on performance in the regular season, and combined with playing multiple games back-to-back against each other may also prove more difficult to analyze/predict. We will be using the team stats from the year it came from and compare it against stats from the teams it will be simulated against. The simulation will only run games including the new team keeping the games between other teams with the same outcome. For example, if we want to know how the 95-96 Bulls will perform in the 15-16 season, we will only run games that involve the 95-96 Bulls and keep games with any other teams the same. To run these simulated games, we will use Machine Learning algorithms to create a model for a match that will take in various NBA team/player stats such as FG%, rebounds or assists. To start with we will only allow the simulation using one team, but if we have available time and bandwidth we will try to implement allowing simulating multiple teams.

3. Identify the project members, roles and each member's contribution should be clearly specified for teams.

Yiu-Wah (Leo) Au-Yeung

- Build the machine learning model for the simulation.

- Build the interface (website) where different teams/year will be chosen for the simulation to be run.

Kun Yu

- Build the machine learning model for the simulation.

- Gather and clean up data for different basketball seasons to train the machine learning model.

Dong-Jun (Peter) Lee

- Gather and clean up data for different basketball seasons to train the machine learning model.

- Build the interface (website) where different teams/year will be chosen for the simulation to be run.

Leman Yan

- Build the interface (website) where different teams/year will be chosen for the simulation to be run.

- Build the machine learning model for the simulation.

4. Enumerate the CSCI 350/761 related topics (questions and solution approaches) each individual will contribute to the project.

Constraint Satisfaction - We need to satisfy the constraints of still playing an eight-two (82) game season where the results of the rest of the season remain the same, but our given switched team has a simulated performance

Planning and Knowledge Representation - We will gather data about basketball games and represent it as an object with different data points about the games.

Reasoning under uncertainty - Our entire project will be based on the uncertainty factor of a team playing in a completely different year against different players, so we need to reason how the team will perform against those teams in a parallel situation

Decision Making - We need to decide how to make the decision of whether one team will win or lose against another team when they play each other

Machine Learning Basics - We will train our machine learning model to make predictions using data (NBA statistics).

5. Describe what you plan to demo on the final exam date and other deliverables.

We will be making a website where a user is able to swap out a team with another team from another season and then run a simulation. The simulation will return the results of the simulation. The user will be able to see how well their swapped team performs against the other teams of that season. We will also have the data of the simulated games in hand so that we can take a deeper look at how the team is predicted to perform against other teams to result in the given predicted standing.

6. Describe your plan to evaluate the project.

To evaluate the project, we will run a simulation of a season without any modifications. After running the simulation, we can compare the results of the simulation and the results of the real season. The simulation should be as accurate as possible to the actual results of the season.