Databases Project – Spring 2018

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# Deliverable 1

## Assumptions

We make the listed design decisions based on the following assumptions:

* *Actors, Writers, Producers, Directors* are not modelled as entities but as relations between entity *Person* and entity *Clip* because one *Person* can perform multiple jobs and we assume that queries become easier if the jobs are relations.
* *ReleaseDate* and *RunningTime* have been moved to a single entity since both describe additional information about a clip released in a country.
* *Biography* has been modelled as one entity since we don’t know the exact data yet which could justify a subdivision.
* We model *Country* as a separate entity to be able to describe other relations to *Country* like we do with the *released* relation.
* *Rating* is modelled as a weak entity since it is only associated to a single *Clip* (a *Rating* without an existing *Clip* does not make sense)
* *Biography* is also modelled as a weak entity (we cannot have a *Biography* for a non-existing *Person*)
* We consider the attribute “language” of entity *Language* a primary key because it is a unique and necessary attribute which cannot change.

## Entity Relationship Schema

### Schema



### Description

We apply the following constraints

Key Constraints:

* One *Biography* is only associated with one *Person*. A *Person* can have many *Biographies*. (One-to-Many)
* One *Rating* is associated to one *Clip*. A *Clip* can have many *Ratings*. (One-to-Many)
* Every other relation is modelled as many-to-many (e.g. every *Person* can direct, write, act or produce in many *Clips*. A *Clip* can have many producer, director, actor or writer.  Every *Clip* can have many *Countries* associated. A *Country* can be associated with many *Clips*. )
* In principle, a *Clip* should have at least one *Country* and at least one *Language* but we do not want to enforce this because we do not know the data yet.

Participation Constraints:

* Each *Rating* is assigned to exactly one *Clip*.
* Each *Biography* is assigned to exactly one *Person*
* Each *Language* and *Genres* must have at least one *Clip* to be relevant to this database.
* Every other relation participates partially (e.g. *Country*: A *Country* does not need to be associated with a *Clip* if it is a *Country* where a *Clip* is released. A *Clip* does not need to have a *Country* association)

## Relational Schema

### ER schema to Relational schema

The following describes how we translate the constraints

* Translating the many-to-many relationships “directed, acted, produced, wrote” we did not use a superkey as primary key (i.e. primary key(person\_id,clip\_id)) because this key does not allow for one person to act two different roles in the same clip.
* In contrast, translating the many-to-many relationships “clip\_country, clip\_genre, clip\_language” we use a superkey as primary key (e.g. primary key(clip\_id,genre\_id))
* The key constraints in “clip\_rating” and “biography” are enforced by setting the foreign key NOT NULL.

The following attributes are defined as unique:

* Country(country\_name)
* Genre(Genre)

### DDL

CREATE TABLE Person

(person\_id INTEGER,

fullname CHAR(20),

PRIMARY KEY (person\_id));

CREATE TABLE Clip

(clip\_id INTEGER,

clip\_type CHAR(20),

clip\_year DATE,

clip\_title CHAR(20),

PRIMARY KEY (clip\_id));

CREATE TABLE Directs

(person\_id INTEGER,

clip\_id INTEGER,

additional\_info CHAR(200),

role CHAR(20),

PRIMARY KEY (person\_id,clip\_id),

FOREIGN KEY (person\_id) REFERENCES Person(person\_id),

  FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id));

CREATE TABLE Acts

(person\_id INTEGER,

clip\_id INTEGER,

additional\_info CHAR(200),

orders\_credit CHAR(20),

character CHAR(20),

PRIMARY KEY (person\_id,clip\_id,character),

FOREIGN KEY (person\_id) REFERENCES Person(person\_id),

  FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id));

CREATE TABLE Produces

(person\_id INTEGER,

clip\_id INTEGER,

additional\_info CHAR(200),

role CHAR(20),

  PRIMARY KEY (person\_id,clip\_id),

FOREIGN KEY (person\_id) REFERENCES Person(person\_id),

  FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id));

CREATE TABLE Writes

(person\_id INTEGER,

clip\_id INTEGER,

additional\_info CHAR(200),

work\_type CHAR(20),

role CHAR(200),

PRIMARY KEY (person\_id,clip\_id),

FOREIGN KEY (person\_id) REFERENCES Person(person\_id),

  FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id));

CREATE TABLE ClipLinks

(clip\_from\_id INTEGER,

clip\_to\_id INTEGER,

link\_type CHAR(255),

PRIMARY KEY (clip\_from\_id,clip\_to\_id),

FOREIGN KEY (clip\_from\_id) REFERENCES Clip(clip\_id),

  FOREIGN KEY (clip\_to\_id) REFERENCES Clip(clip\_id));

