April 25\textsuperscript{th}- Relational algebra

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Q1

Consider the following database schema:

Neighbors(name1, name2, duration)
Colleagues(name1, name2, duration)

Write a Relational Algebra Plan for the SQL query below.

SELECT DISTINCT C1.name1, C2.name2
FROM Colleagues C1, Neighbors N, Colleagues C2
WHERE C1.name2 = N.name1
AND N.name2 = C2.name1
AND C1.duration < 10
AND C2.duration < 10
AND N.duration > 100
Q1

Consider the following database schema:

Neighbors(name1,name2,duration)
Colleagues(name1,name2,duration)
Consider the following relational schema:

\[
\begin{align*}
R(A, B) \\
S(C, D, E) \\
T(F, H, G)
\end{align*}
\]

Write a Relational Algebra Plan for the SQL query below.

\[
\begin{align*}
\text{SELECT} & \quad R.B, S.E, \text{sum}(T.G) \\
\text{FROM} & \quad R, S, T \\
\text{WHERE} & \quad R.A = S.C \\
\text{AND} & \quad S.D = T.F \\
\text{AND} & \quad T.H > 55 \\
\text{GROUP BY} & \quad R.B, S.E
\end{align*}
\]
Q3 (1)

Consider the following relational schema:

Users(uid, name)
Comment(uid, pid, score, txt)
Picture(pid, author, img)

(1) Write a Relational Algebra expression that is equivalent to the SQL query below:

SELECT  distinct u.uid  
FROM    Users u, Picture x, Comment y  
WHERE   u.uid = x.author and x.pid = y.pid and y.score > 8  
GROUP BY  u.uid, x.pid  
HAVING   count(*) > 10
Q3 (2)

Consider the following relational schema:

- Users(uid, name)
- Comment(uid, pid, score, txt)
- Picture(pid, author, img)

(2) Write a Relational Algebra expression that is equivalent to the SQL query below:

```sql
SELECT x.pid
FROM picture x
WHERE NOT EXISTS
  (SELECT * 
   FROM comment y
   WHERE x.pid = y.pid and y.score < 5)
```
Q3 (3)

Consider the Relational Algebra expression below: