

IT-UNIVERSITY OF COPENHAGEN

BIDD

Assignment 01

Group: Godfather

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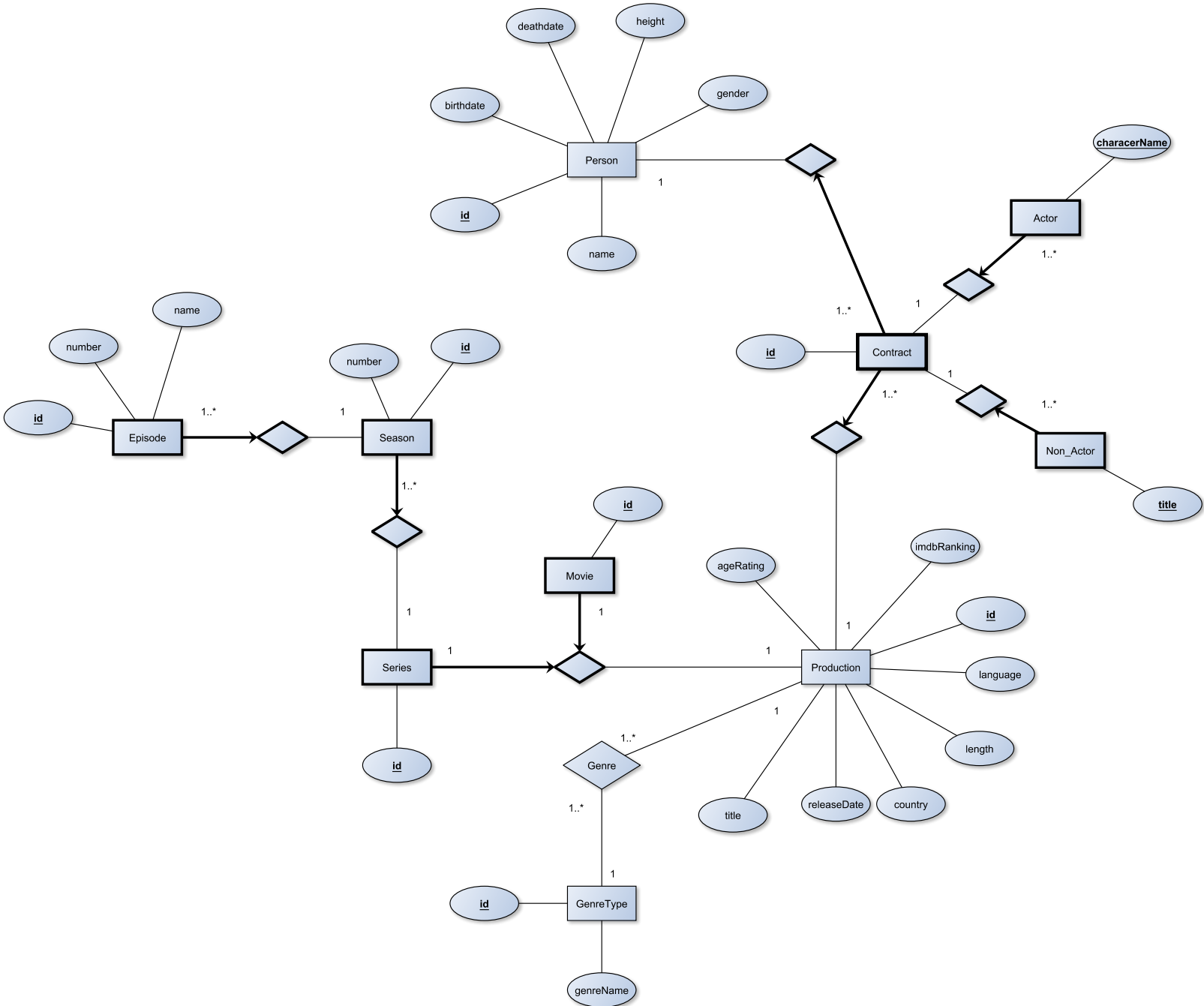
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1 ERD



