Ryerson University

Department of Electrical, Computer, & Biomedical Engineering
Faculty of Engineering & Architectural Science

Course Title:	Fundamentals of Data Engineering
Course Number:	COE 848
Semester/Year (e.g.F2016)	W2024

Instructor:	Dr. Faezeh Ensan

Assignment/Lab Number:	Lab 3
Assignment/Lab Title:	Database Design

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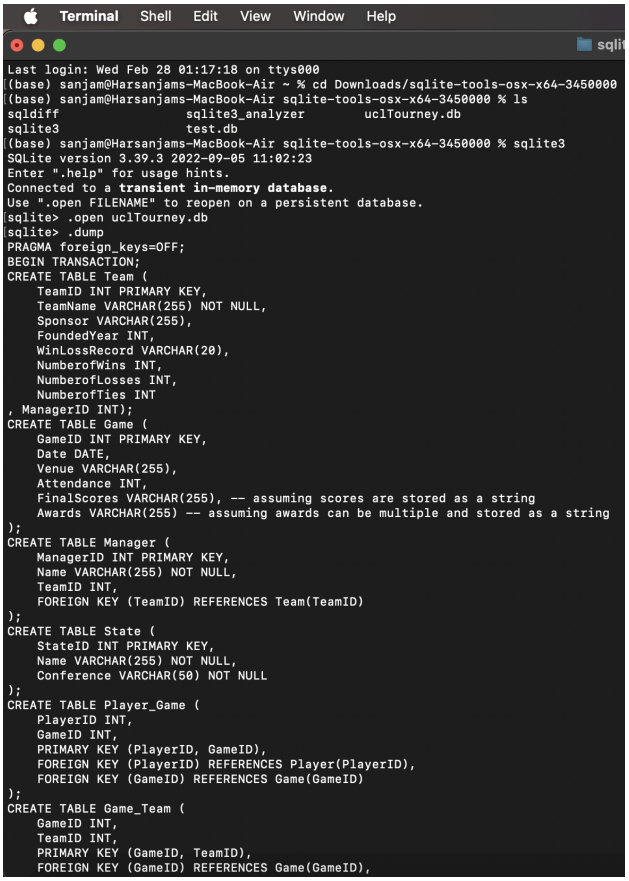
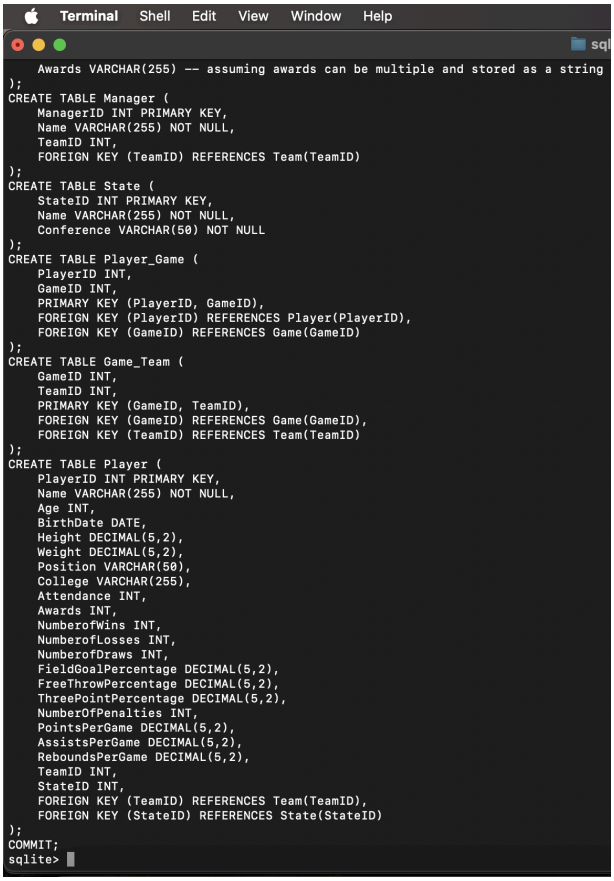
*By signing above you attest that you have contributed to this written lab report and confirm that all work you have contributed to this lab report is your own work. Any suspicion of copying or plagiarism in this work will result in an investigation of Academic Misconduct and may result in a "0" on the work, an "F" in the course, or possibly more severe penalties, as well as a Disciplinary Notice on your academic record under the Student Code of Academic Conduct, which can be found online at: http://www.ryerson.ca/senate/current/pol60.pdf

