

Unary Operations: SELECT and PROJECT operations

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Give an expression in the relational algebra as well as the corresponding SQL statement, for each of the following queries,

Q1: show films which length \geq 184 minutes

$\sigma_{\text{length} \geq 184}$ (film)

SELECT * FROM film WHERE length \geq 184;

Q2: show films which not released in 2006

$\sigma_{\text{release_year} \neq 2006}$ (film)

SELECT * FROM film WHERE release_year \neq 2006;

Q3: show films which rating in the list of values ('G','NC-17')

$\sigma_{\text{rating} \in \{'G','NC-17'\}}$ (film)

SELECT * FROM film WHERE rating IN ('G','NC-17');

Q4: show films which rating not in the list of values ('G','NC-17')

$\sigma_{\text{rating} \notin \{'G','NC-17'\}}$ (film)

SELECT * FROM film WHERE rating NOT IN ('G','NC-17');

Q5: show films which title starts with letters 'Ti'

$\sigma_{\text{title starts with 'Ti'}}$ (film)

SELECT * FROM film WHERE title LIKE 'Ti%';

Q6: show films which title includes with the string character 'Grail'

$\sigma_{\text{title includes 'Grail'}}$ (film)

SELECT * FROM film WHERE title LIKE '%Grail%';

Q7: show all rental which return_date are in the 1st week of June 2005

σ return_date >= '2005-06-01 00:00:00' \wedge return_date <= '2005-06-07 00:00:00' (rental)

SELECT * FROM rental WHERE return_date BETWEEN '2005-06-01 00:00:00' AND '2005-06-07 00:00:00' ;

Q8: show title and release_year of all films

Π title, release_year (film)

SELECT title, release_year FROM film;

Q9: show title and release_year of all films which length is >= 180 minutes

Π title, release_year (σ length >= 180 (film))

SELECT title, release_year FROM film WHERE length >= 184;

Q10: show title and release_year of all films which length is >= 184 minutes and language_id different than 2

Π title, release_year (σ length >= 180 \wedge language_id \neq 2 (film))

SELECT title, release_year FROM film WHERE length >= 184 AND language_id \neq 2;

Q11: show country_id of Canada in Country Table

Π country_id (σ country = 'Canada' (country))

SELECT country_id FROM country WHERE country = 'Canada';

Q12: show customer_id and email of canadian customers

Π customer_id, email (σ address_id \in (Π address_id (σ city_id \in (Π city_id (σ country_id = 20 (city)))) (address)) (country))

SELECT customer_id, email
FROM customer
WHERE address_id IN (SELECT address_id
FROM address
WHERE city_id IN (SELECT city_id
FROM city
WHERE country_id = 20));