

CSCI 5333 DBMS Spring 2020

Suggested Solution for HW #3

(1) For examples:

(a)

```
PROJECT [title] (SELECT [rating='PG' AND length>180] (film));
```

(b)

```
PROJECT [title]
(film JOIN (PROJECT [film_id] (SELECT [actor_id = 148] (film_actor))));
```

(c)

```
PROJECT [title]
((SELECT [length>180] (film))
JOIN
  (PROJECT [film_id]
   (film_category JOIN
    (PROJECT [category_id]
     (SELECT [name = 'Comedy'] (category))))));
```

(d)

```
(PROJECT [title] (film JOIN PROJECT [film_id] (SELECT [actor_id = 1] (film_actor))))
UNION
(PROJECT [title] (film JOIN PROJECT [film_id] (SELECT [actor_id = 17] (film_actor))));
```

(e)

```
PROJECT [title]
(film JOIN
  ((PROJECT [film_id] (film))
  minus
  (PROJECT [film_id]
   (inventory JOIN
    (PROJECT [inventory_id] (rental))))));
```

(f)

```
PROJECT [title]
(film JOIN
  (PROJECT [film_id]
  (INVENTORY
  JOIN
  ((PROJECT [inventory_id] (inventory))
  MINUS
  (PROJECT [inventory_id] (rental))))));
```

(2) For examples:

(a) $\pi_{\text{title}} (\sigma_{\text{rating} = \text{'PG'}} \text{ and length} \geq 180 (\text{film}))$

(b) $\pi_{\text{title}} (\text{film} \mid x \mid \pi_{\text{film_id}} (\sigma_{\text{actor_id}=148} (\text{film_actor})))$

(c) $\pi_{\text{title}} (\sigma_{\text{length} \geq 180} (\text{film}) \mid x \mid \pi_{\text{film_id}} (\text{film_category} \mid x \mid \pi_{\text{category_id}} (\sigma_{\text{name}=\text{'Comedy'}} (\text{category}))))$

(d) $\pi_{\text{title}} (\text{film} \mid x \mid \pi_{\text{film_id}} (\sigma_{\text{actor_id} = 1 \vee \text{actor_id} = 17} (\text{film_actor})))$

(e) $\pi_{\text{title}} (\text{film} \mid x \mid (\pi_{\text{film_id}} (\text{film}) - \pi_{\text{film_id}} (\text{inventory} \mid x \mid \pi_{\text{inventory_id}} (\text{rental}))))$

(f) $\pi_{\text{title}} (\text{film} \mid x \mid (\pi_{\text{film_id}} (\text{inventory} \mid x \mid (\pi_{\text{inventory_id}} (\text{inventory}) - \pi_{\text{inventory_id}} (\text{rental}))))$