CREATE TABLE Country

 (country\_id INTEGER,

 countryname CHAR(100),

 PRIMARY KEY(country\_id),

 constraint ux\_country unique(countryname));

CREATE TABLE Genre

(genre\_id INTEGER,

genre CHAR(20),

PRIMARY KEY (genre\_id),

constraint ux\_genre unique(genre));

CREATE TABLE Language

(language\_id INTEGER,

language CHAR(20),

PRIMARY KEY (language));

CREATE TABLE Clip\_country

(clip\_id INTEGER,

country\_id INTEGER,

PRIMARY KEY (clip\_id, country\_id),

FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id),

FOREIGN KEY (country\_id) REFERENCES Country(country\_id));

CREATE TABLE Clip\_genre

(clip\_id INTEGER,

genre\_id INTEGER,

PRIMARY KEY (clip\_id, genre\_id),

FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id),

FOREIGN KEY (genre\_id) REFERENCES Genre(genre\_id));

CREATE TABLE Clip\_language

(clip\_id INTEGER,

language\_id INTEGER,

PRIMARY KEY (clip\_id, language\_id),

FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id),

FOREIGN KEY (language) REFERENCES Language(language));

CREATE TABLE Clip\_rating

  (clip\_id INTEGER NOT NULL,

rating\_id INTEGER,

rank NUMBER(10),

votes NUMBER(10),

PRIMARY KEY (rating\_id),

FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id) ON DELETE CASCADE);

CREATE TABLE Released

(clip\_id INTEGER,

country\_id INTEGER,

release\_date DATE,

PRIMARY KEY (clip\_id, country\_id),

FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id),

FOREIGN KEY (country\_id) REFERENCES Country(country\_id));

CREATE TABLE Runs

(clip\_id INTEGER,

country\_id INTEGER,

running\_time NUMBER(10),

PRIMARY KEY (clip\_id, country\_id),

FOREIGN KEY (clip\_id) REFERENCES Clip(clip\_id),

FOREIGN KEY (country\_id) REFERENCES Country(country\_id));

CREATE TABLE Biography

(biography\_id INTEGER,

name CHAR(20),

realname CHAR(20),

nickname CHAR(20),

birth\_date DATE,

birth\_place CHAR(20),

height CHAR(20),

biography CHAR(400),

biographer CHAR(20),

death\_date DATE,

death\_place CHAR(20),

trivia CHAR(200),

biographicalbooks CHAR(100),

personalquotes CHAR(200),

salary CHAR(20),

trademark CHAR(20),

wherenow CHAR(200),

spouse\_id INTEGER,

person\_id INTEGER NOT NULL,

FOREIGN KEY (person\_id) REFERENCES Person(person\_id) ON DELETE CASCADE,

FOREIGN KEY (spouse\_id) REFERENCES Clip(person\_id),

PRIMARY KEY (biography\_id));

CREATE TABLE BiographicalBooks  
 (book\_id INTEGER,  
 biography\_id INTEGER NOT NULL,

title CHAR(100),

FOREIGN KEY (biography\_id) REFERENCES Clip(biography\_id),

PRIMARY KEY (book\_id));

## General Comments

Work allocation  
Cho : DDL commands

Poopalasingam : ER model

Reetz : revision and comments

# Deliverable 2

## Assumptions

<In this section write down the assumptions you made about the data. Write a sentence for each assumption you made>

## Data Loading

## Query Implementation

<For each query>

### Query a:

#### Description of logic:

<What does the query do and how do I decide to solve it>

#### SQL statement

<The SQL statement>

## Interface

### Design logic Description

<Describe the general logic of your design as well as the technology you decided to use>

### Screenshots

<Provide some initial screen shots of your interface>

## General Comments

<In this section write general comments about your deliverable (comments and work allocation between team members>

# Deliverable 3

# Assumptions

<In this section write down the assumptions you made about the data. Write a sentence for each assumption you made>

## Query Implementation

<For each query>

### Query a:

#### Description of logic:

<What does the query do and how do I decide to solve it>

#### SQL statement

<The SQL statement>

## Query Analysis

### Selected Queries (and why)

#### Query 1

<Initial Running time:

Optimized Running time:

Explain the improvement:

Initial plan

Improved plan>

#### Query 2

<Initial Running time:

Optimized Running time:

Explain the improvement:

Initial plan

Improved plan>

#### Query 3

<Initial Running time:

Optimized Running time:

Explain the improvement:

Initial plan

Improved plan>

# Interface

### Design logic Description

<Describe the general logic of your design as well as the technology you decided to use>

### Screenshots

<Provide some initial screen shots of your interface>

# General Comments

<In this section write general comments about your deliverable (comments and work allocation between team members>