CS 317 Quiz 2 – Relational Algebra and SQL

Friday, Aug 10th

Note: ANY COPYING WILL RESULT IN A FAIL GRADE

Consider the following relational schema describing a movie database (this schema is extracted from the book *Foundations of Database* by S. Abiteboul, R. Hull and V. Vianu).

```
Schedule(Theater, Title, Time)
Movies(Title, Director, Actor)
Produced(Producer, Title)
See(Spectator, Title)
Liked(Spectator, Title)
```

A movie is directed by only one director but can be produced by several Producers. A spectator may like a movie without having seen it.

Write the following 2 queries in both Relational Algebra and SQL. In relational algebra you must use the expression form and are **not** allowed to use linear sequence or expression trees. You are also NOT allowed renaming of *relations*. You may use renaming of attributes. You may use numerical comparisons (e.g. ≥) in both SQL and Relational Algebra.

List the theater name and time where I can see the movie "Shrek" after 3pm.

$$\Pi_{theater,time}(\sigma_{(title='\text{Shrek}')\wedge(time\geq 18)}(Schedule))$$

```
SELECT theater, time
FROM Schedule
WHERE title = 'Shrek' AND time >= '15:00:00'
```

List the producers who produced a movie that does not appear in a theater.

$$\Pi_{Producer}(Produced \bowtie (\Pi_{title}(Movies) - \Pi_{title}(Schedule))$$

```
SELECT Producer
FROM Produced
WHERE title IN (SELECT title
                  FROM MOVIES
                      EXCEPT
                  SELECT title
                  FROM Schedule
                )
```

List people who liked movies that they have not seen.

$$\Pi_{spectator}(Liked - See)$$

```
SELECT Spectator
FROM (SELECT Spectator, Title
        FROM Liked
            EXCEPT
        SELECT Spectator, Title
        FROM See
       )
```