CS 451 Final Project

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Contents

1 Cover Page

- **Author:** Zane Globus-O'Harra
- **Project Title:** Formula 1 Database
- **Connection Information**
  - **Port Number:** 3372
  - **Host Name:** ix
  - **Guest Account Login & Password:**
    login: guest
    password: guest
  - **Database Name:** f1db
- **Project URL:** `https://ix.cs.uoregon.edu/~zfg/f1db/main.html`
- **Highlights:** TODO

2 Summary

2.1 High Level Overview

The world that will be modeled will be a simplified version of a Formula 1 (F1) car-racing season. This will include the drivers, the teams the drivers are in, the races, and the results of those races.

2.2 Kinds of Data

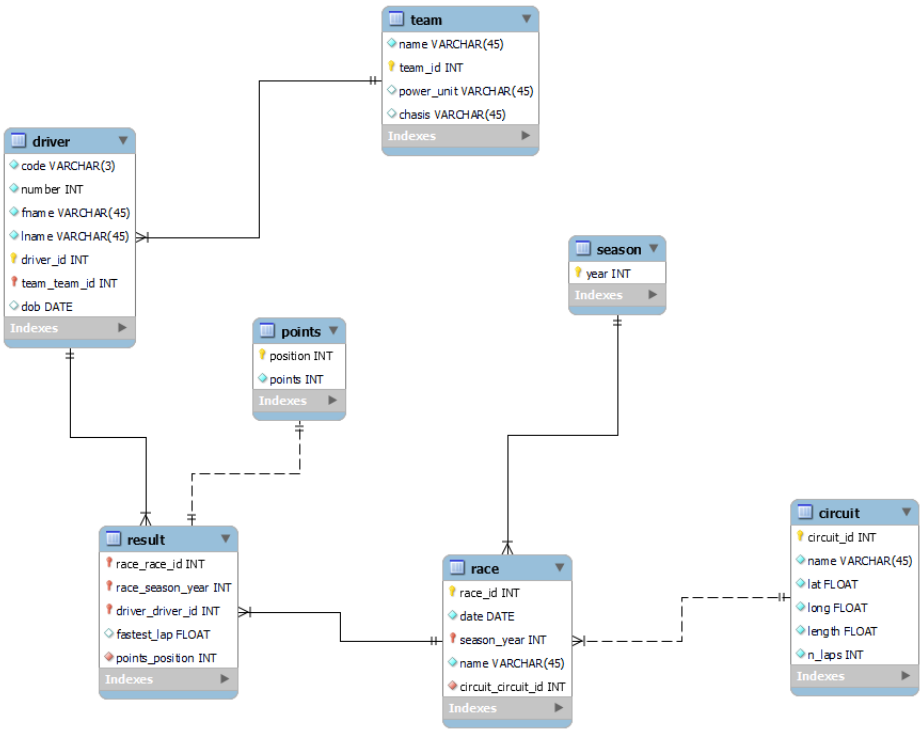
The kinds of data that will be stored will be about the drivers, the teams, and the results that those drivers receive in the races that they participate in. I'm not sure how in-depth you want me to go when discussing kinds of data, but I think that the high level overview and the ER diagram in the Logical Design section make it fairly clear the kinds of data that I will be keeping track of.

2.3 Application Programs

The application programs that are desired are a way to summarize the results in a season, and determine who was the champion for that season. I also want to look at the average results of each driver, and give a summary of their best and worst races in a season (if I add data for multiple seasons, then I will also be able to look at their results across their career).

Each team will have two drivers, and I will have a way to compare the drivers of one team. I will also have a way to look at the results of a team over a season (the team's results is the sum of the results of its drivers), and the results of that team over its tenure in F1.

3 Logical Design



4 Physical Design

Table names are in **bold and CAPITALIZED**, primary keys are underlined, and foreign keys are *italicized*. If an attribute is a primary key and a foreign key, then it is *underlined and italicized*. Not null requirements are indicated. Primary keys and foreign keys are always not null.

- **TEAM**: team_id, name, power_unit, chasis
  - not null: power_unit, chasis
- **DRIVER**: driver_id, *team_team_id*, code, number, fname, lname, dob
  - not null: code, number, fname, lname
- **RESULT**: *race_race_id*, *race_season_year*, *driver_driver_id*, *points_position*, fastest_lap
- **POINTS**: position, points

  - not null: points

- **RACE**: race_id, *season_year*, *circuit_circuit_id*, date, name
  - not null: date, name
- **SEASON**: year
- **CIRCUIT**: circuit_id, name, lat, long, length, n_laps
  - not null: name, lat, long, length, n_laps

5 List of Applications

(1) input: driver, season

output: A single driver's race results across that season

(2) input: season

output: summary of the all driver's results across that season

(3) input: season

output: summary of the team (constructor) results of that season

(4) input: driver, season

output: average results of that driver across that season

(5) input: team, season

output: for each race in that season, compare the results of the drivers in that team

(6) input: race, season

output: summary of the driver's results from that one race in that season

(7) input: race, season

output: summary of the team's results from that race in that season

(8) input: season

output: summary of the races in that season (race name, circuit name, circuit length, number of laps, etc.)

6 User's Guide

6.1 Basic Overview

Each "application" is fairly straightforward to use. Most of the applications display some variation of the results over a season. Seasons are determined by the year, and the only season that has data is 2021. However, the complete data for every race and every result has been entered for the 2021 F1 season, so every query for that season should return a fairly "well-stocked" set of results.

