Last Name: Sharma   First Name: Kavya   Student ID: W1619309
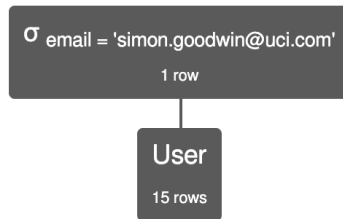
1. [10pts] Find all users whose email is 'simon.goodwin@uci.com'.

a) [6pts] Relational Algebra
   σ email = 'simon.goodwin@uci.com' (User)

b) [1pt] Parse Tree

σ email = 'simon.goodwin@uci.com' (User)

Execution time: 1 ms
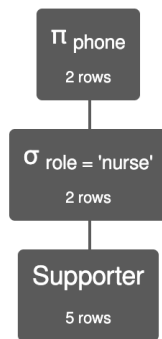
c) [3pts] Result (1 Row)

User.phlid	User.email	User.pswd
'4'	'simon.goodwin@uci.com'	'9e70aba2e1bd50759076052327368995'

2. [10pts] List the phones of Supporters who have the role of 'nurse'.

   a) [6pts] Relational Algebra
      π phone (σ role = 'nurse'(Supporter))

   b) [1pt] Parse Tree

$$\pi_{phone} (\sigma_{role = 'nurse'} (\text{Supporter}))$$

Execution time: 2 ms

c) [3pts] Result (2 Rows)

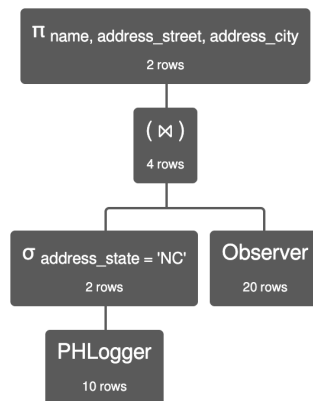| Supporter.phone |
| --- |
| '(148) 250-5706' |
| '895.815.0501' |

3. [10pts] List the name, street, and city of PHLoggers who reside in the state of 'NC' and are associated with an Observer.

   a) [6pts] Relational Algebra

   π name, address_street, address_city (σ address_state = 'NC' (PHLogger) $\bowtie$ Observer)

   b) [1pt] Parse Tree

π name, address_street, address_city (σ address_state = 'NC' (PHLogger) $\bowtie$ Observer)

Execution time: 2 ms

   c) [3pts] Result (2 Rows)

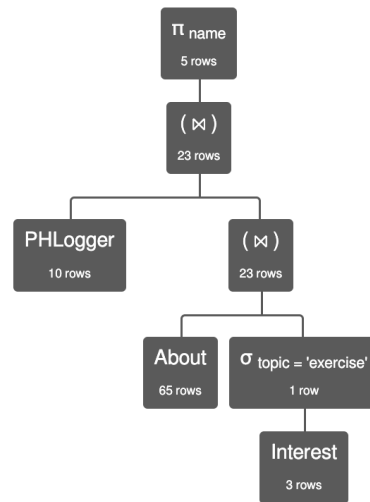| PHLogger.name	PHLogger.address_street	PHLogger.address_city
'Laree Schamberger'	'Alexander Cape'	'Beerview'
'Simon Goodwin'	'Ranae Pine'	'South Ashleymouth'

4. [15pts] List the names of PHLoggers who have a thought about an interest group with topic 'exercise'.

a) [9pts] Relational Algebra

π name (PHLogger $\bowtie$ (About $\bowtie$ (σ topic = 'exercise' (Interest))))

b) [3pt] Parse Tree

π_{name} (PHLogger $\bowtie$ (About $\bowtie$ ($\sigma_{topic = 'exercise'}$ (Interest))))

Execution time: 2 ms

c) [3pts] Result (5 Rows)
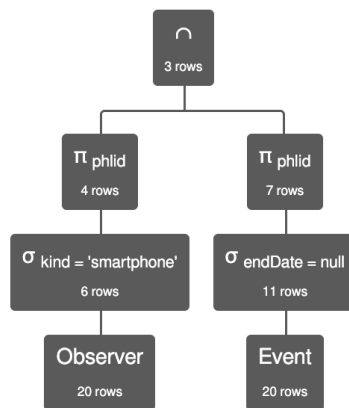
PHLogger.name
'Hannah Veum'
'Gilbert Nienow'
'Hans Ratke'
'Dustin Schmidt'
'Katrina Leannon'

5. [15pts] Find the phlids of PHLoggers who own an Observer of kind 'smartphone' and are associated with an event that doesn't have an end date.

