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URL to Step 5 Website

http://flip2.engr.oregonstate.edu:60368/

Executive Summary

- Initially when we came up with the outline for our database we did not have an intersection table in our ER diagram for our M:M relationship between Grand Prix and teams. After we got feedback from our peers, we added an intersection table called Grand_Prix_has_Teams which tracks which teams entered a given race. This allows us to satisfy the requirement for the M:M relationship.
- Part way through the project we realized that we had a major issue in that many of our entities had whitespaces in their titles. While this wasn't too much of an issue while working within MySQL, it became a real challenge once we got to Step 4 and had to start integrating HTML and JS to interact with our database. While we were generally able to use the backticks to surround an entity name in MySQL (Grand Prix would become `Grand Prix` when used in a query) it became difficult to enter table names into JS. We made the decision to go back into our data definition query file and rename all tables that had whitespace in their names to use underscores instead. For example "Grand Prix" became "Grand_Prix". This made it so much easier to enter these values into our files.
- We got some feedback during Step 3 that we should ensure that we have nullable fields in our tables. We wanted to ensure that not only did we have a Foreign Key that we could make nullable, we could also make regular attributes nullable. We decided to change the lifeimte_points, lifeimte_wins, and lifetime_poles values in the Drivers table so that they could be set to null. We decided to use these attributes because in real life a driver could have nothing for those values and it still gets the information across to the user if the field is blank instead of a "0". It also gave us some practice when implementing our database in checking data to see if it is null. We also changed the Foreign Key for team_id in the same Drivers table to be able to be set to null as well. When a team is deleted from the Teams table, instead of deleting the record in the Drivers table, it will instead set the Teams_team_id field to null. This makes it so that a driver is not lost just because a team has been deleted.
- On Steps 3 and 4 we received feedback that while our website was clear and easy to follow, it might be nice to differentiate it by adding some CSS. We decided to go in and add some design elements such as a Favicion, and images, while also tweaking the pages a little to make them nicer to look at. While the looks of the website aren't the focus of this project, we wanted to make sure that things looked polished while staying clean and consistent across pages.

Project Outline

Group 11 consists of team members Jason Gottlieb and Matt French. Our project is called Formula 1 Season Database, and we have been motivated to create a database for all the seasons of Formula 1 (also known as F1). F1 is growing in popularity, and they want to keep track of all the previous, current, and future seasons in their sport. In the sport of F1, there are seasons that start in March and end around December. In each season there are around 22 Grand Prix (with that number slightly increasing in the future) with 10 teams each with 1 principle and 2 drivers per team.

Database Outline

F1_Seasons

Records the details of the racing season

- season_id
    - int, auto_increment, unique, not NULL, PK
- year
    - int, not NULL
- num_races
    - int, not Null
- Relationship: 1:M between Seasons and Grand Prix

Grand_Prix

Records the details of each Grand Prix in a season

- race_id
    - int, auto_increment, unique, not NULL, PK
- track_location
    - varchar, not NULL
- distance_per_lap
    - int, not NULL, (km)
- num_laps
    - int, not NULL
- has_sprint
    - tinyint, not NULL Default 0
- Relationship: 1:M between Grand Prix and Seasons, M:M between Grand Prix and Teams

Teams

Records the details of each team in a season

- team_id
    - int, auto_increment, unique, PK
- team_country
    - varchar, not NUll
- car_model
    - varchar, not NULL
- Relationship, 1:M between Teams and Drivers, 1:1 between Principals and Teams, M:M between Grand Prix and Teams

Principals

Records the details of each Team Principal in a Season

- principal_id
    - int, unique, not NULL, PK
- Teams_
- team_id
    - int, auto_increment, unique, not NULL, FK from Teams
- principal_name
    - Varchar, not NULL
- Relationship: 1:1 between Principals and Teams

