CPSC 304 Project Cover Page

Milestone #: 2
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Group Number: 11

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia.

2. Changes to ERD Diagram

- Removed "IsActive" on the "On" relation (Can be determined by looking to "ToDate" "FromDate")
- Removed "IsCurrentlyDriving" on the 'Drives' relation (Can be determined by looking at "ToDate" and "FromDate")

3. The schema derived from the ERD

Notes before grading:
- To make grading easier, tables are specified in order left to right, top to bottom, if looking at ERD
- List of Candidate Keys under each table does not include the Primary Key, as the Primary Key is implied to also be a Candidate key (ie. imagine the primary key is listed underneath candidate
- List of Constraints under each table does not include the Primary Key being UNIQUE and NOT NULL, as the Primary Key is implied to be UNIQUE and NOT NULL
- <u>This is a Primary Key</u>
- **This is a Foreign Key**
- **<u>This is a Foreign Key that is also a Primary Key</u>**

Cars:
Table:
Cars(powerUnit: string, chassisModel: string, <u>carNumber: int</u>, **teamName: string**, toDate: Date, fromDate: Date, **driverID: int**)

Candidate Keys:
- N/A

Constraints:
- driverID NOT NULL
- fromDate NOT NULL

WorksOn
Table:
WorksOn(**<u>carNumber: int</u>**, **<u>teamName: string</u>**, **<u>engineerID: int</u>**)

Candidate Keys:

- N/A

Constraints:
- Need assertions to maintain the many-to-many participation constraint

Maintains
Table:
Maintains(**carNumber: int**, **teamName: string**, **pitCrewID: int**)

Candidate Keys:
- N/A

Constraints:
- Need assertions to maintain the many-to-many participation constraint

PitCrew
Table:
PitCrew(<u>pitCrewID: int</u>, Name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, position: string, bestTime: Time)

Candidate Keys:
- N/A

Constraints:
- N/A

Engineers
Table:
Engineers(<u>engineerID: int</u>, name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, educationLevel: string)

Candidate Keys:
- N/A

Constraints:
- N/A

Investors
Table:
Investors(<u>name: string</u>)

Candidate Keys:
- N/A

Constraints:
- N/A

InvestsIn

Table:
InvestsIn(**investorName: string**, **teamName: string**, startDate: Date, endDate: Date, amount: int, level: string)

Candidate Keys:
- N/A

Constraints:
- N/A

Teams

Table:
Teams(teamName: string, baseLocation: string, owner: string, firstTeamEntry: Date, fastestLaps: int, worldChampionships: int)

Candidate Keys:
- N/A

Constraints:
- N/A

MaintainsCarsFor (Previously "On")

Table:
MaintainsCarsFor(**teamName: string**, **pitCrewID: int**, fromDate: Date, toDate: Date)

Candidate Keys:
- N/A

Constraints:
- Need assertions to maintain the many-to-many participation constraint

DrivesOn (Previously "On")

Table:

DrivesOn(**teamName: string**, **driverID: int**, fromDate: Date, toDate: Date)

Candidate Keys:
- N/A

Constraints:
- Need assertions to maintain the many-to-many participation constraint

Manages (Previously "On")

Table:

Manages(**teamName: string**, **managerID: int**, fromDate: Date, toDate: Date)

Candidate Keys:
- N/A

Constraints:
- Need assertions to maintain the many-to-many participation constraint

EngineersFor (Previously "On")

Table:

EngineersFor(**teamName: string**, **engineerID: int**, fromDate: Date, toDate: Date)

Candidate Keys:
- N/A

Constraints:
- Need assertions to maintain the many-to-many participation constraint

Managers

Table:

Managers(managerID: int, name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, role: string)

Candidate Keys:
- N/A

Constraints:
- N/A

ParticipatedIn

Table:

ParticipatedIn(**<u>teamName: string</u>**, **<u>seasonYear: int</u>**, constructorRank: int)

Candidate Keys:
- (seasonYear, constructorRank)

Constraints:
- constructorRank NOT NULL
- UNIQUE (teamName, seasonYear)
    - A team can only have one entry per year
    - Covered by primary key
- UNIQUE (seasonYear, constructorRank)
    - Each year, each rank can only occur once

DroveDuring

Table:

DroveDuring(**<u>driverID: int</u>**, **<u>seasonYear: int</u>**, driverRank: int)

Candidate Keys:
- (seasonYear, driverRank)

Constraints:
- driverRank NOT NULL
- UNIQUE (driverId, seasonYear)
    - A driver can only have one entry per year
    - Covered by primary key
- UNIQUE (seasonYear, driverRank)
    - Each year, each rank can only occur once

Drivers

Table:

Drivers(<u>driverID: int</u>, name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, worldChampionships: int, podiums: int, fastestLaps: int, racesWon: int)

Candidate Keys:
- N/A

Constraints:
- N/A

Raced

Table:

Raced(**raceID: int**, **driverID: int,** placement: int)

Candidate Keys:
- (raceID, placement)

Constraints:
- placement NOT NULL
- UNIQUE (raceID, placement)
    - Each race must have unique placements (ie two different people cant place first)
- Need assertions to maintain the many-to-many participation constraint

Races

Table:

Races(raceID: int, raceDate: Date, temperature: int, fastestLapTime: Time, redFlagCount: int, safetyCarModel: string, DNFCount: int, **poleSitterDriverID: int**, **seasonYear: int**, **circuitName: string**)