SQL Code for creating Tables:





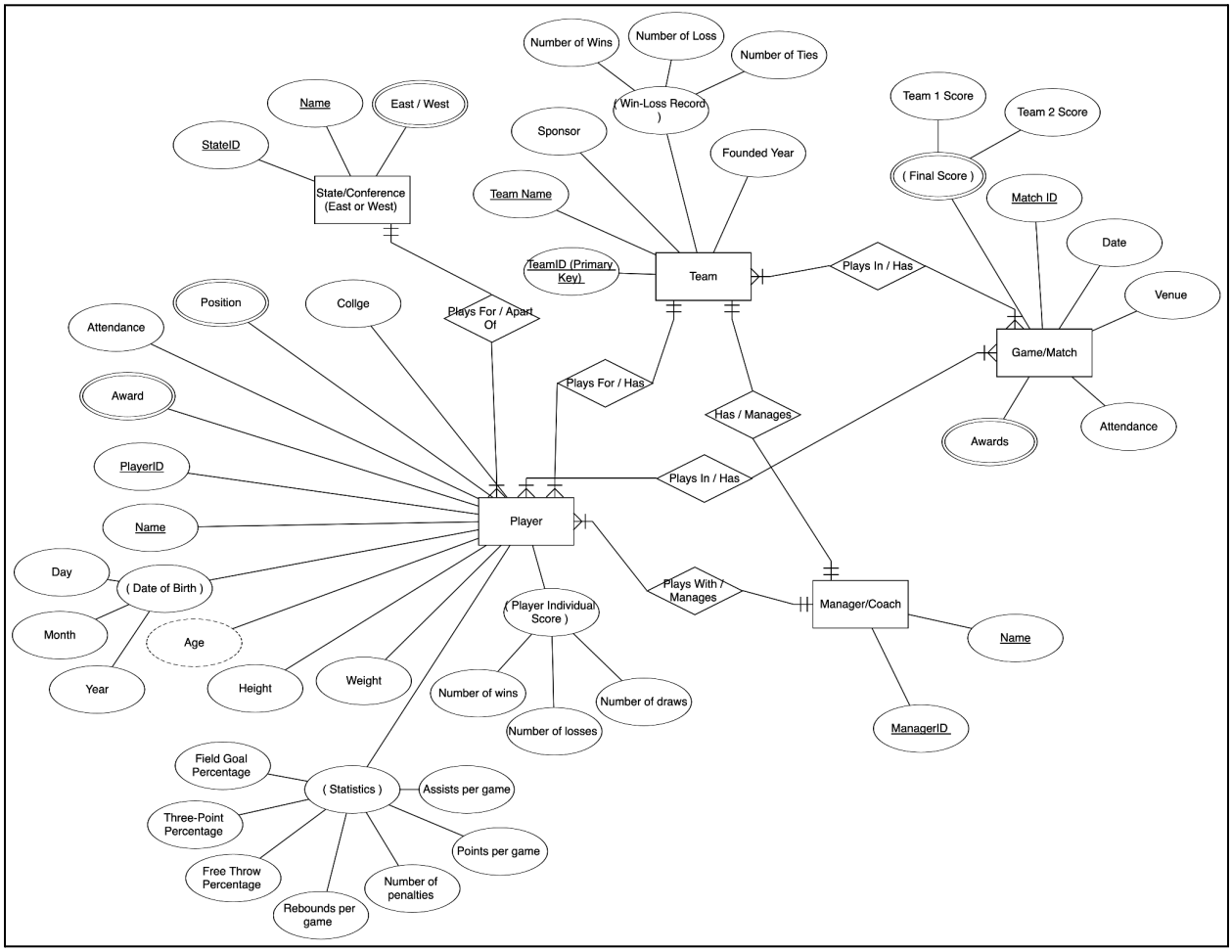

```
-- Player table
CREATE TABLE Player (
    PlayerID INT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL,
    Age INT,
    BirthDate DATE,
    Height DECIMAL(5,2),
    Weight DECIMAL(5,2),
    Position VARCHAR(50),
    College VARCHAR(255),
    Attendance INT,
    Awards INT,
    NumberofWins INT,
    NumberofLosses INT,
    NumberofDraws INT,
    FieldGoalPercentage DECIMAL(5,2),
```

```
    FreeThrowPercentage DECIMAL(5,2),
    ThreePointPercentage DECIMAL(5,2),
    NumberOfPenalties INT,
    PointsPerGame DECIMAL(5,2),
    AssistsPerGame DECIMAL(5,2),
    ReboundsPerGame DECIMAL(5,2),
    TeamID INT,
    StateID INT,
    FOREIGN KEY (TeamID) REFERENCES Team(TeamID),
    FOREIGN KEY (StateID) REFERENCES State(StateID)
);

-- Team table
CREATE TABLE Team (
    TeamID INT PRIMARY KEY,
    TeamName VARCHAR(255) NOT NULL,
    Sponsor VARCHAR(255),
    FoundedYear INT,
    WinLossRecord VARCHAR(20),
    NumberofWins INT,
    NumberofLosses INT,
    NumberofTies INT
);

-- Game table
CREATE TABLE Game (
    GameID INT PRIMARY KEY,
    Date DATE,
    Venue VARCHAR(255),
    Attendance INT,
