

Data Analytics with R - Term Project plagiarism 27 March

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Formula 1 as an auto sport is growing very rapidly in North America as well as in Asia due to the very popular Netflix series "Drive to survive" which is packed with thrill and stories. In the context of Formula One, F1 refers to the highest level of international single-seater auto racing. The F1 World Championship is governed by the Fédération Internationale de l'Automobile (FIA) and is known for its high-speed races, advanced technology, and skilled drivers. According to Tanaka et al, the teams that will be competing are called "Constructors" to determine which driver is the fastest to win the driver's championship since 1950 and which constructor is fastest to win the constructor championship since 1958. The main role of constructor is to manufacture the car, engine within a set of rules to make the fastest car.

According to Fields et al, aerodynamics play a crucial role in the performance of Formula 1 racecars. The paper highlights how advancements in aerodynamics have allowed F1 teams to improve their lap times, increase speed and stability, and enhance overall vehicle handling. The author also discusses how F1 regulations have evolved to limit certain aerodynamic technologies in an effort to level the playing field and promote competitive racing.

Engine is one of the most important parts of the car, it is the heart of the car. In the paper According to Alten et al, the authors discuss the specific demands placed on Formula One engines and the strategies used to develop them. The paper highlights how F1 engines must be lightweight, powerful, and reliable, while also complying with strict regulations on fuel efficiency and emissions. The authors discuss the evolution of F1 engines over time, including the shift from naturally aspirated engines to turbocharged hybrids, and how teams have employed various development strategies to optimize engine performance. The paper also touches on the role of engine suppliers and the challenges they face in meeting the demands of F1 teams.

Tyres is another important component which is responsible for the movement of the vehicle, According to the Pirelli website, tires play a crucial role in the performance of Formula One cars. There are three main types of tires used in F1: slicks, intermediates, and wets. Slicks are used in dry conditions and have no grooves, providing maximum grip on the track. Intermediates are used in light rain or damp conditions and have shallow grooves to improve traction. Wets are used in heavy rain and have deep grooves to channel water away from the tire, reducing the risk of aquaplaning. The teams must manage their tires carefully throughout the weekend, selecting the right type of tire for the conditions and balancing the need for speed with the need to preserve the tires for the duration of the race. Tire management can often be a key factor in determining the outcome of an F1 race.

The reason it is important to describe about aerodynamics, engines and tires is because these factors collectively play a major role in getting the fastest lap times around the circuit. According to Modoni et al, telemetry is described as a critical component of Formula One racing. Telemetry refers to the process of transmitting data from the car to the team's engineers in real-time during a race. This data includes information on the car's speed, engine RPM, tire temperature, fuel consumption, and other key performance indicators.

The data collected through telemetry is used by the team's engineers to monitor the car's performance and make adjustments in real-time to optimize performance. Telemetry also allows engineers to diagnose potential issues with the car and make informed decisions about when to make pit stops or other strategic moves during the race. In addition to its use during races, telemetry data is also used by F1 teams to improve car performance during testing and development.

In the world of motorsports, there is a need for an app that can display real-time laptimes and telemetry data. The current apps available in the market often lack the necessary features or have certain limitations that can make them less useful for drivers and teams.

For example, some apps have a limited range of telemetry data that can be displayed, making it difficult for teams to monitor all of the important performance indicators. Other apps may not provide real-time updates or have a delay in updating the data, which can cause issues in making timely decisions during a race. Some apps may also be difficult to use, with confusing interfaces or limited functionality.

An app that can display laptimes and telemetry data in real-time would be incredibly useful for drivers and teams. It would allow them to make informed decisions about car performance, identify issues early on, and make necessary adjustments in real-time. Additionally, an app could provide a more user-friendly and customizable interface, allowing teams to view only the data that is most important to them.

One example of the need for such an app can be seen in the 2019 Brazilian Grand Prix, where Max Verstappen's team lost telemetry data during the race. This made it difficult for the team to monitor the car's performance and make necessary adjustments, ultimately leading to Verstappen's retirement from the race.

Another example can be seen in the 2020 Styrian Grand Prix, where a timing system issue caused the display of incorrect laptimes. This confusion caused issues in race strategy and made it difficult for teams to accurately assess the performance of their cars.

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