Candidate Keys:
- raceDate

Constraints:
- seasonYear NOT NULL
- circuitName NOT NULL
- poleSitterDriverID NOT NULL

Circuits

Table:

Circuits(circuitName: string, mapURL: string, lastLengthIUsed: int, direction: string, type: string, changeInElevation: int, **grandPrixTitle: string**)

Candidate Keys:
- mapURL

Constraints:
- grandPrixTitle NOT NULL

GrandPrix
Table:
GrandPrix(<u>title: string</u>, country: string)

Candidate Keys:
- N/A

Constraints:
- N/A

Season
Tables:
Season(<u>year: int</u>, races: int)

Candidate Keys:
- N/A

Constraints:
- races NOT NULL

4. Functional Dependencies

InvestsIn
amount → level

Races
Added attribute "safetyCarTopSpeed" to Races to create another FD for grading

safetyCarModel → safetyCarTopSpeed

5. Normalization / BCNF's

—Changed Tables—
InvestsIn
FD's (non-trivial):
amount → level

investorName, teamName → startDate
investorName, teamName → endDate
investorName, teamName → amount
investorName, teamName → level

Normalization (BCNF):
1. Do any of the FD's violate BCNF? Yes. Amount is not a superkey.
2. Decompose InvestsIn into two relations, according to the violated amount →
   level FD:
   a. InvestIn(investorName, teamName, startDate, endDate, amount)
   b. InvestInAmounts(amount, level)
3. Is the decomposed relation in BCNF? Yes. All FD's are super keys.
4. Final Answer:
   a. InvestIn(**investorName**, **teamName**, startDate, endDate, **amount**)
   b. InvestInAmounts(amount, level)

Races
Red = added attribute
Races(raceID: int, raceDate: Date, temperature: int, fastestLapTime: Time,
redFlagCount: int, safetyCarModel: string, safetyCarTopSpeed: int, DNFCount: int,
poleSitterDriverID: int, **seasonYear: int**, **circuitName: string**)

FD's (non-trivial):
safetyCarModel → safetyCarTopSpeed
raceID → raceDate
raceID → temperate
raceID → fastestLapTime
raceID → redFlagCount
raceID → DNFCount
raceID → poleSitterDriverID
raceID → seasonYear
raceID → circuitName

Normalization (BCNF):
1. Do any of the FD's violate BCNF? Yes. safetyCarModel is not a superkey.
2. Decompose InvestsIn into two relations, according to the violated
   safetyCarModel → safetyCarTopSpeed FD:
   a. Races(raceID: int, raceDate: Date, temperature: int, fastestLapTime: Time,
      redFlagCount: int, safetyCarModel: string, DNFCount: int,
      poleSitterDriverID: int, seasonYear: int, circuitName: string)

      b.   SafetyCars(safetyCarModel: string, safetyCarTopSpeed: int)
3. Is the decomposed relation in BCNF? Yes. All FD's are super keys.
4. Final Answer:
      a.   Races(<u>raceID: int</u>, raceDate: Date, temperature: int, fastestLapTime: Time, redFlagCount: int, **safetyCarModel: string**, DNFCount: int, poleSitterDriverID: int, seasonYear: int, circuitName: string)
      b.   SafetyCars(<u>safetyCarModel: string</u>, safetyCarTopSpeed: int)

—Unchanged Tables—

*Cars(powerUnit: string, chassisModel: string, <u>carNumber: int</u>, **<u>teamName: string</u>**, toDate: Date, fromDate: Date, **driverID: int**)*

*WorksOn(**<u>carNumber: int</u>**, **<u>teamName: string</u>**, **<u>engineerID: int</u>**)*

*Maintains(**<u>carNumber: int</u>**, **<u>teamName: string</u>**, **<u>pitCrewID: int</u>**)*

PitCrew(<u>pitCrewID: int</u>, Name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, position: string, bestTime: Time)

Engineers(<u>engineerID: int</u>, name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, educationLevel: string)

Investors(<u>name: string</u>)

Teams(<u>teamName: string</u>, baseLocation: string, owner: string, firstTeamEntry: Date, fastestLaps: int, worldChampionships: int)

*MaintainsCarsFor(**<u>teamName: string</u>**, **<u>pitCrewID: int</u>**, fromDate: Date, toDate: Date)*

*DrivesOn(**<u>teamName: string</u>**, **<u>driverID: int</u>**, fromDate: Date, toDate: Date)*

Manages(**<u>teamName: string</u>**, **<u>managerID: int</u>**, fromDate: Date, toDate: Date)

*EngineersFor(**<u>teamName: string</u>**, **<u>engineerID: int</u>**, fromDate: Date, toDate: Date)*

Managers(<u>managerID: int</u>, name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, role: string)

*ParticipatedIn(**teamName: string**, **seasonYear: int**, constructorRank: int)*

*DroveDuring(**driverID: int**, **seasonYear: int**, driverRank: int)*

Drivers(driverID: int, name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, worldChampionships: int, podiums: int, fastestLaps: int, racesWon: int)

*Raced(**raceID: int**, **driverID: int**, placement: int)*

*Circuits(circuitName: string, mapURL: string, lastLengthIUsed: int, direction: string, type: string, changeInElevation: int, **grandPrixTitle: string**)*

GrandPrix(title: string, country: string)

Seasons(year: int, races: int)

6. SQL DDL CREATE

Notes before grading:
- Tables are specified in the same order as #3. New tables that came from #5 are listed at the bottom.

