**F1 Data Analysis Project Summary**

**1. Monaco 2024 - Pace Comparison Between Hamilton and Russell in Qualifying**

In the Monaco 2024 Grand Prix, a detailed pace comparison was conducted between Lewis Hamilton and George Russell during the qualifying sessions. The analysis focused on identifying the specific segments of the track where Hamilton lost time compared to Russell. By examining the lap times, speed data, and sector splits, key insights were drawn about their performance discrepancies, pinpointing exact corners and straights where Hamilton's pace was compromised.

**2. Canada 2024 - Ideal Lap Analysis and Long Run Pace**

The Canadian Grand Prix analysis included several comprehensive components:

* **Ideal Lap Analysis:** By combining the best sector times from each driver, the ideal lap for the session was constructed. This provided a benchmark to assess each driver's potential performance had they perfectly optimized each sector in a single lap.
* **Long Run Pace in Friday Practice Sessions:** The analysis of the long run pace during the Friday practice sessions provided insights into the performance consistency and tire degradation over extended runs. This data is crucial for understanding race strategy and potential outcomes.
* **Top Speeds and Drag vs Downforce Trade-Off:** Each constructor's top speeds were analysed to understand the trade-off between drag and downforce. This comparison highlighted the aerodynamic efficiencies and compromises each team made, offering a deeper understanding of their design philosophies and race setups.
* **Saturday Qualifying Analysis:** A focused analysis on the Saturday qualifying sessions was performed to examine the drivers' performances, strategies, and how they managed track conditions and traffic.

**3. Spanish GP - Practice and Qualifying Analysis**

The Spanish Grand Prix analysis included various performance aspects:

* **FP1 Long Run Pace Analysis:** Evaluated the performance consistency and tire degradation over extended runs in FP1 to understand race strategies.
* **FP2 Qualifying Pace Analysis:** Analysed the drivers' one-lap performance during FP2 to gauge their qualifying potential.
* **FP2 Long Run Analysis:** Further assessed long run pace during FP2 for a comprehensive understanding of race preparations.
* **Top Speeds in FP1 and FP2:** Compared top speeds in both practice sessions to evaluate aerodynamic performance and efficiency.
* **Qualifying Top Speed Analysis:** Examined top speeds during qualifying to understand the balance between drag reduction and downforce optimization.

This project not only delved into specific driver comparisons and ideal performance scenarios but also provided a broader view of the strategic elements that influence race outcomes in Formula 1.