Analyzing Trends in Collisions and Overtake on F1 Circuits to Determine Areas of Improvement

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Q1: Research Question

- F1 regulations hinder technological advancements due to safety concerns, such as collisions.
- Where can tracks be improved based on overtake and collision activity?
- Experimental hypothesis: If trends of crashes and overtakes on F1 race circuits can be identified, then necessary areas of improvement can be found.

Q2: Methodology

1) Obtain 2023 F1 Season footage from F1 Database
2) Analyze First lap, placements, and positions gained/lost.
3) Using Excel, document collisions and overtakes second by second at each POI as outlined by official track maps.
4) Analyze visual and using commentary for collision or overtake data.
5) Repeat for 2023 races
6) Derive Averages for overtakes and collisions by individual sectors.

Q3: Data Analysis and Results

- Data supported the hypothesis of areas of improvement being found through analyzing overtake and collisions.
- Sector One averaged significantly more overtakes throughout all races, 16.9 as opposed to 5.6 and 1.8.
- Sector 1 consistently showed a trend of more collisions and overtakes per race. 7:1 ratio in collisions between Sector One and Sector Two and Three combined.

Q4: Interpretation and Conclusion

- Based on data and trends, Sector One is primary area of improvement.
- Sector 1 had both more collisions and overtakes comparatively, with only 2 slight outliers.
- Although every track and its POI's are different, Sector One is the most eventful.
- Future research will account for track conditions, driver speed, POI characteristics, and G-forces to better find areas of improvement and find improvements to track and tires.
- Gathering a larger pool of data is crucial.