    FinalScores VARCHAR(255), -- assuming scores are stored as a string
    Awards VARCHAR(255) -- assuming awards can be multiple and stored as a string
);

-- Manager/Coach table
CREATE TABLE Manager (
    ManagerID INT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL,
    TeamID INT,
    FOREIGN KEY (TeamID) REFERENCES Team(TeamID)
```

```
);

-- State/Division table
CREATE TABLE State (
    StateID INT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL,
    Conference VARCHAR(50) NOT NULL
);

-- Player to Game (Many-to-Many) relationship table
CREATE TABLE Player_Game (
    PlayerID INT,
    GameID INT,
    PRIMARY KEY (PlayerID, GameID),
    FOREIGN KEY (PlayerID) REFERENCES Player(PlayerID),
    FOREIGN KEY (GameID) REFERENCES Game(GameID)
);

-- Game to Team (Many-to-Many) relationship table
CREATE TABLE Game_Team (
    GameID INT,
    TeamID INT,
    PRIMARY KEY (GameID, TeamID),
    FOREIGN KEY (GameID) REFERENCES Game(GameID),
    FOREIGN KEY (TeamID) REFERENCES Team(TeamID)
);

-- Manager to Team (One-to-One) relationship table
ALTER TABLE Team ADD COLUMN ManagerID INT;
ALTER TABLE Team ADD FOREIGN KEY (ManagerID) REFERENCES
Manager(ManagerID);
```

.dump command

Entity Relationship Diagram



Database Structure:

Entities:

- **Player -** *A single Basketball player's information like name, age, personal stats, etc.*
- **Team -** *Represents a Basketball team's statistics such as the entire team score, number of Wins, Loss, Ranking, etc.*
- **Game/match -** *Stores data regarding the current season's games between 2 teams*
- **State/conference east or west -** *Contains information regarding the name of the State a player can participate in and which conference (East/West) it falls under.*
- **Coach/Manager -** *Holds information regarding the manager's name that a player plays with or the name of the entire team managed by the coach.*

Attributes:

- **Player:**
  - **PlayerID (Primary Key, INTEGER) -** Serves as the primary key, uniquely identifying each player.
  - **Name (VARCHAR 255) -** Identify the name of the player
  - **Age (INTEGER) -** How Old is the player
  - **BirthDate (DATE) -** What day, month, and year the player was born
  - **Height (DECIMAL) -** How tall the player is
  - **Weight (DECIMAL) -** How much does the player weight
  - **Position (VARCHAR 255) -** What position does the player play ()
  - **College (VARCHAR 255) -** What College did the player previously play for
  - **Attendance (INTEGER) -** How many matches did the player Participate in
  - **Awards (INTEGER) -** Total number of awards received by the player
  - **Player individual score:**
    - **NumberofWins (INTEGER) -** Represents the total number of wins achieved by a player.
    - **NumberofLosses (INTEGER) -** Indicates the total number of losses incurred by a player.
    - **NumberofDraws (INTEGER) -** Denotes the total number of draws or tied matches experienced by a player
  - **Statistics:**
    - **FieldGoalPercentage (DECIMAL) -** Reflects the proportion of successful field goals made by a player.
    - **FreeThrowPercentage (DECIMAL) -** Represents the ratio of successful free throws made by a player.
    - **ThreePointPercentage (DECIMAL) -** Indicates the percentage of successful three-point shots made by a player.
    - **NumberOfPenalties (INTEGER) -** Represents the total number of penalties incurred by a player or team.
    - **PointsPerGame (DECIMAL) -** Reflects the average number of points scored by a player per game.
    - **AssistsPerGame (DECIMAL) -** Indicates the average number of assists made by a player per game.
    - **ReboundsPerGame (DECIMAL) -** Denotes the average number of rebounds grabbed by a player per game.

- **Team:**
  - **TeamID (Primary Key, INTEGER) -** Serves as the unique identifier for each team in the database.

- **TeamName (VARCHAR 255) -** Represents the name of a basketball team.
- **Sponsor (VARCHAR 255) -** Primary sponsor of the team (brand or company name)
- **FoundedYear (INTEGER) -** Denotes the year in which the team was established or founded.
- **WinLossRecord (VARCHAR 20) -** Reflects the historical performance of the team, showing the number of wins and losses.
  - **NumberofWins (INTEGER) -** How many Matches a team won
  - **NumberofLoss (INTEGER) -** How many Matches a team lost
  - **NumberofTies (INTEGER) -** How many Matches a team draw

- **Game:**
  - **GameID (Primary Key, INTEGER) -** It is the primary key, uniquely identifying each game.
  - **Date (DATE) -** Represents the date on which the basketball game was held.
  - **Venue (VARCHAR 255) -** Indicates the location where the basketball game took place.
  - **Attendance (INTEGER) -** Denotes the number of spectators or audience members present at the game.
  - **FinalScores (INTEGER) -** Represent the scores achieved by each team participating in the game.
  - **Awards (INTEGER) -** Indicates any awards or recognitions conferred during or after the game.

- **Manager/Coach:**
  - **ManagerID (Primary Key, INTEGER) -** Serves as the unique identifier for each manager or coach in the database.
  - **Name (VARCHAR 255) -** Represents the name of the manager or coach associated with a basketball team.

- **State/Division (east or west conference)**
  - **StateID (Primary Key, INTEGER) -** Serves as the unique identifier for each state or division in the database.
  - **Name (VARCHAR 255) -** Represents the name of the state or division.
  - **Conference (VARCHAR 50)-** Indicates the conference to which the state or division belongs, such as East or West.

Relationships:

1. Player plays for Team (**Many-to-One**):
- A player can play for one team, but a team can have many players.

2. Players to match/game (**Many-to-Many**):
- A player can play multiple games/matches and a single match has many players
- PRIMARY KEY (PlayerID, GameID),
- FOREIGN KEY (PlayerID) REFERENCES Player(PlayerID),
- FOREIGN KEY (GameID) REFERENCES Game(GameID)

3. The game involves Teams (**Many-to-Many**):
- Multiple teams participate in a game, and a team can play in multiple games. Similarly, a game involves multiple teams.
- PRIMARY KEY (GameID, TeamID),
- FOREIGN KEY (GameID) REFERENCES Game(GameID),
- FOREIGN KEY (TeamID) REFERENCES Team(TeamID)

4. Managers can only one team (**One-to-One**)
- Manager can only coach a single team during a season and each team will have only one manager.

5. Manager to player is (**Many-to-One**)
- A manager can coach many players, but a player can only have one coach

6. Player to State/Division is (**Many-to-One**)
- A player can belong to one state/division but a state can have multiple players