Drivers

Records the details of each Driver in a Season

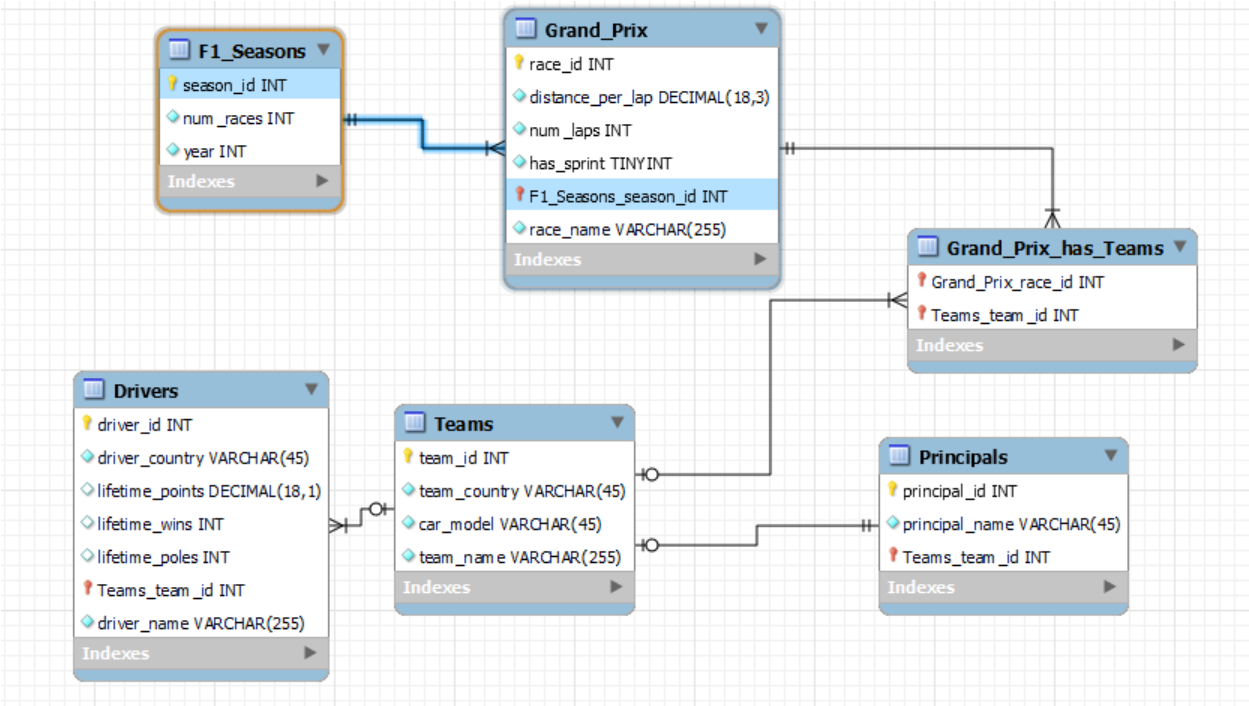
- driver_id
    - int, auto_increment, unique, not NULL, PK
- Teams_team_id
    - int, auto_increment, unique, FK from Teams
- driver_country
    - varchar, not NULL
- liftime_points
    - int, not NULL
- liftime_wins
    - int, not NULL
- lifetime_poles
    - int, not NULL
- Relationship: M:1 between Teams and Drivers

Grand_Prix_has_Teams

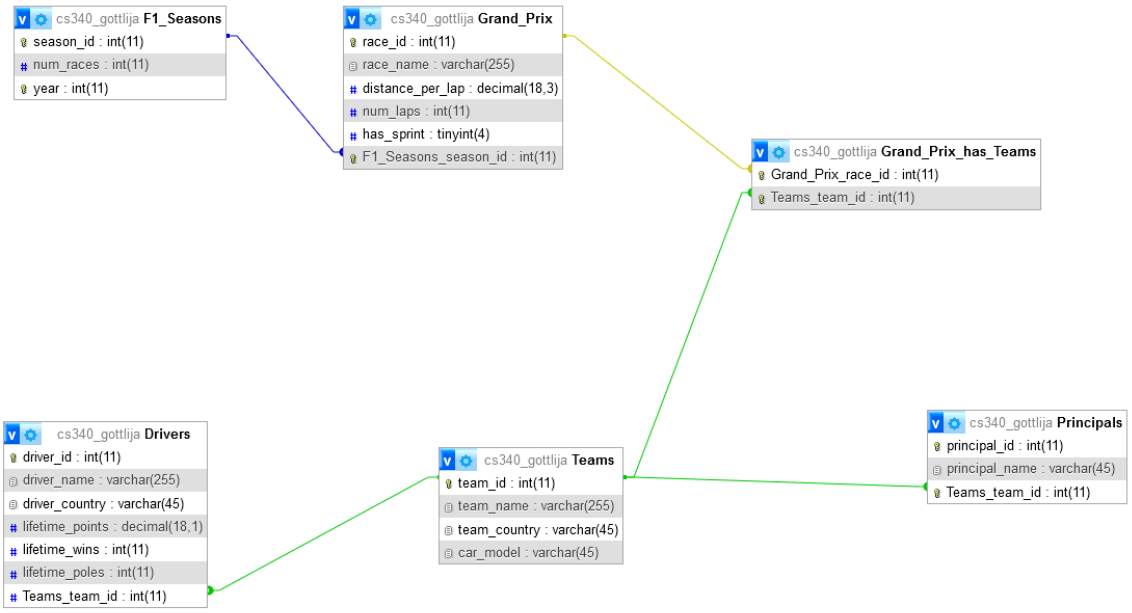
Intersection table between Grand Prix and Teams