Cars: Cars(powerUnit: string, chassisModel: string, carNumber: int, **teamName: string**, toDate: Date, fromDate: Date, **driverID: int**)

```
CREATE TABLE car
  (
    number        INT,
    team_name     CHAR(255),
    power_unit    CHAR(255),
    chassis_model CHAR(255),
    driver_id     INT NOT NULL,
    to_date       DATE,
    from_date     DATE NOT NULL,
    PRIMARY KEY (number, team_name),
    FOREIGN KEY (team_name) REFERENCES team(name) ON DELETE CASCADE
ON UPDATE CASCADE
```

```
        FOREIGN KEY (driver_id) REFERENCES driver ON DELETE SET NULL ON
UPDATE CASCADE
    )
```

WorksOn: WorksOn(**carNumber: int**, **teamName: string**, **engineerID: int**)

```
CREATE TABLE works_on
    (
    team_name    CHAR(255),
    engineer_id INT,
    car_number   INT,
    PRIMARY KEY (team_name, engineer_id, car_number),
    FOREIGN KEY (team_name) REFERENCES team (NAME) ON DELETE SET NULL
                                         ON UPDATE CASCADE,
    FOREIGN KEY (engineer_id) REFERENCES engineer(id) ON DELETE SET
NULL ON UPDATE CASCADE,
    FOREIGN KEY (car_number) REFERENCES car(number) ON DELETE SET
NULL ON UPDATE CASCADE,
    )
```

Maintains: Maintains(**carNumber: int**, **teamName: string**, **pitCrewID: int**)

```
CREATE TABLE maintains
    (
    team_name    CHAR(255),
    pit_crew_id INT,
    car_number   INT,
    PRIMARY KEY (team_name, pit_crew_id, car_number),
    FOREIGN KEY (team_name) REFERENCES team (team_name) ON DELETE SET
NULL ON UPDATE CASCADE,
    FOREIGN KEY (pit_crew_id) REFERENCES pit_crew(id) ON DELETE SET
NULL ON UPDATE CASCADE,
    FOREIGN KEY (car_number) REFERENCES car(number) ON DELETE SET
NULL ON UPDATE CASCADE,
    )
```

PitCrew: PitCrew(pitCrewID: int, Name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, position: string, bestTime: Time)

```
CREATE TABLE pit_crew
    (
    id              INT,
    name            CHAR(255),
    nationality     CHAR(255),
```

```
        dob              DATE,
        place_of_birth CHAR(255),
        position         CHAR(255),
        best_time        TIME,
        PRIMARY KEY (id)
    )
```

Engineers: Engineers(engineerID: int, name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, educationLevel: string)

```
CREATE TABLE engineer
    (
        id                INT,
        name              CHAR(255),
        nationality       CHAR(255),
        dob               DATE,
        place_of_birth    CHAR(255),
        education_level   CHAR(255),
        PRIMARY KEY (id)
    )
```

Investors: Investors(name: string)

```
CREATE TABLE investor
    (
        name CHAR(255),
        PRIMARY KEY (name)
    )
```

Teams: Teams(teamName: string, baseLocation: string, owner: string, firstTeamEntry: Date, fastestLaps: int, worldChampionships: int)

```
CREATE TABLE team
    (
        name                 CHAR(255),
        base_location        CHAR(255),
        owner                CHAR(255),
        first_team_entry     DATE,
        fastest_laps         INT,
        world_championships  INT,
        PRIMARY KEY (name)
    )
```

MaintainsCarsFor (Previously "On"): MaintainsCarsFor(<u>**teamName: string**</u>, <u>**pitCrewID: int**</u>, fromDate: Date, toDate: Date)

```sql
CREATE TABLE maintains_cars_for
    (
        team_name    CHAR(255),
        pit_crew_id  INT,
        from_date    DATE,
        to_date      DATE,
        PRIMARY KEY (team_name, pit_crew_id),
        FOREIGN KEY (team_name) REFERENCES team(name) ON DELETE SET NULL
ON UPDATE CASCADE,
        FOREIGN KEY (pit_crew_id) REFERENCES pit_crew(id) ON DELETE SET
NULL ON UPDATE CASCADE
    )
```

DrivesOn (Previously "On"): DrivesOn(<u>**teamName: string**</u>, <u>**driverID: int**</u>, fromDate: Date, toDate: Date)

```sql
CREATE TABLE drives_on
    (
        team_name CHAR(255),
        driver_id INT,
        from_date DATE,
        to_date   DATE,
        PRIMARY KEY (team_name, driver_id),
        FOREIGN KEY (team_name) REFERENCES team(name) ON DELETE SET NULL
ON UPDATE CASCADE,
        FOREIGN KEY (driver_id) REFERENCES driver(id) ON DELETE SET NULL
ON UPDATE CASCADE
    )
```

Manages (Previously "On"): Manages(<u>**teamName: string**</u>, <u>**managerID: int**</u>, fromDate: Date, toDate: Date)

```sql
CREATE TABLE manages
    (
        team_name    CHAR(255),
        manager_id   INT,
        from_date    DATE,
        to_date      DATE,
        PRIMARY KEY (team_name, manager_id),
        FOREIGN KEY (team_name) REFERENCES team(name) ON DELETE SET NULL
ON UPDATE CASCADE,
```

```
        FOREIGN KEY (manager_id) REFERENCES manager(id) ON DELETE SET
NULL ON UPDATE CASCADE
    )
```

