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CSE 414 HW4

**Question 1**

1. δ(δ(R)) = δ(R)  YES
2. ΠL(ΠL(R)) = ΠL(R), where L = a set of attributes  YES
3. ΠK(ΠL(R)) = ΠK,L(R), where K, L = sets of attributes  NO(ΠL(R) only contains L)
4. σC(σC(R)) = σC(R), where C = a condition  YES
5. γL, agg(A)(γL, agg(A)(R)) = γL, agg(A)(R), where L = a set of NO

group-by attributes, agg is an aggregate operator,

and A is an attribute

The first group by L will count A for distinct L, the second group by L will output “1”, because the L is already distinct and only have one row for L.

**Question 2**

a) Πz.word,cnt (γz.wid, z.word, count(\*) -> cnt ((Occurs y ⋈σy.wid=z.wid Word z)⋈ σx.did=y.did Doc x))

b) Πdid, docTitle (Doc x ⋈σx.did !=did  (Keyword u ⋈σu.word !=z.word (Occurs y ⋈σy.wid=z.wid Word z)))

**Question 3**

1) select eid, name from employee

where eid in (select manger.eid from manager

group by manager.eid

having count(mid)>=2)

Πeid, name (employee ⋈ σmanager.eid=employee.eid Πz.word, cnt >=2 (γeid, count(\*) -> cnt (manager)))

2) select eid, name from employee

where eid not in (select manger.eid from manager)

Πeid, name (employee e ⋈ σe.eid !=m.eid manager m)

3) select e.office from employee e

where e.eid in (select m.mid from manager m, employee u

where m.eid = u.eid and u.name = 'Alice')

Πoffice (employee e⋈ σe.eid=m.mid (employee u ⋈ σu.eid=m.eid, u.name=’Alice’ manager m))