

## DATA 400 Mini-Project Idea

**Title:** *Do NBA Back-to-Back Games Hurt Performance?*

### 1. Research Question

Do NBA players (or a selected team) perform worse in games played on back-to-back days compared to games with at least one day of rest?

### 2. Motivation

Professional athletes often face fatigue when playing multiple games in short succession. This project explores whether there is measurable evidence of reduced performance on **back-to-back games (B2B)**. The findings could contribute to discussions around scheduling fairness, player rest management, and sports analytics.

### 3. Data Collection

- **Source:** Basketball-Reference.com (game logs for the 2024–25 season).
- **Method:** Web scraping with `pandas.read_html` and/or `BeautifulSoup`.
- **Scope:**
  - Option 1: Entire season for one team (e.g., Philadelphia 76ers).
  - Option 2: Game logs for 3 - 5 key players (starters) to keep scope manageable.
- **Variables:** Date, opponent, location (home/away), points scored, field goal %, minutes played, turnovers, rebounds, etc.

Feature engineering:

- `rest_days` = difference in days since last game.
- `is_b2b` = True if `rest_days` = 0.

### 4. Planned Analysis

#### 1. Exploratory Data Analysis (required):

- Compare average points, efficiency, and turnovers on B2B vs. non-B2B games.
- Visualize differences with boxplots, histograms, and bar charts of averages.

#### 2. Optional Model:

- Simple logistic regression or random forest predicting “above/below season-average performance” using `is_b2b`, `home/away`, and opponent win rate.

#### 3. Interpretation:

- Identify whether fatigue shows up statistically.
- Discuss limitations: small sample size, confounders (injuries, opponent quality).

## **5. Ethical Considerations**

- Credit the data source.
- Emphasize that findings are descriptive, not prescriptive - many factors affect athlete performance beyond schedule.

## **6. Expected Deliverables**

- Tidy dataset (CSV).
- 3 - 4 visualizations comparing B2B vs. non-B2B performance (charts)
- 3 - 5 key bullet-point insights.
- Short presentation slides (6–8) summarizing question, data, visuals, and conclusions.