EngineersFor (Previously "On"): EngineersFor(<u>**teamName: string**</u>, <u>**engineerID: int**</u>, fromDate: Date, toDate: Date)

```
CREATE TABLE engineers_for
    (
        team_name    CHAR(255),
        engineer_id INT,
        from_date    DATE,
        to_date      DATE,
        PRIMARY KEY (team_name, engineer_id),
        FOREIGN KEY (team_name) REFERENCES team(name) ON DELETE SET NULL
ON UPDATE CASCADE,
        FOREIGN KEY (engineer_id) REFERENCES engineer(id) ON DELETE SET
NULL ON UPDATE CASCADE
    )
```

Managers : Managers(<u>managerID: int</u>, name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, role: string)

```
CREATE TABLE manager
    (
        name             CHAR(255),
        nationality      CHAR(255),
        dob              DATE,
        place_of_birth CHAR(255),
        position         CHAR(255),
        id       INT,
        role             CHAR(255),
        PRIMARY KEY (id)
    )
```

ParticipatedIn: ParticipatedIn(<u>**teamName: string**</u>, <u>**seasonYear: int**</u>, constructorRank: int)

```
CREATE TABLE participated_in
    (
        season_year        INT,
        team_name          CHAR(255),
```

```sql
    constructor_rank INT NOT NULL,
    PRIMARY KEY (season_year, team_name),
    FOREIGN KEY (season_year) REFERENCES season(year) ON DELETE
CASCADE ON UPDATE CASCADE,
    FOREIGN KEY (team_name) REFERENCES team(name) ON DELETE SET NULL
ON UPDATE CASCADE,
    UNIQUE(season_year, constructor_rank)
  )
```

DroveDuring: DroveDuring(**driverID: int**, **seasonYear: int**, driverRank: int)

```sql
CREATE TABLE drove_during
  (
    season_year INT,
    driver_id   INT,
    driver_rank INT NOT NULL,
    PRIMARY KEY (season_year, driver_id),
    FOREIGN KEY (season_year) REFERENCES season(year) ON DELETE
CASCADE ON UPDATE CASCADE,
    FOREIGN KEY (driver_id) REFERENCES driver(id) ON DELETE CASCADE
ON UPDATE CASCADE,
    UNIQUE(season_year, driver_rank)
  )
```

Drivers: Drivers(driverID: int, name: string, nationality: string, dateOfBirth: Date, placeOfBirth: string, worldChampionships: int, podiums: int, fastestLaps: int, racesWon: int)

```sql
CREATE TABLE driver
  (
    id                   INT,
    name                 CHAR(255),
    nationality          CHAR(255),
    dob                  DATE,
    place_of_birth       CHAR(255),
    world_championships  INT,
    fastest_laps         INT,
    races_won            INT,
    podiums              INT,
    PRIMARY KEY (id)
  )
```

Raced: Raced(**raceID: int**, **driverID: int,** placement: int)

```
CREATE TABLE raced
   (
      driver_id INT,
      race_id   INT,
      placement INT NOT NULL,
      PRIMARY KEY (driver_id, race_id),
      FOREIGN KEY (race_id) REFERENCES race(id) ON DELETE CASCADE ON
UPDATE CASCADE,
      FOREIGN KEY (driver_id) REFERENCES driver(id) ON DELETE CASCADE
ON UPDATE CASCADE,
      UNIQUE(placement, race_id)
   )
```

Circuits: Circuits(circuitName: string, mapURL: string, lastLengthIUsed: int, direction: string, type: string, changeInElevation: int, **grandPrixTitle: string**)

```
CREATE TABLE circuit
   (
      name                CHAR(255),
      map_url             CHAR(255),
      last_length_used    INT,
      direction           CHAR(255),
      type                CHAR(255),
      change_in_elevation INT,
      grand_prix_title    CHAR(255),
      PRIMARY KEY (name),
      FOREIGN KEY (grand_prix_title) REFERENCES grand_prix(title) ON
DELETE SET NULL ON UPDATE CASCADE,
      UNIQUE(map_url)
   )
```

GrandPrix: GrandPrix(title: string, country: string)

```
CREATE TABLE grand_prix
   (
      title   CHAR(255),
      country CHAR(255)
      PRIMARY KEY (title)
   )
```

InvestsIn: InvestIn(**investorName**, **teamName**, startDate, endDate, **amount**)

```
CREATE TABLE invests_in
```

```
    (
        investor_name CHAR(255),
        team_name      CHAR(255),
        start_date     DATE,
        end_date       DATE,
        amount         INT,
        PRIMARY KEY (investor_name, team_name),
        FOREIGN KEY (investor_name) REFERENCES investor(NAME) ON DELETE
CASCADE ON UPDATE CASCADE,
        FOREIGN KEY (team_name) REFERENCES team(NAME) ON DELETE CASCADE
ON UPDATE CASCADE,
        FOREIGN KEY (amount) REFERENCES invests_in_amounts(amount) ON
DELETE CASCADE ON UPDATE CASCADE,
    )
```

InvestsInAmounts: InvestInAmounts(<u>amount</u>, level)

```
CREATE TABLE invests_in_amounts
    (
        amount INT,
        level  CHAR(255),
        PRIMARY KEY (amount)
    )
```