- Grand Prix_race_id
    - INT, NOT NULL, FK from Grand Prix
- Teams_team_id
    - INT, FK from Teams

ERD Diagram



Schema Diagram



Sample Data

F1_Seasons

3NF

season_id	num_races	year
1	21	2019
2	17	2020
3	22	2021
4	22	2022
5	22	2023

We were not able to come up with any anomalies in the F1 seasons. Num_races is a static, set number that is decided before the season starts. It is extremely rare for this number to change throughout the season. The only times this has occurred was in 2020 due to the Covid-19 pandemic and in 2023, again due to Covid-19.

Grand_Prix

3NF

race_id	race_name	distance_per_lap	num_laps	has_sprint	F1 Seasons_season_id
1	Bahrain Grand Prix	5.142	57	0	4
2	Saudi Arabian Grand Prix	6.174	50	0	4
3	Australian Grand Prix	5.278	58	0	4
4	Bahrain Grand Prix	5.412	57	0	5
5	Azerbaijan Grand Prix	6.003	51	1	5

We have identified that we need to change the attribute type of distance_per_lap to a decimal and to add a race_name attribute to this table.

Teams

3NF

team_id	team_name	team_country	car_model
1	Oracle Red Bull Racing	Austria	RB19
2	Mercedes-AMG Petronas F1 Team	Germany	W14
3	Scuderia Ferrari	Italy	SF-23
4	Williams Racing	United Kingdom	FW45
5	BWT Alpine F1 Team	France	A523

We need to add a team_name attribute

Grand_Prix_has_Teams

3NF

Grand Prix_race_id	Teams_team_id
1	1
1	2
1	3
2	1
2	2

Drivers

3NF

driver_ID	driver_name	driver_country	lifetime_points	lifetime_wins	linetime_poles	Teams_team_id
1	Max Verstappen	Netherlands	2266.5	43	27	1
2	Lewis Hamilton	United Kingdom	4526.5	103	103	2
3	Charles Leclerc	Monaco	940	5	19	3
4	Esteban Ocon	France	395	1	0	5
5	Alex Albon	Thailand	212	0	0	4

We need to add a driver name attribute and change lifetime_points to decimal value

Principals

3NF

principal_id	principal_name	Teams_team_id
1	Christian Horner	1
2	Toto Wolff	2
3	Frederic Vasseur	3
4	Otmar Szafnauer	4
5	James Vowels	5

