1. Provide an example of five hypothetical non-functional requirements for this system. Be sure to include the specific type of requirement discussed in class, with each requirement coming from a unique category.

Performance: the bot should be able to relatively quickly give accurate responses

Reliability: the bot should be able to serve multiple requests and many people at the same time all the time

Usability: it should have an easy-to-use interface without much technical setup needed from the user

Supportability: the bot should be able to be easily updated with new players or if players switch teams

Constraints: should be able to run on any device

2. Provide an example of five hypothetical functional requirements for this system.

Predicts sports betting outcomes with decent accuracy. `

Allows for the input of data.

Frontend to easily see results.

A backend that efficiently processes data.

The program should be able to ignore or get rid of bad data.

3. Think of a specific task required to complete each of the functional requirements and non-functional requirements mentioned above (10 total). Estimate the amount of effort needed to complete this task using function points (i.e., using the values here). Briefly explain your answer. (1 low → 10 High)

1. To ensure performance we need to test the response time of requests -2
2. To ensure reliability we would need to test the service while many people are using it-8
3. To ensure usability we would have to let lots of people use the app and then get their feedback on what to improve -4
4. To test usability, we should add and remove players and then see if the data it produces is still accurate -5
5. To ensure that it adheres to the constraints, we should run the program on different types of devices - 7
6. For the accuracy we need to test the expected outcome to the actual - 8
7. A frontend would be necessary to take an input for the project that can move the data to the backend for processing. - 5
8. The frontend needs to be built with special design considerations to make sure it fits in with the project theme. - 6
9. The backend needs to be able to defend against bad input - 8
10. If bad data is present, the program needs to output telling the user that the data needs to be fixed/changed - 5

4. Write three user stories from the perspective of at least two different actors. Provide the acceptance criteria for these stories.

1. Actor: Raptor University, Florida, Football Coach

Name: Steven Michaelson
Experience: 8 Years (Sr. Coach)
I've used a lot of means to track my players. From counting yards to maintaining 2nd down conversions, it is key to keep a track of everyone, including your opponents. All this data exists, but we need a way to manage and process this data. Any functional processed data could make a difference in a game. This creates a space and need for development.

2. Actor: NBA Basketball Player

Name: Joe Russoi
Experience: 15 year Pro
A basketball player and this bot would help them if they can see who might perform the best or worst for a single night. If they can see who might score higher or lower they can base their defense around that. Someone like this might not even need to use the bot to try and make money but to analyze another team.

3. Actor: Sports analyst/Betting coach

Name: Giovanni Giorgio
Experience: 2 years
Someone who is active in sports betting and talks about their picks often could benefit from being able to use a sports betting bot to help them with their picks. They could also make their predictions faster because they would need less research if they can rely more on the bot.

5. Provide two examples of risk that could potentially impact this project. Explain how you would mitigate these risks if you were implementing your project as a software system.

One potential problem with this system is data collection and processing, although data is abundant and could be easily accessed, this data needs to be processed and updated regularly. Sports bots need to be updated with the latest stats. We could mitigate this risk by updating data using an automated process. Google offers APIs where we could fetch live sports updates from.

One potential problem we may have is the insertion of malicious data into the program which will skew results by messing up the algorithm used to make predictions. We have to ensure that the data that is used by the system or the prediction model itself cannot be tampered with.

6. Describe which process your team would use for requirements elicitation from clients or customers, and explain why.

For our sports analytics bot project, the Agile methodology particularly Scrum would be the most suitable, and here are some of the reasons why we will choose it -

- Frequent feedback and adaptability
- Collaborative environment
- Flexibility in changing requirements
- Faster time to market
- Transparency and client involvement
- Prioritization of work

Requirements Analysis:

1. **Use Case:** Analyze Player Statistics
   Actor: Team Manager
   It is the offseason and I am looking for free agents to sign to the team. I will use this app to determine if this player will fit well with the types of plays this team runs, and if he will be effective in the role he will play. I can use the app to determine his stats for the season, and it can even give me insights into the weaknesses and strengths of the player.
   a. The user opens the app
   b. The user can ask about a specific stat or get all of the important stats about the player's position or sport if it is a solos sport
   c. The user can view all stats and it will be displayed if the player is above or below average in those stats
      i. Method to get previous stats
      ii. Feed previous stats into predictive model
      iii. Method to get player stats prediction
      iv. Method to get the average of all players
      v. Method to compare the values
      vi. display the comparisons

2. **Use Case:** Predict Player Performance
   Actor: Fan
   As a fan there may be ways to interact with the games, one of them is gambling. Fans often keep track of players and their plays and use them to stay up to date. A product like this is important to highlight available statistics to present and to provide with the right form of data to make accurate predictions and placements. By knowing that their favorite player will score a 35 point game, the fan can make predictions based on these circumstances.

a) Open Application
b) Select the Search bar
c) Enter Player name
    i) Select player
    ii) Select game
d) A view of the condensed data table appears
e) Specific scores, such as
    i) FG%,
    ii) 3-Pt%
    iii) 2-Pt%
    iv) game history
    v) 10+Pt, 20+Pt…. Predictions.
    vi) Against history
    vii) Home and Away
f) Filters to enable the fan to check specific data.
g) Sort to sort the data by year, team, and score
h) Option to enter custom score range to get % prediction

3. **Use Case:** Compare Player Performance
   Actor: Analyst
   As a sports Analyst it is important for me to make predictions and compare how different players are performing day-to-day. With the app I will look at how two players are playing and can get an easy side-by-side view of how those players are performing.
    a. Analyst opens the app
    b. The Analyst then thinks about two star players he would like to compare and enters them into the app.
    c. The app then gathers the data for those players and presents them side by side for the Analyst.
    d. The Analyst then makes his argument for the day and uses the data that he gathered to back his claims.

4. **Use Case:** Generate Team Performance Report
   Actor: Coach
   As the coach of a college basketball team it is crucial to understand how the team is performing. If I see a player that isn't performing well and is predicted to not improve, I might need to give another player a chance to improve and show their skills.

    a. Coach opens up application
    b. Coach chooses the players on his team to analyze their stats
    c. App shows all basic and advanced stats of the players he selected
    d. Additionally the app shows the trends of the players

e. Coach sees that one of his starters has not been performing well and is projected to keep declining.
f. Coach makes the decision to let one of his bench players have a chance to show their skills.

5. **Use Case:** Update Player Statistics
   Actor: Administrator
   As one of the administrators of the application I am in charge of managing the way player statistics are updated. I need to make sure that I am gathering data from different sport sources to keep the app up to date with current stats.

   a. Sports athletes play their games
   b. Workers at those games update stats in real time
   c. Administrator opens app to create script to update stats of players.
   d. Script takes updated stats in real time.
   e. Model learns on the updated stats after the stats are finalized.
   f. All users of the apps can now see the updated changes

Process Deliverable: Scrum Meeting Notes (Date: 03/10/2024)

1) **Karan:**
   a) We decide on agile development in the early stages. To fit with that we will start working on the software.
   b) We agreed on the common features, such as stats projection.
   c) Two interfaces one for fans and players and other for certified coaches.
   d) We also agreed on data collection techniques.
   e) The source for the data will be official websites such as ESPN or ACC.
2) **Aneesh:**
   a. We have already determined the requirements for the project
   b. We are discussing which programming languages and predictive models to use
   c. We still need to determine how we are going to design the system for the project.
3) **Aidan:**
   a. We are looking into how we can break down the user cases into smaller more manageable tasks that we can implement.
   b. We are also looking into the best way to gather the data for the app to use and learn from.
   c. Additionally, we are looking into the best framework that would allow us to accomplish this project.
4) **Soham:**

a. **We are researching into frameworks and tools that can help us build the ML engine.**
b. **We are looking forward to requirements gathering and information collection needed to kickstart the implementation process.**
c. **We have decided on software methodologies and the timeliness for the project in order to execute on time.**