You've been tasked with answering one of the most hotly debated questions in sports: **Who is the Greatest of All Time (GOAT)?**

But instead of relying on hot takes or highlight reels, you will use descriptive statistics and modeling to make a data-driven argument. You are provided with two datasets (`PSL2_NFL QB Stats.xlsx` and `PSL2_NBA Player Stats.xlsx`) and will choose one to analyze. Your goal is to define what "greatness" means in your chosen context, build a model using measures of relative standing, and identify which athlete best fits that model.

Work through the following problems, answering them on this sheet or in your Excel file. You will submit a memorandum formatted in accordance with AR 25-50 *Preparing and Managing Correspondence* to your instructor via Canvas no later than **10 2359 September 2025**. In your memo you should provide a brief background or purpose for the memo and your answer to the question, who is the GOAT? Your answer should be written to a non-technical audience, but should communicate how you conducted your analysis and why you came to the conclusion you did. The memo will be no more than one page long. **Professionally formatted charts will be included as an enclosure to your memo.** This worksheet will also be scanned and included with your memorandum as a second enclosure.

Part 1. Before you open Excel.

1. Select one of the datasets (NFL QB stats or NBA player stats). Thinking about the sport you chose, what does it mean to be the "GOAT" (Greatest of All Time)? Is it about performance, consistency, dominance over peers, or something else? Take a minute to write down your own definition: What characteristics would make an athlete in your selected sport the greatest?

2. Using the incomplete data dictionaries in Tables 1 and 2 at the end of this PSL, identify 4–5 variables that you believe are important for determining GOAT status. For each one:

   - Write the variable name its definition.
   - Explain why you chose it
   - Identify its data type (e.g., numerical - continuous or discrete; or, categorical - ordinal, nominal, or binary)
   - Indicate whether a higher or lower value is better

3. Based on your answers above, write a few sentences summarizing your key modeling decisions or assumptions. You should consider:

   - Which statistic matters most for determining greatness? Is there just one?
   - Whether outliers represent greatness or are likely just noise or errors?
   - How you will evaluate greatness (using a composite score, dominance in a single category, consistency across multiple stats, or another method)?

   Be sure to explain *why* your modeling decisions are reasonable and necessary for answering the GOAT question.

Part 2. Calculate Relative Standing

4. For each of your selected variables, calculate the mean and standard deviation. Then compute the z-scores for every player in the dataset. Write the top three players for every variable below.

5. Using the z-scores you calculated and your selected measure of greatness (see Problem 3), who is the GOAT and why?

6. Create one meaningful visualization that supports your argument. Include this as an enclosure in your memo.

7. Find someone who analyzed the other sport. Share your findings. Based on the data and methods each of you used, decide: Who is the ULTIMATE GOAT? Meaning which athlete stands out the most relative to their peers? Compare how dominant each athlete is in the respective context. Identify who is the most dominant and explain your reasoning.

8. What are some limitations of your analysis?

9. If someone else chose a different measure of greatness, would they potentially get a different GOAT? What does that tell us about modeling decisions?

Generative AI tools like ChatGPT can be great for breaking down ideas like "what is a z-score?" or "how do I standardize variables in Excel?"

Do not ask AI to "tell me who the GOAT is" or "what are the limitations for this problem." It's your job to think through these ideas. However, you may ask generative AI to help clarify or explain concepts.

Cite any help you receive in your Acknowledgment of Assistance IAW the DAAW.

Table 1: Data Dictionary for NFL Quarterback Statistics

Variable Name	**Description of Variable**
Pass Yds	Yards Gained with Successful Throws
Yds/Att	Yards Gained Per Throwing Attempt
Att	Throwing Attempts
Cmp	Completed Throws
Cmp%	Percentage of Throws that are Successful
TD	Throws that lead to Touchdowns
INT	Throws that are Intercepted
Rate	Quarterback Rating
1st	Throws that Lead to First Downs
1st%	Percentage of Throws That are First Downs
20+	Throws Starting From at Least the 20 Yard Line
40+	Throws Starting From at Least the 40 Yard Line
Lng	Most Amount of Yards Gained From a Single Throw
Sck	Sacks
SckY	Sack Yardage

Table 2: Data Dictionary for NBA Player Statistics

Variable Name	**Description of Variable**
player_name	Name of the player
team_abbreviation	Abbreviated name of the team the player played for (at the end of the season)
age	Age of the player
player_height	Height of the player (in centimeters)
player_weight	Weight of the player (in kilograms)
college	Name of the college the player attended
country	Name of the country the player was born in (not necessarily the nationality)
draft_year	The year the player was drafted
draft_round	The draft round the player was picked
draft_number	The number at which the player was picked in his draft round
gp	Games played throughout the season
pts	Average number of points scored
reb	Average number of rebounds grabbed
ast	Average number of assists distributed
net_rating	Team's point differential per 100 possessions while the player is on the court
oreb_pct	Percentage of available offensive rebounds the player grabbed while he was on the floor
dreb_pct	Percentage of available defensive rebounds the player grabbed while he was on the floor
usg_pct	Percentage of team plays used by the player while he was on the floor
ts_pct	Measure of the player's shooting efficiency that takes into account free throws, 2 and 3 point shots
ast_pct	Percentage of teammate field goals the player assisted while he was on the floor
season	NBA season