The other fields are fairly picky about what is entered. If a field asks for a "Race," it wants that race's full name. The available races are:

- Bahrain Grand Prix
- Emilia Romagna Grand Prix
- Portugese Grand Prix
- Spanish Grand Prix
- Monaco Grand Prix
- Azerbaijan Grand Prix
- French Grand Prix
- Styrian Grand Prix
- Austrian Grand Prix
- British Grand Prix
- Hungarian Grand Prix
- Belgian Grand Prix
- Dutch Grand Prix
- Italian Grand Prix
- Russian Grand Prix
- Turkish Grand Prix
- United States Grand Prix
- Mexico City Grand Prix
- Sao Paulo Grand Prix
- Qatar Grand Prix
- Saudi Arabian Grand Prix
- Abu Dhabi Grand Prix

The same goes for drivers, whose last names are:

- Raikkonen
- Giovinazzi
- Gasly
- Tsunoda
- Alonso
- Ocon
- Vettel
- Stroll
- Leclerc
- Sainz
- Mazepin
- Schumacher
- Ricciardo
- Norris
- Hamilton
- Bottas
- Perez
- Verstappen
- Latifi
- Russell
- Kubica

And lastly, the same goes for the teams:

- Mercedes-AMG Petronas F1 Team
- Red Bull Racing Honda
- Scuderia Ferrari
- McLaren F1 Team
- Aston Martin Cognizant F1 Team
- Alpine F1 Team
- Alfa Romeo Racing Orlen
- Scuderia AlphaTauri Honda
- Haas F1 Team
- Williams Racing

6.2 Examples of Each Application

Examples for each app are as follows:

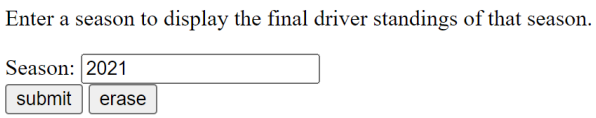


Figure 1: This app displays the final driver standings of a season, by summing up the points that each driver has earned over the season and ordering the drivers based on total points earned.

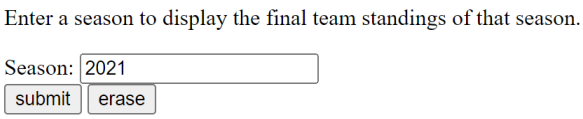


Figure 2: This app displays the final team standings of a season, by summing up the points that each team has earned over the season and ordering the team based on total points earned. Because each team has two drivers, the points that a team earns in a race is the sum of the points of the drivers of that team.

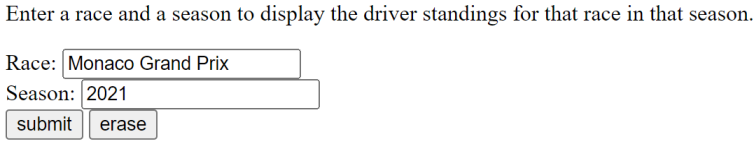


Figure 3: This app displays the driver standings after a race, showing their name, the position they finished in, and the points that they earned.

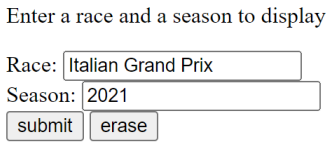


Figure 4: This app displays the team standings after a race, showing their name, the position they finished in, and the points that they earned. The teams finishing position is determined by the points that the drivers of that team earned.

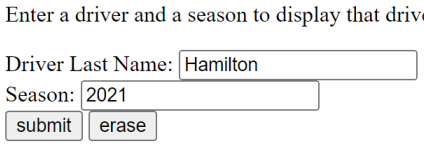


Figure 5: This app displays, in chronological order across a season, the race results of one driver as well as the points that that driver earned.

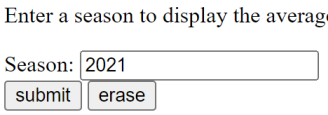


Figure 6: This app displays the average position per race and average points per race for every driver in a season, ordered from the highest average points to the lowest.

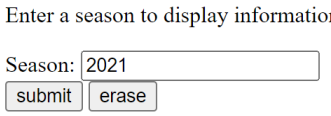


Figure 7: This app displays information about every race that occurs in a season, including the race name, the circuit at which the race takes place, the date of the race, the length of the circuit, the number of laps, and the total length of the race. The results are ordered chronologically by race date.

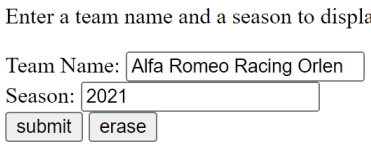


Figure 8: This app displays the two drivers in a team, mainly to compare the number of points that each driver has earned, but also showing their driver codes, their number, and the number of races they have completed. If a needed a replacement driver for some races during the season, that is displayed here (as is the case with Alfa Romeo).

7 Contents of the Tables

The contents of the tables can be found by clicking on the link to the table contents from the main project URL, or by going directly to:
`https://ix.cs.uoregon.edu/~zfg/f1db/tables.html`

8 Implementation Code

The implementation code for the main website can be found via a link at the bottom of the main project webpage. The code for each PHP app can be found via a link below each submission form. The link to the main website is repeated here:
`https://ix.cs.uoregon.edu/~zfg/f1db/main.html`

9 Conclusion

TODO