Races: Races(<u>raceID: int</u>, raceDate: Date, temperature: int, fastestLapTime: Time, redFlagCount: int, **safetyCarModel: string**, DNFCount: int, **poleSitterDriverID: int**, **seasonYear: int**, **circuitName: string**)

```
CREATE TABLE race
    (
        id              INT,
        date            DATE,
        temperature     INT,
        fastest_lap     TIME,
        red_flag_count  INT,
        safety_car_model CHAR(255),
        dnf_count       INT,
        circuit_name    CHAR(255) NOT NULL,
        season_year     INT NOT NULL,
        pole_sitter_id  INT NOT NULL,
        PRIMARY KEY (id),
        FOREIGN KEY (circuit_name) REFERENCES circuit(name) ON DELETE SET
NULL ON UPDATE CASCADE,
```

```
      FOREIGN KEY (season_year) REFERENCES season(year) ON DELETE SET
NULL ON UPDATE CASCADE,
      FOREIGN KEY (pole_sitter_id) REFERENCES driver(id) ON DELETE SET
NULL ON UPDATE CASCADE,
      FOREIGN KEY (safety_car_model) REFERENCES safety_car(model) ON
DELETE CASCADE ON UPDATE CASCADE,
  )
```

SafetyCar: SafetyCar(<u>model: string</u>, topSpeed: int)

```
CREATE TABLE safety_car
  (
    model  CHAR(255),
    top_speed   INT,
    PRIMARY KEY (model)
  )
```

Season: Season(<u>year: int</u>, races: int)

```
CREATE TABLE season
  (
    year  INT,
    races    INT,
    PRIMARY KEY (year)
  )
```

7. INSERT Statements

** **Please see tables attached at the end of document**

Cars

```
Insert INTO Cars (1,"Mercedes-AMG Petronas Formula 1 Team", "Renault",
MD34s, 04-10-19, 10-14-22, 149)

Insert INTO Cars (2, "Red Bull Racing","Honda", RB2d7, 12-11-18
10-15-22, 240)
```

Insert INTO Cars (1,"Mercedes-AMG Petronas Formula 1 Team", "Renault", MD34s, 04-10-19, 10-14-22, 149)

Insert INTO Cars (3, "Scuderia Ferrari Ferrari", Frh9d, 05-12-13, 10-16-22, 241)

Insert INTO Cars (4, "McLaren F1 Team", "Mercedes", MLnw0, 04-13-20, 10-17-22, 132)

Insert INTO Cars (5, "Alpine F1 Team", "Renault", APjf8, 04-14-21 10-18-22, 164)

WorksOn

Insert INTO WorksOn (1, "Mercedes-AMG Petronas Formula 1 Team", 1)

Insert INTO WorksOn (2, "Red Bull Racing", 14)

Insert INTO WorksOn (3, "Scuderia Ferrari", 11)

Insert INTO WorksOn (4, "McLaren F1 Team", 16)

Insert INTO WorksOn (5, "Alpine F1 Team", 7)

Maintains

Insert INTO Maintains (1, "Mercedes-AMG Petronas Formula 1 Team", 22)

Insert INTO Maintains (2, "Red Bull Racing", 22)

Insert INTO Maintains (3, "Scuderia Ferrari", 27)

Insert INTO Maintains (4, "McLaren F1 Team", 21)

Insert INTO Maintains (5, "Alpine F1 Team", 35)

PitCrew

Insert INTO pitCrew (22, "Samantha", German, 12/1/1989, Germany, "BR" 2.36)

Insert INTO pitCrew (21, "Sam", Iranian, 4/19/1993, "Iran", BR, 1.82)

Insert INTO pitCrew (27,"Lilly", "Bulgarian",3/10/1990, "United States of America", "FL",2.2)

Insert INTO pitCrew (21, "Alex", "Spanish", 1/1/1986, "Spain", "FR",1.97)

Insert INTO pitCrew (35, "Heikki", "Swedish", 3/22/1984, "Sweden" , "BL", 1.88)

Engineers

Insert INTO Engineers (1, "David", "Honduran", 5/22/1995, "Honduras", "Bachelor's or equivalent level")

Insert INTO Engineers (14, "Jarno","Thai", 4/13/1983, "Canada", "Post-secondary non-tertiary education")

Insert INTO Engineers (11, "Mellisa", "Haitian", 10/5/1993, "United States of America", "Master's or equivalent level")

Insert INTO Engineers (16, "Mark","Mongolian", 8/10/1987, "Philippines", "Bachelor's or equivalent level")
Insert INTO Engineers (7, "Jenson", "Cuban", 11/16/1994, "Canada", "Bachelor's or equivalent level")

Investors

Insert INTO Investors ("AMD")

Insert INTO Investors ("Hewlett Packard Enterprise")

Insert INTO Investors ("Chrome")

Insert INTO Investors ("Dell")

Insert INTO Investors ("Goldman Sachs")

Teams

Insert INTO Teams ("Mercedes-AMG Petronas Formula 1 Team", "British", "Johnson", 6/19/1991, 7, 7)

Insert INTO Teams ("Red Bull Racing", "German", "Williams", 6/5/1997, 9, 11)

Insert INTO Teams ("Scuderia Ferrari","British", "Brown" , 8/11/1982, 12, 2)

Insert INTO Teams ("McLaren F1 Team", "French", "Jones" , 2/17/1994, 7, 5)

Insert INTO Teams ("Alpine F1 Team", "Italian", "Miller", 11/27/1988 4, 12)

MaintainsCarsFor (Previously "On")

