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STA 230

Justification for A-Level Difficulty - NBA Shots Tracker Project

We are writing to justify the A-level difficulty of our undergraduate statistics project, "NBA Shots Tracker. Below, we outline how our project meets the criteria for an A-level project, as defined in the course syllabus.

Extensive Data Manipulation

Our project required substantial manipulation of a complex and voluminous dataset. Utilizing libraries such as tidyr, dplyr, stringr, and lubridate, we managed and processed over 5 million shot records and data on 4900 NBA players. This involved intricate data cleaning, transformation, merging, and joining operations. Our code demonstrates extensive use of multiple distinct functions/methods, showcasing our proficiency in handling and preparing large-scale, real-world datasets.

Professional Quality Visualizations

We focused on creating thoughtfully constructed, professional-quality visualizations. A notable feature of our project is the innovative use of an NBA court image as the background for our shot charts. This design choice, coupled with customized labels, colors, and design elements using ggplot2 and plotly, not only enhances the data's readability but also provides a contextual and intuitive understanding of the shots' spatial distribution so the user can visualize where the players shoot from based on their extensive data.

Great Functionality

Our application offers significant functionality beyond basic filtering or variable selection. It enables interactive and dynamic analysis, allowing users to explore the data across various dimensions such as players, seasons, shot zones, distance from basket, and other outcomes. This level of interactivity and customization offers novel insights and a user-centric analytical experience, demonstrating a sophisticated application design.

Code Efficiency

The project code is structured for legibility and efficiency. We employed reactive programming paradigms in Shiny, along with modular function design, to ensure our application is robust and maintainable. This approach not only enhances the app's performance but also illustrates our commitment to writing clean, efficient, and professional-grade code.

Self-Study and Beyond Class Scope

A key aspect of our project was the self-initiated use of an open-source web scraper in Ruby on Rails to collate shot location data, which was not readily available in a standard format. This required extensive self-study and adaptation of new technologies beyond the classroom teachings. Additionally, we employed a PostgreSQL database for efficient data delivery to our R Shiny app, handling an extensive dataset that far exceeded the class's typical scope.

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Conclusion
In summary, our project "NBA Shots Tracker" demonstrates extensive data manipulation, professional-level visualization, advanced functionality, efficient coding, and a significant degree of self-study and innovation. These aspects align closely with the hallmarks of an A-level project as outlined in the course syllabus, and therefore, I believe our project merits this distinction.