Functionality

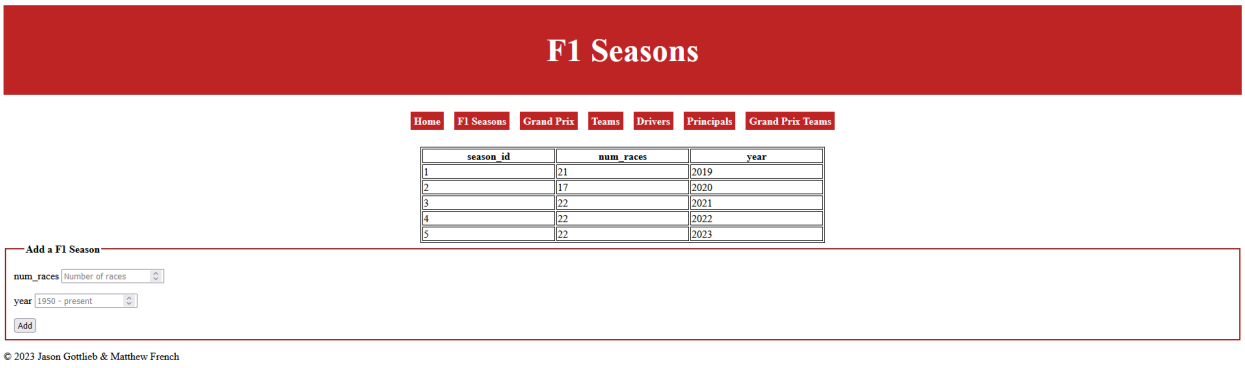
Screen Captures

Home Page

F1 Seasons

CREATE, READ

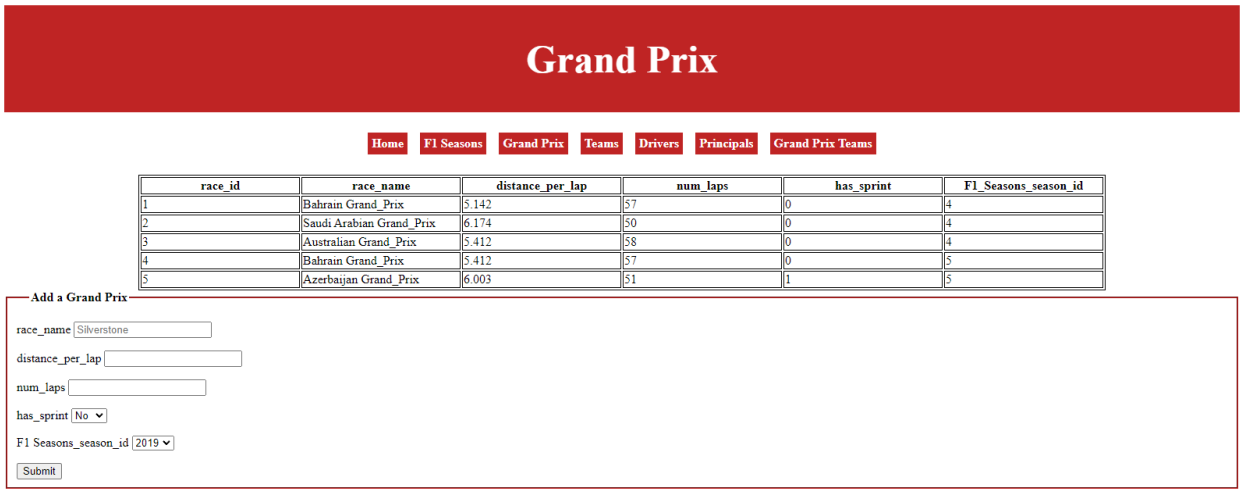
Users can view the table at the top of the screen and add records by inputting the number of races in a season and the year