2 SQL Schema

```
CREATE TABLE IF NOT EXISTS Production (  
    id INT AUTO.INCREMENT,  
    length DOUBLE,  
    title VARCHAR(80) NOT NULL,  
    releaseDate DATETIME,  
    country VARCHAR(50),  
    language VARCHAR(50),  
    imdbRating DOUBLE,  
    ageRating VARCHAR(4),  
    PRIMARY KEY (id)  
);
```

```
CREATE TABLE IF NOT EXISTS Person (  
    id INT AUTO.INCREMENT,  
    name VARCHAR(50) NOT NULL,  
    birthdate DATETIME,  
    deathdate DATETIME,  
    gender BOOLEAN,  
    height INT,  
    PRIMARY KEY (id)  
);
```

```
CREATE TABLE IF NOT EXISTS Contract (  
    id INT AUTO.INCREMENT,  
    personId INT,  
    productionId INT,  
    PRIMARY KEY (id),  
    FOREIGN KEY (personId) REFERENCES Person(id),  
    FOREIGN KEY (productionId) REFERENCES Production(id)  
);
```

```
CREATE TABLE IF NOT EXISTS Actor (  
    contractId INT,  
    characterName VARCHAR(50) NOT NULL,  
    PRIMARY KEY (contractId, characterName),  
    FOREIGN KEY (contractId) REFERENCES Contract(id)  
);
```

```
CREATE TABLE IF NOT EXISTS Non_Actor (  
    contractId INT,  
    title VARCHAR(50) NOT NULL,  
    PRIMARY KEY (contractId, title),  
    FOREIGN KEY (contractId) REFERENCES Contract(id)
```

```

);

CREATE TABLE IF NOT EXISTS GenreType (
    id INT AUTO.INCREMENT,
    genreName VARCHAR(25) NOT NULL,
    PRIMARY KEY (id)
);

CREATE TABLE IF NOT EXISTS Genre (
    productionId INT,
    genreTypeId INT,
    PRIMARY KEY (productionId, genreTypeId),
    FOREIGN KEY (productionId) REFERENCES Production(id),
    FOREIGN KEY (genreTypeId) REFERENCES GenreType(id)
);

CREATE TABLE IF NOT EXISTS Movie (
    id INT AUTO.INCREMENT,
    productionId INT,
    PRIMARY KEY (id),
    FOREIGN KEY (productionId) REFERENCES Production(id)
);

CREATE TABLE IF NOT EXISTS Series (
    id INT AUTO.INCREMENT,
    productionId INT,
    PRIMARY KEY (id),
    FOREIGN KEY (productionId) REFERENCES Production(id)
);

CREATE TABLE IF NOT EXISTS Season (
    id INT AUTO.INCREMENT,
    seriesId INT,
    PRIMARY KEY (id),
    FOREIGN KEY (seriesId) REFERENCES Series(id)
);

CREATE TABLE IF NOT EXISTS Episode (
    id INT AUTO.INCREMENT,
    seasonId INT,
    PRIMARY KEY (id),
    FOREIGN KEY (seasonId) REFERENCES Season(id)
);

```

3 Assumptions and choices

- A production is assumed to have a title.
- A person has a name.
- A person is either a man or a woman, represented as a value of either 1 or 0 respectively.
- A contract is made between a single person and a single production.
- A person can have several different roles within a production through various contracts. These roles are defined as either an actor or not an actor (e.g. writer or director).
- A production can have more than one genre.
- A production is either a movie or a series.
- The country of a production is determined by the origin of the producing film company.
- A series consists of one or more seasons, which consists of one or more episodes.

3.1 Extra notes

Genre

The relationship between the tables GenreType and Production is done with the Genre relationship, which contains references to the aforementioned tables' primary keys, as foreign key constraints. This could seem redundant as a lot of GenreTypes will reoccur in the Genre table but the alternative, which is not having the "Genre" relationship, would force us to repeat genre names multiple times as well as not allowing us to look up the genre types that can be associated with a production. Having the relationship adds this possibility and replaces the duplication of genre names with id values.

Production

It is possible that multiple attributes such as the 'country' attribute in the relation "Production" should be treated as we treated GenreType, but since it would involve the creation of several additional tables, which would exceed

the constraints of the assignment(maximum 15 tables) we have decided to showcase GenreType as an example of optimizing the schema.

Inheritance

The combination of the relations; Production, Movie, Series (hereunder Season and Episode), contributes to avoid a major amount of redundancy, as the alternative of storing loads of information in each table would introduce. This is solved by containing all common data fields in the Production relation, and having the previously mentioned Movie and Series tables relate to a single entry in the Production relation. Following this, Season and Episode contain little to none additional information, albeit a single Episode will usually have an individual name, setting it apart from the other episodes produced within the series.

4 Analysis of DBMS design

In every single relation in our ERD, every single attribute is functionally dependent on the "id" attribute, as it alone ensures that there can be no absolute duplicates. Simultaneously we need to control, that when not considering the id attribute's existence, that there can be no two entries, where the only attribute taking them apart from each other is the id attribute. Therefore we will go through and identify all possible candidate keys for all our relations, making sure that there is not two candidate keys, involving the same attribute more than once (Again: Excluding id from this candidate key search). Associated assumptions that would have to be made for a candidate key to be valid, will be mentioned in a column of its own. See the table below for the result of this relation search exhaustion.

;;TABLE;;

It doesn't make sense to go through any of the other tables, as pretty much all of them do not work independently, and are thus bound by their stored foreign keys being part of their primary key, making it trivial to look for possible candidate keys that could form functional dependencies.

In the case the above table doesn't implicitly clarified that our database design is in Boyce Codd normal form we've listed a few discussion points.

Relation	Functional Dependencies	(Related) Assumptions
Production attributes: <i>AgeRating, Title, ReleaseDate, Country, Length, Language, IMDBRating</i>	Title, ReleaseDate \rightarrow ... Title, Length \rightarrow ...	No 2 Productions with a sharing releasedate and title No 2 Productions with the same length and title
Person attributes: <i>Name, Gender, BirthDate Height, DeathDate</i>	Name, BirthDate \rightarrow ...	No 2 person share a name and a birthdate