Lecture 3 - Relational Algebra - Query Examples

1 Division Operator Examples

1. Consider R:

A	B	C
a_1	b_1	c_1
a_2	b_1	c_1
a_1	b_2	c_1
a_1	b_2	c_2
a_2	b_1	c_2
a_1	b_2	c_3
a_1	b_2	c_4
a_1	b_1	c_5

and S:

C
c_1

2. We want $R \div S$

3. Consider R:

A	B	C
a_1	b_1	c_1
a_2	b_1	c_1
a_2	b_1	c_2
a_1	b_2	c_3
a_1	b_2	c_1
a_1	b_2	c_2
a_1	b_2	c_4
a_1	b_1	c_5

and S:

C
c_1
c_2

4. We want $R \div S$

2 The Movie schema

Consider the schema below, consisting of three relations. The key attributes are underlined.

- `Movies(mID, title, director, year, length)`.

That is, the ID, the title, the director of a movie, the year when it was released and its length.

- `Artists(aID, aName, nat)`.

That is, the ID and the name of an artist and his/hers nationality.

- `Roles(mID, aID, character)`.

That is, the ID of a movie in which an artist (aID) played a character.

The following inclusion dependency hold:

- Roles[mID] $\subseteq$ Movies[mID]
- Roles[aID] $\subseteq$ Artists[aID]

Consider an instance of these three relations:

Movies:

mID	title	director	year	length
1	Shining	Kubrick	1980	146
2	Player	Altman	1992	146
3	Chinatown	Polanski	1974	131
4	Repulsion	Polanski	1965	143
5	Star Wars IV	Lucas	1977	126
6	American Graffiti	Lucas	1973	110
7	Full Metal Jacket	Kubrick	1987	156

Artists:

aID	aName	nat
1	Nicholson	American
2	Ford	American
3	Stone	British
4	Fisher	American

Roles:

mID	**aID**	**character**
1	1	Jack Torrance
3	1	Jake 'J.J.' Gittes
1	3	Delbert Grady
5	2	Han Solo
6	2	Bob Falfa
5	4	Princess Leia Organa

3 Query Examples

1. Find the names of actors who played in all movies.

2. Find the names of actors who played in all movies directed by Lucas.

3. Find the titles of the movies in which all the actors have the same nationality.