Grand Prix

CREATE, READ

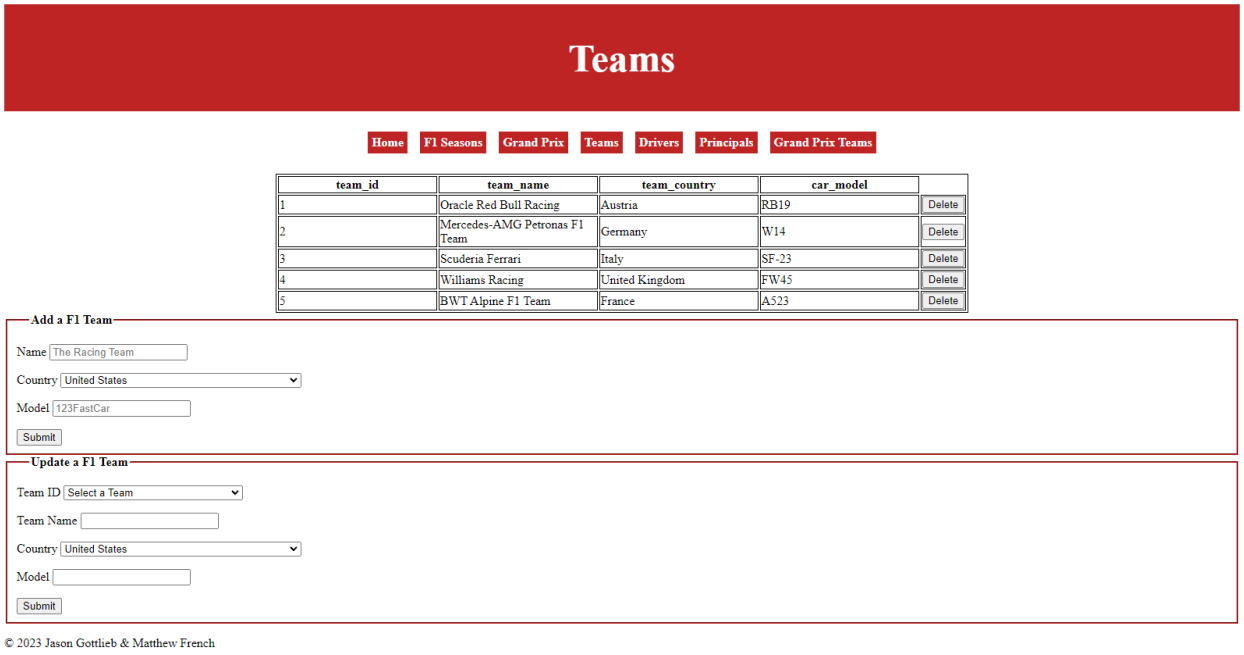
Users can view the table at the top of the screen and add records by inputting the race name, distance per lap, number of laps, whether or not the race has a sprint race, and the F1 season it is attached to. The drop down is dynamic and shows all records in the F1 Seasons table. The drop down displays the Seasons by their year



Teams

CREATE, READ, UPDATE, DELETE

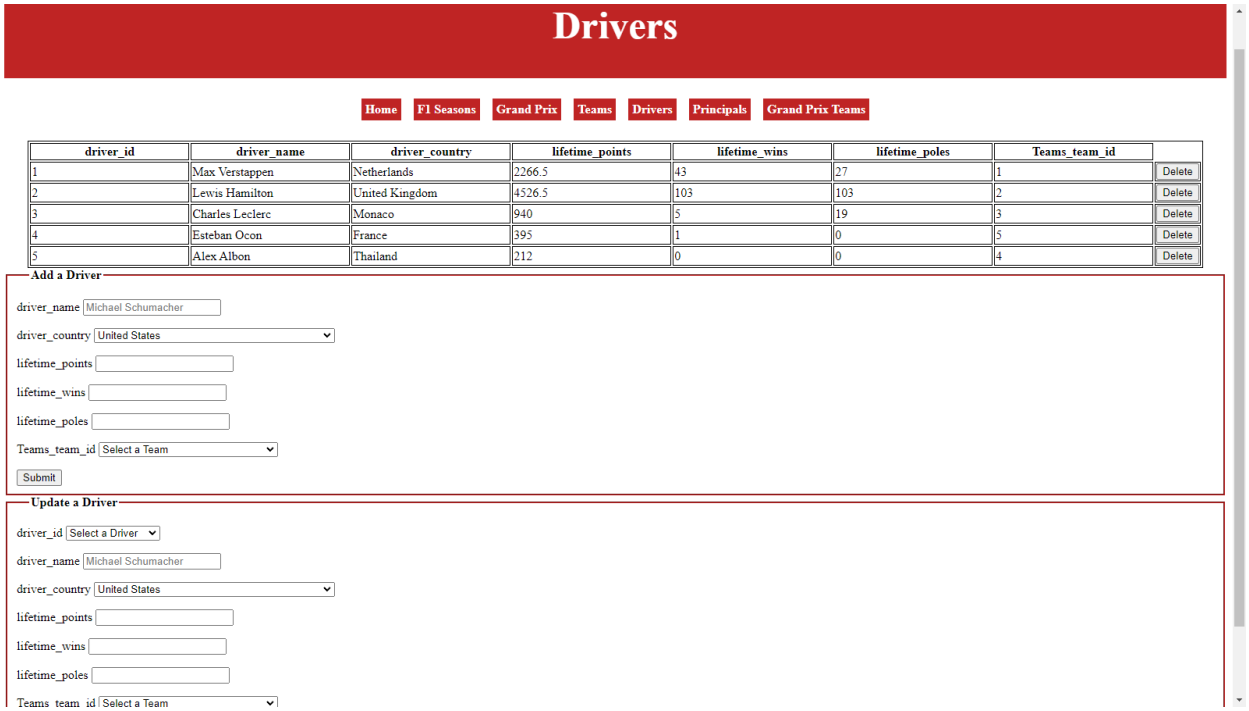
Users can view the table and can add F1 Teams to the database by creating a Team with the following attributes: name, country, and model. Users can also update a Team's name, country, and model by selecting a team from the drop down. A team can be deleted from the database by clicking the 'delete' button on the far right in each row. Deleting a team sets the Teams_team_id in Drivers Null. It also deletes any rows with that team in Grand Prix Teams and Principals.



