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CSE 414 HW4

Question 1

a. $\delta(\delta(R)) = \delta(R)$ YES

b. $\Pi_L(\Pi_L(R)) = \Pi_L(R)$, where L = a set of attributes   YES

c. $\Pi_K(\Pi_L(R)) = \Pi_{K,L}(R)$, where K, L = sets of attributes   NO($\Pi_L(R)$ only contains L)

d. $\sigma_C(\sigma_C(R)) = \sigma_C(R)$, where C = a condition   YES

e. $\gamma_{L,\ agg(A)}(\gamma_{L,\ agg(A)}(R)) = \gamma_{L,\ agg(A)}(R)$, 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) $\Pi_{z.word,cnt}$ ($\gamma_{z.wid,\ z.word,\ count(*)\ \text{-> cnt}}$ ((Occurs y $\bowtie \sigma_{y.wid=z.wid}$ Word z)$\bowtie$ $\sigma_{x.did=y.did}$ Doc x))

b) $\Pi_{did,\ docTitle}$ (Doc x $\bowtie \sigma_{x.did\ !=did}$ (Keyword u $\bowtie \sigma_{u.word\ !=z.word}$ (Occurs y $\bowtie \sigma_{y.wid=z.wid}$ 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)

   $\Pi_{eid,\ name}$ (employee $\bowtie$ $\sigma_{manager.eid=employee.eid}$ $\Pi_{z.word,\ cnt\ >=2}$ ($\gamma_{eid,\ count(*)\ \text{-> cnt}}$ (manager)))

2)   select eid, name from employee
                where eid not in (select manger.eid from manager)

   $\Pi_{eid,\ name}$ (employee e $\bowtie$ $\sigma_{e.eid\ !=m.eid}$ 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')
   Π_{office} (employee e$\bowtie$ $\sigma_{e.eid=m.mid}$ (employee u $\bowtie$ $\sigma_{u.eid=m.eid,\ u.name='Alice'}$ manager m))