a) [9pts] Relational Algebra

π phlid (σ kind = 'smartphone' (Observer)) $\cap$ π phlid(σ endDate = NULL (Event))

b) [3pt] Parse Tree

$\pi_{phlid} (\sigma_{kind = 'smartphone'} (Observer)) \cap \pi_{phlid} (\sigma_{endDate = null} (Event))$

Execution time: 1 ms

c) [3pts] Result (3 Rows)

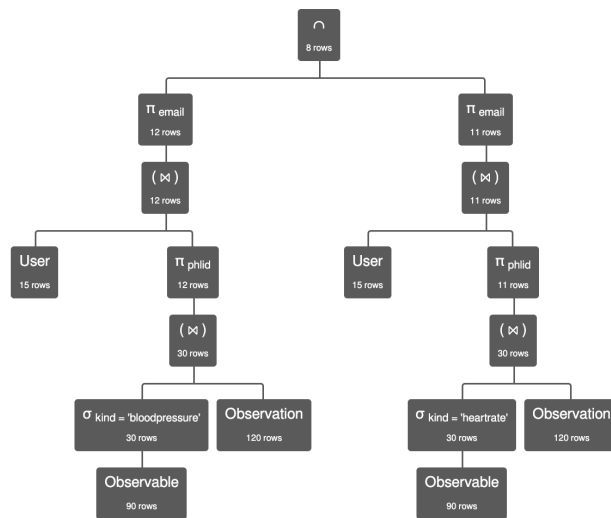| Observer.phlid |
| --- |
| '4' |
| '9' |
| '7' |

6. [20pts] List the emails of users who are associated with an Observable of kind 'bloodpressure' as well as an Observable of kind 'heartrate'.

a) [12pts] Relational Algebra

π email (User ⋈ (π phlid (σ kind = 'bloodpressure'(Observable) ⋈ Observation))) ∩
π email (User ⋈ (π phlid (σ kind = 'heartrate'(Observable) ⋈ Observation)))

b) [5pt] Parse Tree

π $_{email}$ (User ⋈ (π $_{phlid}$ (σ $_{kind = \text{'bloodpressure'}}$ (Observable) ⋈ Observation))) ∩ π $_{email}$ (User ⋈ (π $_{phlid}$ (σ $_{kind = \text{'heartrate'}}$ (Observable) ⋈ Observation)))

Execution time: 4 ms
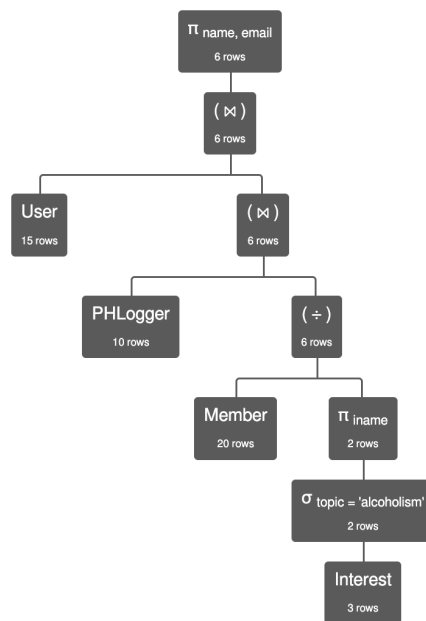
c) [3pts] Result (8 Rows)

User.email
'laree.schamberger@uci.com'
'hannah.veum@uci.com'
'titus.luettgen@uci.com'
'sadie.beer@uci.com'
'gilbert.nienow@uci.com'
'jamey.brown@uci.com'
'ricky.deckow@uci.com'
'katrina.leannon@uci.com'

7. [20pts] List the names and emails of PHLoggers who are members of all available interest groups with the topic of 'alcoholism'.

a) [12pts] Relational Algebra (Hint: **Use Division!**)

π name, email (User $\bowtie$ (PHLogger $\bowtie$ (Member $\div$ π iname σ topic = 'alcoholism' (Interest))))

b) [5pt] Parse Tree

$\pi_{\text{name, email}}$ (User $\bowtie$ (PHLogger $\bowtie$ (Member $\div$ π_{iname} $\sigma_{\text{topic = 'alcoholism'}}$ (Interest))))

Execution time: 1 ms

c) [3pts] Result (6 Rows)

PHLogger.name	User.email
'Laree Schamberger'	'laree.schamberger@uci.com'
'Gilbert Nienow'	'gilbert.nienow@uci.com'
'Jamey Brown'	'jamey.brown@uci.com'
'Hans Ratke'	'hans.ratke@uci.com'
'Dustin Schmidt'	'dustin.schmidt@uci.com'
'Katrina Leannon'	'katrina.leannon@uci.com'