Database Lab Report 8

Course: Database Management
Lab Number: *Lab #8*
Date: *2025-4-15*
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1. Objective

To continue developing your facility with the art and science of normalization

2. Lab Setup

A normalized brain

3. Procedure

Prompt:

You have been hired as a database consultant by EON productions to work in the casting department for the next James Bond film. They finally need a new Bond (thank Codd!) and want a database of actors, the movies in which they have appeared, and the director of those movies. They have collected the following data for your use:

Actor Data:
name, address, birth date, hair color, eye color, height in inches, weight, spouse name, favorite color, screen actors guild anniversary date

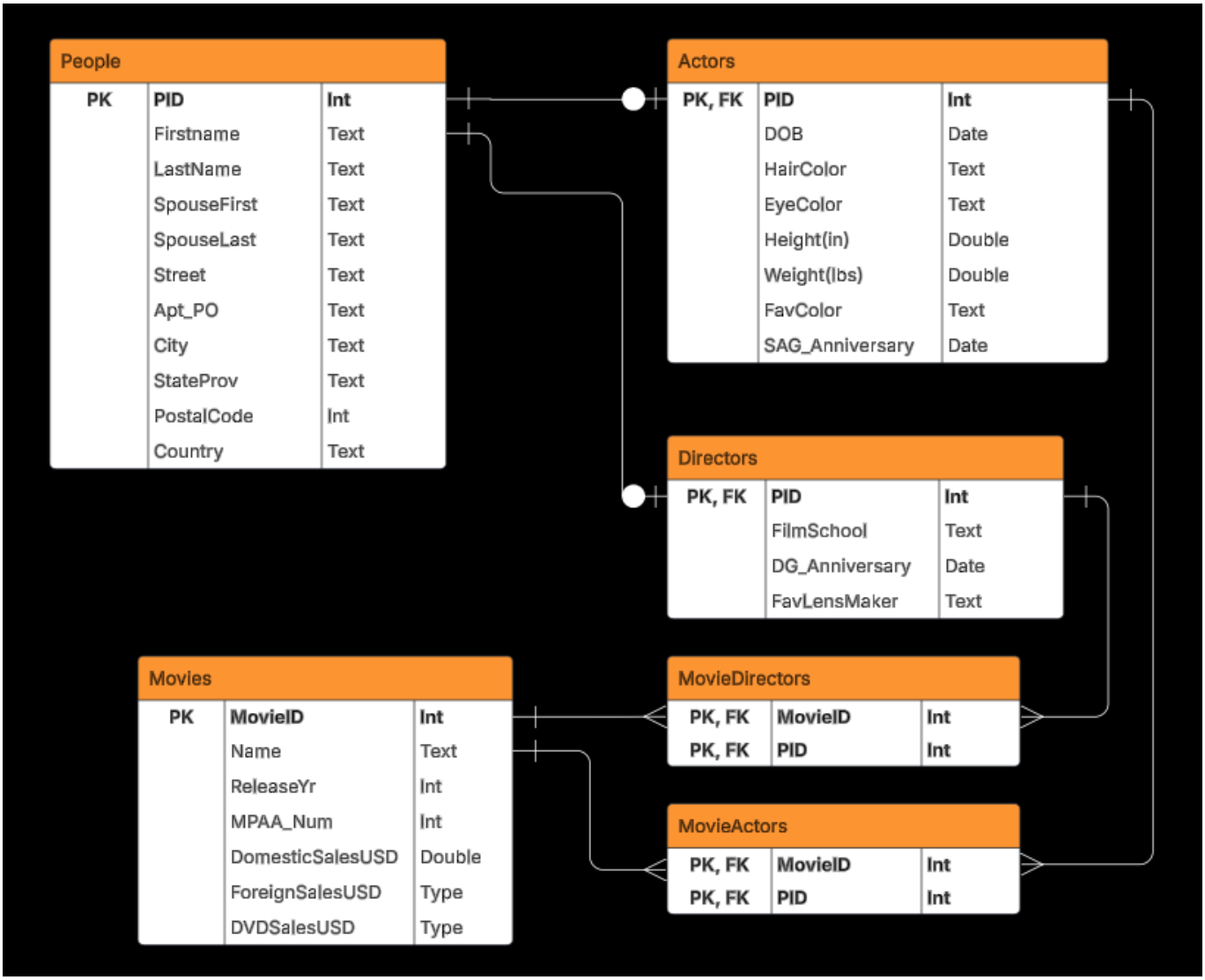
Movie Data
name, year released, MPAA number, domestic box office sales, foreign box office sales, DVD/Blu-ray sales

Director Data
name, address, spouse name, film school attended, directors guild anniversary date, favorite lens maker

Part 1:

Build this database. You may add or rename any fields you like. You must create a relational database in Boyce-Codd normal form (BCNF).