Insert INTO MaintainsCarsFor ("Mercedes-AMG Petronas Formula 1 Team", 22, 11/23/2016, null)

Insert INTO MaintainsCarsFor ("Red Bull Racing", 21, 3/25/2021, null

Insert INTO MaintainsCarsFor ("Scuderia Ferrari",27, 1/10/2019, null)

Insert INTO MaintainsCarsFor ("McLaren F1 Team", 21, 12/17/2016, null)

Insert INTO MaintainsCarsFor ("Alpine F1 Team", 35, 6/26/2019, null)

DrivesOn (Previously "On")'

Insert INTO MaintainsCarsFor ("Mercedes-AMG Petronas Formula 1 Team", 149, 6/15/2015, null)

Insert INTO MaintainsCarsFor ("Red Bull Racing", 240, 4/13/2020, null)

Insert INTO MaintainsCarsFor ("Scuderia Ferrari", 241, 9/28/2021, null)

Insert INTO MaintainsCarsFor ("McLaren F1 Team", 132, 7/1/2014, null)

Insert INTO MaintainsCarsFor ("Alpine F1 Team", 164, 12/15/2018, null)

Manages (Previously "On")

Insert INTO Manages (320, "Antônio", "French", 10/15/1983)

Insert INTO Manages (356, "Cristiano","French", 8/16/1993)

Insert INTO Manages (322, "Olivier", "British", 12/15/1980)

Insert INTO Manages (341, "Giorgio", "Italian", 12/15/1982)

Insert INTO Manages (275, "Gianmaria","Italian", 12/15/1981)

EngineersFor (Previously "On")

Insert INTO EngineersFor ("Mercedes-AMG Petronas Formula 1 Team", 1 10/28/2016, null)

Insert INTO EngineersFor ("Red Bull Racing", 14, 11/5/2019. null)

Insert INTO EngineersFor ("Scuderia Ferrari",11, 6/12/2017, null)

Insert INTO EngineersFor ("McLaren F1 Team",16, 1/29/2020, null)

Insert INTO EngineersFor ("Alpine F1 Team", 7, 7/14/2017, null)

Managers

Insert INTO Managers (320, "Antônio", "French", 10/15/1983)

Insert INTO Managers (356, "Cristiano","French", 8/16/1993)

Insert INTO Managers (322, "Olivier", "British", 12/15/1980)

Insert INTO Managers (341, "Giorgio", "Italian", 12/15/1982)

Insert INTO Managers (275, "Gianmaria","Italian", 12/15/1981)

ParticipatedIn

Insert INTO ParticipatedIn ("Mercedes-AMG Petronas Formula 1 Team ", 2022,2)

Insert INTO ParticipatedIn ("Red Bull Racing",   2022,1)

Insert INTO ParticipatedIn ("Scuderia Ferrari", 2022, 7)

Insert INTO ParticipatedIn ("McLaren F1 Team",   2022, 4)

Insert INTO ParticipatedIn ("Alpine F1 Team", 2022,   9)

DroveDuring

Insert INTO DroveDuring (149,   2022, 1)

Insert INTO DroveDuring (240,   2022,11)

Insert INTO DroveDuring (241,   2022,6)

Insert INTO DroveDuring (132,   2022,4)

Insert INTO DroveDuring (164,   2022,16)

Drivers

Insert INTO Drivers (149, "hamilton", "British" 1985-01-07 UK   7 15   5   285)

Insert INTO Drivers (240, "verstappen", "Dutch", 1977-05-10, "Netherlands", 1,   39, 7,   289)

Insert INTO Drivers (241,   "carlos", "Argentine", 1985-06-27, "Spain", 0,   65, 2,   213)

```
Insert INTO Drivers (132, "lando", "British", 1981-07-29, "Britan",
0,    51,   7,    126)

Insert INTO Drivers (164,   "ocon","French", 1981-10-19,    "France"
0,    68,   2,    69)
```

Raced

```
Insert INTO Raced (400,    149, 1)

Insert INTO Raced (401,    240, 7)

Insert INTO Raced (402,    241, 4)

Insert INTO Raced (403,    132, 2)

Insert INTO Raced (404,    164, 9)
```

Circuits

```
Insert INTO Circuits (Bahrain International Circuit
http://en.wikipedia.org/wiki/Bahrain_International_Circuit  4.3   cw
race track 63.4 Bahrain Grand Prix)

Insert INTO Circuits (Circuit de Barcelona-Catalunya
http://en.wikipedia.org/wiki/Circuit_de_Barcelona-Catalunya 5.2  cw
race track 45.2 Catalunya Grand Prix)

Insert INTO Circuits ("Istanbul Park",
"http://en.wikipedia.org/wiki/Istanbul_Park", 4.5, "cw", "race track",
30.5, "Istanbul Grand Prix")

Insert INTO Circuits ("Circuit de Monaco",
"http://en.wikipedia.org/wiki/Circuit_de_Monaco",5.5,  ccw,  street,
track 42,   "Monaco Grand Prix")

Insert INTO Circuits ("Circuit Gilles Villeneuve",
"http://en.wikipedia.org/wiki/Circuit_Gilles_Villeneuve",   5.6,
"ccw", "race track",  20.3, "Canadian Grand Prix")
```

GrandPrix

Insert INTO GrandPrix ("Bahrain Grand Prix",   "Bahrain")

Insert INTO GrandPrix ("Catalunya Grand Prix",   "Spain")

