F1 TEAM PERFORMANCE TRACKER

MILESTONE: PROJECT PROPOSAL

GROUP 14

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Title of the project: F1 Team Performance Tracker

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Formula 1 or F1, is one of the most popular and competitive motorsports globally. All through the season, the fans, teams, and drivers keep a careful eye on performance indicators and standings in F1. However, managing and analyzing such a vast amount of data - such as team statistics, driver performance, race results, lap times and standings- requires a robust system.

This project proposes building an F1 Team Performance Tracker, a database management system (DBMS) designed to store, track, and analyze performance data related to Formula 1 teams, drivers, circuits, and races. The system will enable users to monitor race performance, view historical data and analyze trends in team and driver results over different seasons.

Project Objectives

- **Data Management**: Create a structured database that efficiently stores the data of all the drivers, teams, races, seasons, circuits and standing across different seasons.
- **Performance tracking**: Track individual driver and team performance over time, allowing the users to view the results of specific races, laps, and seasons.
- **Trend Analysis:** Provide tools for analyzing the trends in the team and driver performance, such as improvement in performance and consistency during specific races.
- **Comprehensive Results**: Store detailed results of each race, including lap times, finishing positions, points earned and other key metrics.
- **Historic Data:** Allow users to access historical data about F1 seasons, such as past championships, race winners and fastest laps.

Scope of work and theory

The F1 team performance tracker is a comprehensive database management system aimed at monitoring and analyzing Formula 1 teams and driver performance over multiple seasons. The key tables involved are Teams, Drivers, Circuits, Races, Results, Seasons and Standings, each serving a distinct role in capturing and organizing data.

- The teams table stores the details such as team names, principals, engine suppliers, and championships won, while the Drivers table contains personal data like driver name, nationality, team affiliation, and performance records.
- The races table captures race-specific data like location, circuit, and date, while the Results table tracks individual driver performances, including finishing positions and fastest lap times.
- The circuits table holds data on track locations and characteristics, and the Standings table tracks driver and team ranking for each race and season.

Relationships between these entities allow for complex queries and analysis, such as tracking individual driver performance over time, team rankings across seasons, and trends in circuit performance. For instance, each driver is tied to a team, each race to a circuit performance, and each result to both driver (or the team) and race. The seasons tables enable historical comparisons of team and driver standings across multiple years. Using SQL queries specific data can be retrieved, such as race results or driver statistics. Generate reports for analysis, like team performance over a season or past race results.

The system's scope covers the entire process from database design, data population, and query development to advanced trend analysis and data visualization (optional from the subject perspective), providing insights into performance patterns and race outcomes. This tool will enable F1 analysts, teams, and fans to conduct in-depth performance reviews, monitor real-time race statistics, and analyze season-wide trends. The focus will be on delivering a scalable, high-performance database with capabilities for detailed race analysis and reporting.

Key objectives include building a relational database with efficient querying, ensuring scalability as new seasons and races are added, normalizing data to reduce redundancy, ensuring efficient storage and consistency and optional integration with visualization tools like Tableau or Power BI to present trends and performance insights. The system will support both historical data analysis and real-time race performance tracking.