Drivers

CREATE, READ, UPDATE, DELETE

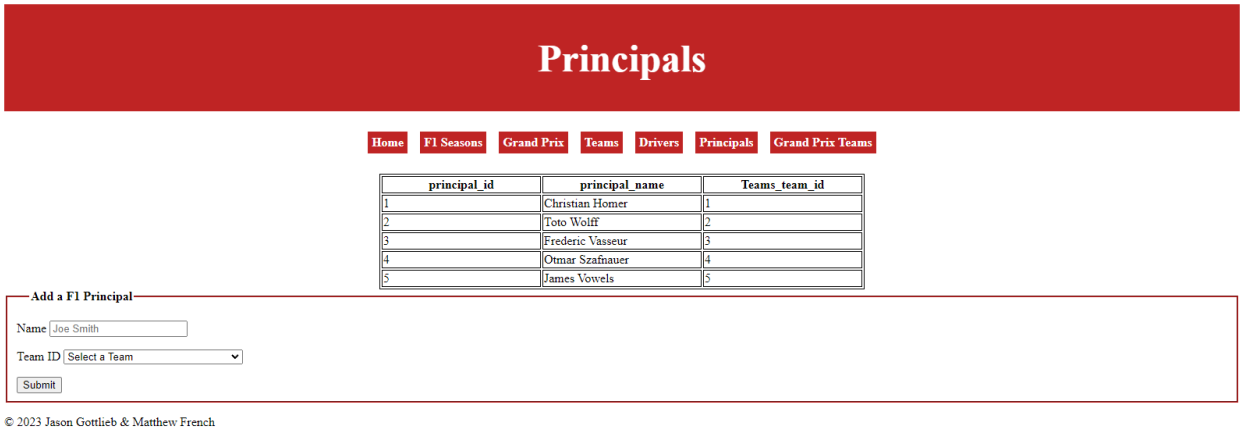
Users can view the table at the top of the screen and add a new Driver by inputting the driver's name, country, lifetime points, lifetime wins, lifetime poles, and the Team that the driver belongs to. The drop down is dynamic and shows all records in the Teams table. The drop down displays the Teams by their name. Users can update a driver by first selecting the driver they wish to update in a dynamic dropdown where driver's names are displayed. They can then enter the appropriate information and the table will be dynamically updated when they hit submit. If a user deletes a Team from the Teams table, the team_id of the driver will be updated to NULL. The record for the driver will still exist, that field will just be left blank.



Principals

CREATE, READ

Users can view the table at the top of the screen and add records by inputting the principal name and the Team it is attached to. The drop down is dynamic and shows all records in the Teams table. The drop down displays the Teams by their name. If a Team is deleted from the Teams table, the Principal will also be deleted.



Grand Prix Teams

CREATE, READ

Users can view the team, race, and year the race occurred and add a team to a race by using the drop down to select a team and race. The drop down is dynamic and shows all the races and teams in the database. If a user deletes a team from the team page, the rows with that team will be deleted.

Citations:

- Data Definition Query File Generated by MySQL Workbench CE
- Many Sections copied and adapted from:
    - OSU nodejs-starter-app Github. Modified to run with our database
    - Source URL: https://github.com/osu-cs340-ecampus/nodejs-starter-app/tree/main --}}
- All CSS templates were found here:
    - https://www.w3schools.com/css/default.asp
- Favicon image found here:
    - https://1000logos.net/allpng/
- F1 cars homepage image found here:
    - https://www.autosport.com/f1/news/how-fast-is-an-f1-car-top-speeds-of-f1-indycar-motogp-and-more-4980734/4980734/