**Assignment 2**

EECS341 Spring 2019  
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Due: Tuesday, Feb 12, 2019

**1. Find the name and email of users who have made at least one post**

\prod\_{user.name,~user.email} (\sigma\_{user.login~=~post.login}(user \times post))∏*user*.*name*, *user*.*email*​(*σuser*.*login* = *post*.*login*​(*user*×*post*))

**2. Find the topic name, topic description, and subject of all posts and replies.**

\prod\_{topic.name,~topic.description,~post.subject} (\sigma\_{topic.name~=~post.topic\\_name}(topic \times post))∏*topic*.*name*, *topic*.*description*, *post*.*subject*​(*σtopic*.*name* = *post*.*topic*\_*name*​(*topic*×*post*))

**3. Find the name of users who have only posted in the topic “Computer Science”.**

For this problem, what we want is simply the **difference** between **name of all of the users who have posted in topic "Computer Science"** and **name of users who have posted in topic other than "Computer Science"**. We obtain the set of name of users who have only posted in the topic "Computer Science" by taking the difference as below:

\prod\_{user.name} (\sigma\_{post.topic\\_name~=~'Computer Science'~\wedge~user.login~=~post.login}(user \times post))~-~∏*user*.*name*​(*σpost*.*topic*\_*name* = ′*ComputerScience*′ ∧ *user*.*login* = *post*.*login*​(*user*×*post*)) −   
\prod\_{user.name} (\sigma\_{user.login~=~post.login}(user \times (post - \sigma\_{post.topic\\_name~=~'Computer Science'}(post))))∏*user*.*name*​(*σuser*.*login* = *post*.*login*​(*user*×(*post*−*σpost*.*topic*\_*name* = ′*ComputerScience*′​(*post*))))

**4. Translate from sql to relational algebra:**

SELECT u.name, p.subject, p.content

FROM post p, user u

WHERE p.login = u.login

AND u.name = ‘Finnegas’

AND p.timestamp < ‘2019-01-01’

\prod\_{u.name,~p.subject,~p.content} (\sigma\_{p.login~=~u.login~\wedge~u.name~=~'Finnegas'~\wedge~p.timestamp~<~'2019-01-01'}(\rho\_{u}(user) \times \rho\_{p}(post)))∏*u*.*name*, *p*.*subject*, *p*.*content*​(*σp*.*login* = *u*.*login* ∧ *u*.*name* = ′*Finnegas*′ ∧ *p*.*timestamp* < ′2019−01−01′​(*ρu*​(*user*)×*ρp*​(*post*)))

**5. Translate from sql to relational algebra:**

SELECT \* FROM (SELECT \* FROM topic) t

Basically the two SELECT \* FROM syntax did not alter the set topic, so the outcome we finally get is simply renaming topic as t as below:  
\rho\_{t}(topic)*ρt*​(*topic*)