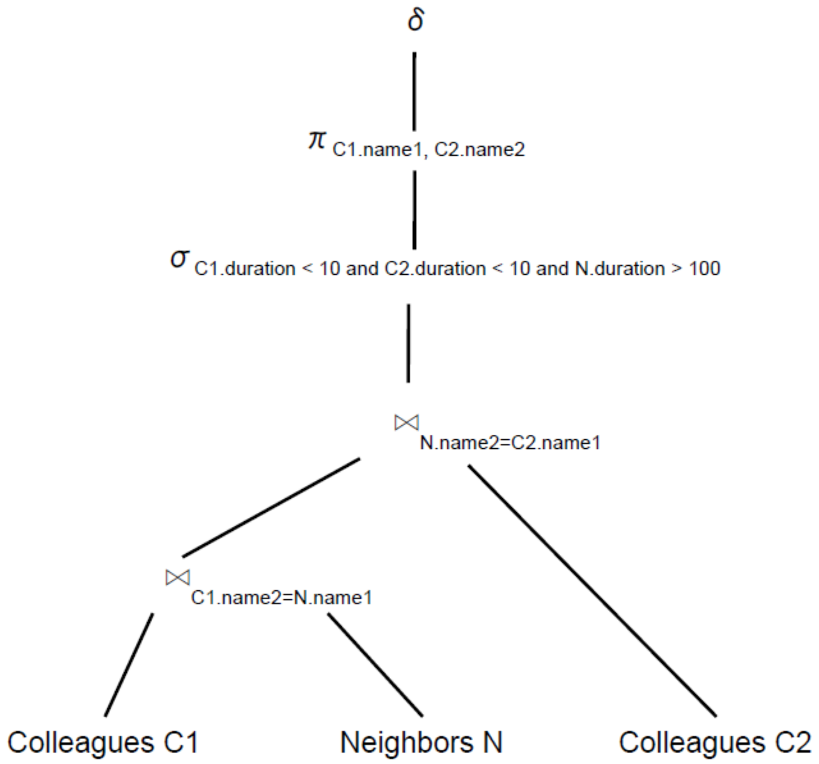
CSE414 section4 worksheet
4/25/2013

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
```

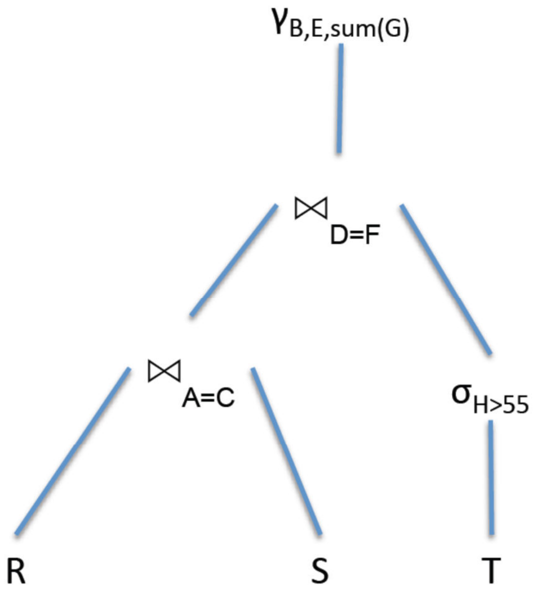


Q2. Consider the following relational schema:

R(A,B)
S(C,D,E)
T(F, H, G)

Write a Relational Algebra Plan for the SQL query below.

```
SELECT R.B, S.E, sum(T.G)
FROM  R, S, T
WHERE  R.A = S.C
AND  S.D = T.F
AND  T.H > 55
GROUP BY R.B, S.E
```



Q3. 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
```

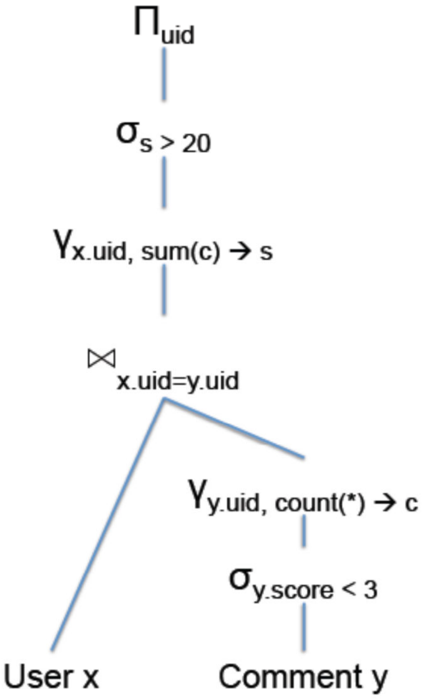
Solution: $\Pi_{u.uid}(\sigma_{cnt>10}(\gamma_{u.uid,count(*)\rightarrow cnt}(\texttt{Users u} \bowtie_{u.uid=x.author} (\texttt{Picture x} \bowtie \sigma_{score>8}(\texttt{Comment y})))))$

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

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

Solution: $\Pi_{pid}(\texttt{Picture}) - \Pi_{pid}(\sigma_{score<5}(\texttt{Comment y}))$

(3) Consider the Relational Algebra expression below:



Write an equivalent SQL query without using any subqueries.

Solution:

```
select x.uid
from Users x, Comment y
where x.uid = y.uid and y.score < 3
group by x.uid
having count(*) > 20
```