Insert INTO GrandPrix ("Istanbul Grand Prix",   "Turkey")

Insert INTO GrandPrix ("Monaco Grand Prix",   "Monaco")

Insert INTO GrandPrix ("Canadian Grand Prix",   "Canada")

InvestsIn

Insert INTO InvestsIn ("AMD Mercedes-AMG Petronas Formula 1 Team" , 6/15/2015, Null, 23,145,731.00)

Insert INTO InvestsIn ("Hewlett Packard Enterprise", "Mercedes-AMG", "Petronas Formula 1 Team, 4/13/2020, Null, 17,351,333.00)

Insert INTO InvestsIn ("Chrome", "McLaren F1 Team",   9/28/2021, Null, 21,050,104.00)

Insert INTO InvestsIn ("Dell",   "McLaren F1 Team ", 7/1/2014, Null, 16,632,288.00)

Insert INTO InvestsIn ("Goldman Sachs", "McLaren F1 Team", 12/15/2018, Null, 8,282,840.00)

InvestsInAmounts

Insert INTO InvestsInAmount (23,145,731.00, "platinum")

Insert INTO InvestsInAmount (17,351,333.00, "silver")

Insert INTO InvestsInAmount (21,050,104.00, "gold")

Insert INTO InvestsInAmount (16,632,288.00, "silver")

Insert INTO InvestsInAmount (8,282,840.00, "bronze")

Races

Insert INTO Races (400, 7/21/2020, 10, 1.4, "Porsche 914", 2, 149, 2020, "Bahrain International Circuit")

Insert INTO Races (401, 10/18/2022, 10, 2.3, "Lamborghini Countach", 6, 149, 2022, "Circuit de Barcelona-Catalunya")

Insert INTO Races (402, 12/17/2020, 17, 1.5, "Mercedes-AMG GT Black Series" , 3, 241, 2020, "Istanbul Park")

Insert INTO Races (403, 10/15/2021, 27, 1.9, "Lamborghini Diablo",7, 149, 2021, "Circuit de Monaco")

Insert INTO Races (404, 7/25/2021, 21, 3.4, "Mercedes-AMG GT Black Series", 4, 164, 2021, "Circuit Gilles Villeneuve")

SafetyCar

Insert INTO SafetyCar ("Porsche 914", 175)

Insert INTO SafetyCar ("Lamborghini Countach", 172)

Insert INTO SafetyCar ("Mercedes-AMG GT Black Series", 202)

Insert INTO SafetyCar ("Lamborghini Diablo", 201)

Insert INTO SafetyCar ("Mercedes-AMG GT Black Series", 224)

Seasons

Insert INTO SafetyCar (2016, 21)

Insert INTO SafetyCar (2017, 20)

Insert INTO SafetyCar (2018, 21)

Insert INTO SafetyCar (2019, 21)

Insert INTO SafetyCar (2020, 17)

carNumber	teamName	powerUnit	chassisModel	toDate	fromDate	driverID
1	Mercedes-AMG Petronas Formula 1 Team	Renault	MD34s	04-10-19	10-14-22	149
2	Red Bull Racing	Honda	RB2d7	12-11-18	10-15-22	240
3	Scuderia Ferrari	Ferrari	Frh9d	05-12-13	10-16-22	241
4	McLaren F1 Team	Mercedes	MLnw0	04-13-20	10-17-22	132
5	Alpine F1 Team	Renault	APjf8	04-14-21	10-18-22	164

carNumber	teamName	engineerID
1	Mercedes-AMG Petronas Formula 1 Team	1
2	Red Bull Racing	14
3	Scuderia Ferrari	11
4	McLaren F1 Team	16
5	Alpine F1 Team	7

engineerID	Name	nationality	dateOfBirth	placeOfBirth	Education Level
1	David	Honduran	5/22/1995	Honduras	Bachelor's or equivalent level
14	Jarno	Thai	4/13/1983	Canada	Post-secondary non-tertiary education
11	Mellisa	Haitian	10/5/1993	United States of America	Master's or equivalent level
16	Mark	Mongolian	8/10/1987	Philippines	Bachelor's or equivalent level
7	Jenson	Cuban	11/16/1994	Canada	Bachelor's or equivalent level

teamName	engineerID	fromDate	toDate
Mercedes-AMG I	1	10/28/2016	null
Red Bull Racing	14	11/5/2019	null
Scuderia Ferrari	11	6/12/2017	null
McLaren F1 Tear	16	1/29/2020	null
Alpine F1 Team	7	7/14/2017	null

carNumber	teamName	pitCrewID
1	Mercedes-AMG	22
2	Red Bull Racing	21
3	Scuderia Ferrari	27
4	McLaren F1 Tear	21
5	Alpine F1 Team	35

pitCrew	name	nationality	dateOfBirth	placeOfBirth	postition	bestTime
22	Samantha	German	12/1/1989	Germany	BR	2.36
21	Sam	Iranian	4/19/1993	Iran	BR	1.82
27	Lilly	Bulgarian	3/10/1990	United States of America	FL	2.2
21	Alex	Spanish	1/1/1986	Spain	FR	1.97
35	Heikki	Swedish	3/22/1984	Sweeden	BL	1.88

teamName	pitCrewID	fromDate	toDate
Mercedes-AMG Petronas Formula 1 Team	22	11/23/2016	null
Red Bull Racing	21	3/25/2021	null
Scuderia Ferrari	27	1/10/2019	null
McLaren F1 Team	21	12/17/2016	null
Alpine F1 Team	35	6/26/2019	null

managerID	name	nationality	dateOfBirth
320	Antônio	French	10/15/1983
356	Cristiano	French	8/16/1993
322	Olivier	British	12/15/1980
341	Giorgio	Italian	12/15/1982
275	Gianmaria	Italian	12/15/1981

name
AMD
Hewlett Packard Enterprise
Chrome
Dell
Goldman Sachs

InvestorName	teamName	startDate	endDate	amount
AMD	Mercedes-AMG Petronas Formula 1 Team	6/15/2015	Null	23,145,731.00
Hewlett Packard Enterprise	Mercedes-AMG Petronas Formula 1 Team	4/13/2020	Null	17,351,333.00
Chrome	McLaren F1 Team	9/28/2021	Null	21,050,104.00
Dell	McLaren F1 Team	7/1/2014	Null	16,632,288.00
Goldman Sachs	McLaren F1 Team	12/15/2018	Null	8,282,840.00

amount	level
23,145,731.00	platium
17,351,333.00	silver
21,050,104.00	gold
16,632,288.00	silver
8,282,840.00	bronze

teamName	baseLocation	owner	firstTeamEntry	fastestLaps	worldChampions
Mercedes-AMG Petronas Formula 1 Team	British	Johnson	6/19/1991	2	12
Red Bull Racing	German	Williams	6/5/1997	11	8
Scuderia Ferrari	British	Brown	8/11/1982	3	8
McLaren F1 Team	French	Jones	2/17/1994	8	10
Alpine F1 Team	Italian	Miller	11/27/1988	9	9

teamName	driverID	fromDate	toDate
Mercedes-AMG Petronas Formula 1 Team	149	6/15/2015	null
Red Bull Racing	240	4/13/2020	null
Scuderia Ferrari	241	9/28/2021	null
McLaren F1 Team	132	7/1/2014	null
Alpine F1 Team	164	12/15/2018	null

driverID	seasonYear	driverRank
149	2022	1
240	2022	11
241	2022	6
132	2022	4
164	2022	16

raceID	driverID	placement
400	149	1
401	240	7
402	241	4
403	132	2
404	164	9

year	races
2016	21
2017	20
2018	21
2019	21
2020	17

raceID	raceDate	temperature	fastestLap	safteyCarModel	DNFCount	poleSitterDriverID	seasonYear	circuitName
400	7/21/2020	10	1.4	Porsche 914	8	149	2020	Bahrain International Circuit
401	10/18/2022	10	2.3	Lamborghini Countach	1	149	2022	Circuit de Barcelona-Catalunya
402	12/17/2020	17	1.5	Mercedes-AMG GT Black Series	2	241	2020	Istanbul Park
403	10/15/2021	27	1.9	Lamborghini Diablo	2	149	2021	Circuit de Monaco
404	7/25/2021	21	3.4	Mercedes-AMG GT Black Series	7	164	2021	Circuit Gilles Villeneuve

safteyCarModel	SafetyCarTopSpeed
Porsche 914	175
Lamborghini Countach	172
Mercedes-AMG GT Black Series	202
Lamborghini Diablo	201
Mercedes-AMG GT Black Series	224

circuitName	mapURL	lastLength	direcion	type	changeInElevation	grandPrixTitle
Bahrain International Circuit	http://en.wikipedia.org/wiki/Bahrain_International_Circuit	4.3	cw	race track	63.4	Bahrain Grand Prix
Circuit de Barcelona-Catalunya	http://en.wikipedia.org/wiki/Circuit_de_Barcelona-Catalunya	5.2	cw	race track	45.2	Catalunya Grand Prix
Istanbul Park	http://en.wikipedia.org/wiki/Istanbul_Park	4.5	cw	race track	30.5	Instanbul Grand Prix
Circuit de Monaco	http://en.wikipedia.org/wiki/Circuit_de_Monaco	5.5	ccw	street track	42	Monaco Grand Prix
Circuit Gilles Villeneuve	http://en.wikipedia.org/wiki/Circuit_Gilles_Villeneuve	5.6	ccw	race track	20.3	Canadian Grand Prix

title	country
Bahrain Grand Prix	Bahrain
Catalunya Grand Prix	Spain
Instanbul Grand Prix	Turkey
Monaco Grand Prix	Monaco
Canadian Grand Prix	Canada

driverID	name	nationality	dateOfBirth	placeOfBirth	worldChampionships	podiums	fastestLaps	racesWon
149	hamilton	British	1985-01-07	UK	7	15	5	285
240	verstappen	Dutch	1977-05-10	Netherlands	1	39	7	289
241	carlos	Argentine	1985-06-27	Spain	0	65	2	213
132	lando	British	1981-07-29	Britan	0	51	7	126
164	ocon	French	1981-10-19	France	0	68	2	69

teamName	seasonYear	constructorRank
Mercedes-AMG Petronas Formula 1 Team	2022	2
Red Bull Racing	2022	1
Scuderia Ferrari	2022	7
McLaren F1 Team	2022	4
Alpine F1 Team	2022	9

managerID	name	nationality	dateOfBirth
320	Antônio	French	10/15/1983)
356	Cristiano	French	8/16/0199
322	Olivier	British	12/15/1980
341	Giorgio	Italian	12/15/1982
275	Gianmaria	Italian	12/15/1981