

# Section 4 – Solutions

CSE 414

## Question 1

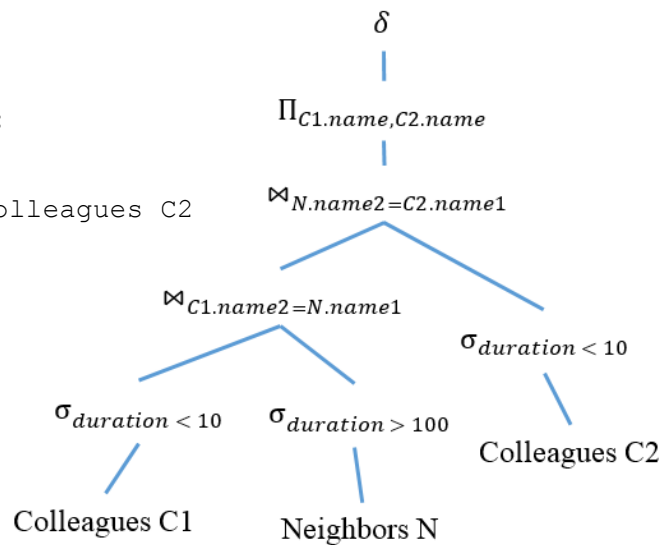
Consider the following database schema:

*Neighbors*(name1, name2, duration)

*Colleagues*(name1, name2, duration)

Write a Relational Algebra Plan for the SQL query:

```
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
```



## Question 2

Consider the following database schema:

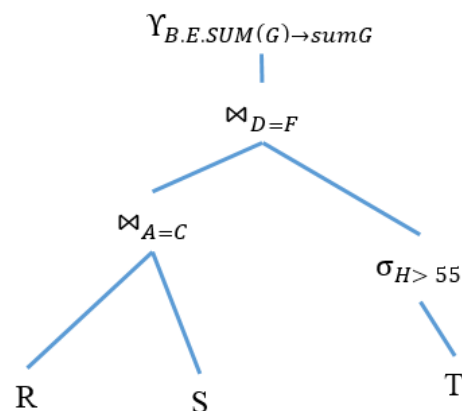
*R*(A, B)

*S*(C, D, E)

*T*(F, H, G)

Write a Relational Algebra Plan for the SQL query:

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



## Question 3

Consider the following database schema:

*Users*(uid, name)

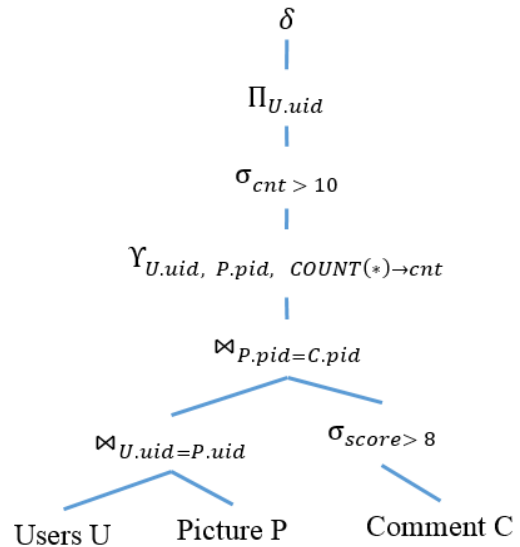
*Comment*(uid, pid, score, txt)

*Picture*(pid, uid, img)

### Part a

Write a Relational Algebra Plan for the SQL query:

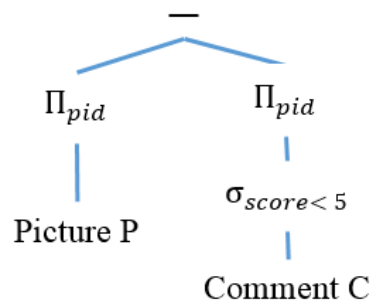
```
SELECT DISTINCT U.uid
FROM Users U, Picture P, Comment C
WHERE U.uid = P.uid
AND P.pid = C.pid
AND C.score > 8
GROUP BY U.uid, P.pid
HAVING COUNT(*) > 10
```



### Part b

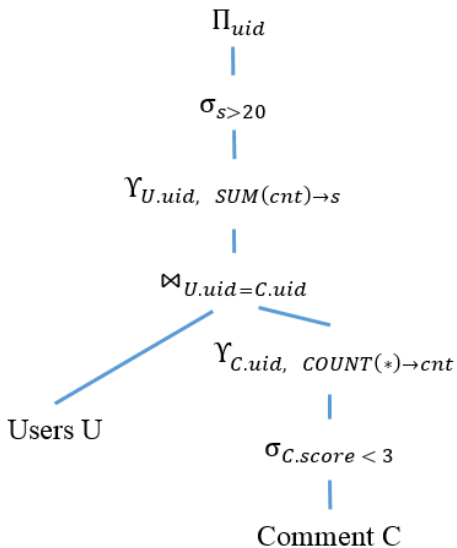
Write a Relational Algebra Plan for the SQL query:

```
SELECT P.pid
FROM Picture P
WHERE NOT EXISTS
  (SELECT *
   FROM Comment C
   WHERE P.pid = C.pid
   AND C.score < 5)
```



### Part c

Write an equivalent SQL query. Bonus: do it without using a subquery!



```
SELECT U.uid
FROM Users U, Comment C
WHERE U.uid = C.uid
AND C.score < 3
GROUP BY U.uid
HAVING COUNT(*) > 20
```