1. **Create a fully decorated and aesthetically beautiful E/R diagram**



2. **Write SQL create statements for each table**

Test Data is available in create-script.sql

```
CREATE TABLE People (
    PID INT NOT NULL,
    FirstName TEXT NOT NULL,
    LastName TEXT NOT NULL,
    SpouseFirst TEXT,
    SpouseLast TEXT,
    Street TEXT,
    Apt_PO TEXT,
    City TEXT,
    StateProv TEXT,
    PostalCode TEXT,
    Country TEXT,
  PRIMARY KEY (PID)
);

CREATE TABLE Actors (
```

```
    PID INT NOT NULL REFERENCES People(PID) ON DELETE CASCADE,
    DOB DATE,
    HairColor TEXT,
    EyeColor TEXT,
    Height_in DOUBLE PRECISION CHECK (Height_in > 0),
    Weight_lbs DOUBLE PRECISION CHECK (Weight_lbs > 0),
    FavColor TEXT,
    SAG_Anniversary DATE,
  PRIMARY KEY (PID)
);

CREATE TABLE Directors (
    PID INT NOT NULL REFERENCES People(PID) ON DELETE CASCADE,
    FilmSchool TEXT,
    DG_Anniversary DATE,
    FavLensMaker TEXT,
  PRIMARY KEY (PID)
);

CREATE TABLE Movies (
    MovieID INT NOT NULL,
    Title TEXT NOT NULL,
    ReleaseYr INT CHECK (ReleaseYr >= 1888), -- first ever movie
    MPAA_Num INT NOT NULL,
    DomesticSalesUSD DOUBLE PRECISION CHECK (DomesticSalesUSD >= 0),
    ForeignSalesUSD DOUBLE PRECISION CHECK (ForeignSalesUSD >= 0),
    DVDSalesUSD DOUBLE PRECISION CHECK (DVDSalesUSD >= 0),
  PRIMARY KEY(MovieID)
);

CREATE TABLE MovieActors (
    MovieID INT NOT NULL REFERENCES Movies(MovieID) ON DELETE CASCADE,
    PID INT NOT NULL REFERENCES Actors(PID) ON DELETE CASCADE,
    PRIMARY KEY (MovieID, PID)
);

CREATE TABLE MovieDirectors (
    MovieID INT NOT NULL REFERENCES Movies(MovieID) ON DELETE CASCADE,
    PID INT NOT NULL REFERENCES Directors(PID) ON DELETE CASCADE,
    PRIMARY KEY (MovieID, PID)
);
```

3. **List the functional dependencies for each table.**

People Table:

PID → FirstName, LastName, SpouseFirst, SpouseLast, Street, Apt_PO, City, StateProv, PostalCode, Country

Reasoning: PID, the primary key, uniquely identifies each person as well as determines all attributes of that person.

Actors Table:

PID → DOB, HairColor, EyeColor, Height_in, Weight_lbs, FavColor, SAG_Anniversary

Reasoning: PID, the primary key (which is also a foreign key referencing People), uniquely identifies actors and determines all of their attributes.

Directors Table:

PID → FilmSchool, DG_Anniversary, FavLensMaker

Reasoning: PID, the primary key (which is also a foreign key referencing People) uniquely identifies each director and all of their attributes.

Movies Table:

MovieID → Title, ReleaseYr, MPAA_Num, DomesticSalesUSD, ForeignSalesUSD, DVDSalesUSD

Reasoning: MovieID, the primary key, uniquely identifies each movie as well as determines all other attributes.

MovieActors Table:

MovieID, PID → *Nothing*

Reasoning: The combination of MovieID and PID (together they make the primary key) uniquely identifies the relationship between a movie and an actor. There are no other attributes present.

MovieDirectors Table:

MovieID, PID → *Nothing*

Reasoning: The combination of MovieID and PID (together they make the primary key) uniquely identifies the relationship between a movie and a director. There are no other attributes present.

4. **Write a query to show all the directors with whom actor “Roger Moore” has worked.**

I tested this query with Sean Connery from my test data. Don't worry, I didn't dox their addresses.

```
SELECT p.firstName || ' ' || p.lastName AS fullName, p.city, p.country,
d.filmSchool, d.dg_anniversary, d.favLensMaker
FROM People p INNER JOIN Directors d ON p.pid = d.pid
WHERE d.pid IN (
      SELECT pid
      FROM MovieDirectors
      WHERE movieID IN (
            SELECT movieID
            FROM MovieActors
            WHERE pid IN (
                  SELECT pid
                  FROM People
                  WHERE firstName = 'Roger' AND lastName = 'Moore'
                        )
                  )
               )
ORDER BY fullName ASC;
```