Lecture 8: More on Joins

CS1106/CS6503– Introduction to Relational Databases

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Summary

More on joins.

Movies Database

cs1106 Goes to the Movies

Today we will get more practice with multi-table queris using the following simple film database

```
movies(id, title, yr, score, votes, director)
actors(id, name)
castings(movieid, actorid)
```

Movies and Actors tables

```
movies(id, title, yr, score, votes, director)
actors(id, name)
castings(movieid, actorid)
```

movies

id	unique id number for each movie
title	the name of the movie
yr	the year the movie was released
score	viewers rating (real number)
director	the name of the director

actors

id	unique id number for each actor
name	the actor's name

Castings Table

```
movies(id, title, yr, score, votes, director)
actors(id, name)
castings(movieid, actorid)
```

role

- "Bridges" movies and actors tables
- Models who appeared in what films

attributes

movieid	id number of some movie
actorid	id number of some actor

Signifies that the actor appeared in that movie

Target Practice

Query 1

Task List the maximum score obtained by any film(s) released during the 1960s.

Query 1

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Solution

```
SELECT MAX(score)
FROM movies
WHERE yr BETWEEN 1960 AND 1969;
```

Query 2

Task List for each year the total number of films released that year and the maximum, minimum and average score obtained.

Query 2

Task List for each year the total number of films released that year and the maximum, minimum and average score obtained.

Solution

```
SELECT yr, COUNT(*), MIN(score), AVG(score), MAX(score)
FROM movies
GROUP BY yr;
```

Query 3

Task List the ids of all films starring Cary Grant.

Query 3

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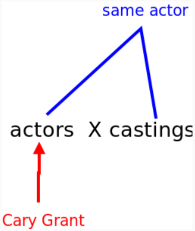
Issues

- Need both `actors` and `castings` tables



Query 3 cont'd

Task List the ids of all films starring Cary Grant.

Solution

```
SELECT movieid
FROM
    actors JOIN castings
    ON id = actorid
WHERE name = 'Cary Grant';
```

Query 4

Task List the titles of all the films made by the director of "Vertigo".

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Issues

- Need pairs of movies: self-join of `movies` with itself

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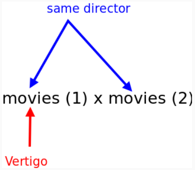

Query 4 cont'd

Task List the titles of all the films made by the director of "Vertigo".

Solution

```
SELECT m2.title
FROM
    movies AS m1
    JOIN movies as m2
    ON m1.director = m2.director
WHERE m1.title = 'Vertigo';
```

Query 5

Task List alphabetically the names of all the actors who appeared in any film released in 1950.

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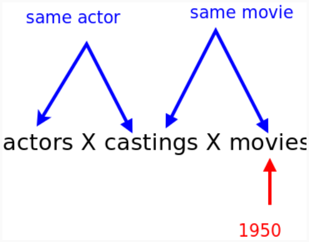
Issues

- Need actor-casting-movies triples :



Query 5 cont'd

Task List alphabetically the names of all the actors who appeared in any film released in 1950.

Solution

```
SELECT actors.name, movies.title, movies.yr
FROM
  actors JOIN castings JOIN movies
  ON actors.id = castings.actorid
     AND castings.movieid = movies.id
WHERE movies.yr = 1950
ORDER BY actors.name;
```

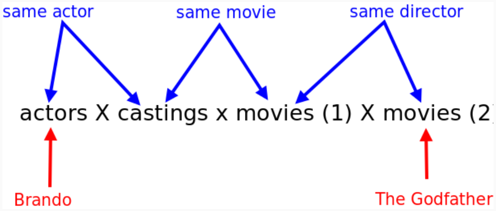
Query 6

Task List all the films in which Marlon Brando stars that were directed by the director of “The Godfather”; list the titles and years of the films concerned, arranged in increasing order by year.

Plan

- Can use (3-way) join to generate all appearances (actor-casting-movie) by Brando
- Use 4-way join ((actor-casting-movie)-movie) to generate appearance-movie combinations and filter for Coppola

Query 6 cont'd



Query 6 cont'd

Task List all the films in which Marlon Brando stars that were directed by the director of "The Godfather"; list the titles and years of the films concerned, arranged in increasing order by year.

Solution

```
SELECT m1.title, m1.yr
FROM
    actors AS a1
    JOIN castings AS c1
    JOIN movies AS m1
    JOIN movies AS m2
    ON a1.id = c1.actorid
        AND c1.movieid = m1.id
        AND m1.director = m2.director
WHERE
  m2.title = 'Godfather, The'
  AND a1.name = 'Marlon Brando'
ORDER BY m1.yr;
```

Query 7

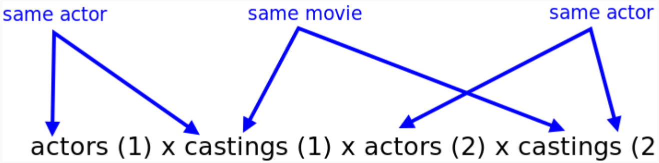
Task List the names of all pairs of actors that have appeared together in more than four films.

Issues

- Use join to generate all “co-appearances”: pairs of actor-castings relating to same film
- Use grouping and aggregation on join table for counting

Query 7 cont'd

Task List the names of all pairs of actors that have appeared together in more than four films.



Query 7 cont'd

Task List the names of all pairs of actors that have appeared together in more than four films.

Solution

```
SELECT a1.name, a2.name, COUNT(*)
FROM
  actors AS a1
  JOIN castings AS c1
  JOIN actors AS a2
  JOIN castings as c2
  ON a1.id = c1.actorid
    AND a2.id = c2.actorid
    AND a1.id < a2.id
    AND c1.movieid = c2.movieid
GROUP BY a1.name, a2.name
HAVING COUNT(*) > 4
ORDER BY COUNT(*) DESC;
```

Query 8

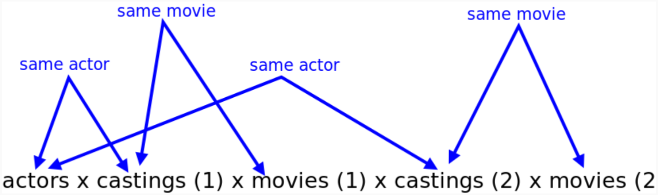
Task List alphabetically all the actors who have appeared in a film with a score below 3.0 and also in a film with a score above 8.5.

Issues

- Use join to genetate actor-appearance1-appearance2 tuples
- (where appearances1/appearances2 relate to actor)
- Filter to ensure appearance1 is a bad film (< 3.0) and
- Filter to ensure appearance2 is a good film (> 8.5) and

Query 8

List alphabetically all the actors who have appeared in a film with a score below 3.0 and also in a film with a score above 8.5.


same movie
same actor
same actor
same movie
actors x castings (1) x movies (1) x castings (2) x movies (2

Query 8 cont'd

Task List alphabetically all the actors who have appeared in a film with a score below 3.0 and also in a film with a score above 8.5.

Solution

```
SELECT DISTINCT a.name
  actors AS a JOIN
  castings AS c1 JOIN
  movies AS m1 JOIN
  castings AS c2 JOIN
  movies AS m2 JOIN
  ON
    a.id = c1.actorid AND
    a.id = c2.actorid AND
    m1.id = c1.movieid AND
    m2.id = c2.movieid
WHERE
  m1.score < 3.0 AND m2.score > 8.5
ORDER BY a.name;
```

Notes and Acknowledgements