CSE 414 HW4

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1. **Datalog**
   Answer(eid,name) :- Employee(eid,name,office), Manager(eid,mid), Managers(eid,mid2), mid != mid2

   Relational Algebra

   $\pi_{employee.eid,employee.name}(\sigma_{count(*)>2}(\gamma_{manager.mid}(Employee \bowtie_{employee.eid=manager.eid} Managerm)))$

2. **Datalog**
   HasManager(eid,name) :- Employee(eid, name, office), Manager(eid,mid) Answer(eid,name) :- Employee(eid,name), NOT HasManager(eid,name)

   Relational Algebra

   $\pi_{employee.eid,employee.name}(Employee-(\pi_{employee.eid}(Employee \bowtie_{employee.eid=manager.eid} Manager)))$

3. **Datalog**
   aliceManagers(mid) :- Employee(eid, 'Alice', office), Manager(eid,mid) Answer(office) :- Employee(mid, name, office), aliceManagers(mid)

   Relational Algebra

   $\pi_{employee.office}(\sigma_{employee.name='Alice'}(Employee \bowtie Manager))$

4. **Datalog**
   NotSame(mid) :- Employee(eid, name, office), Manager(eid,mid), Employee(eid2,name2,office2), Manager(eid2,mid), office != office2 Answer(mid, name, office) :- Employee(mid,name,office), Manager(eid,mid), NOT NotSame(mid)

   Relational ALgebra

   $\pi_{m.mid}$(Manager AS m - [$\pi_{m.mid}(\sigma_{e.eid!=e2.eid,e.office!=e2.office}$(((Employee AS e $\bowtie_{e.eid=m.eid}$ Manager AS m) $\bowtie_{m.mid=m2.mid}$ Manager AS m2) $\bowtie_{m2.eid=e2.eid}$Employee AS e2))])

5. **Datalog**
   Answer(eid2, name2) :- Employee(eid,name,office), Manager(eid,mid), Manager(eid2, eid), Employee(eid2, name2, office2)

   Relational Algebra

   $\pi_{m1.mid=e2.name}(\sigma_{m2.mid!=m1.mid}$(((Manager AS m1 $\bowtie_{e.eid=m1.eid}$Employee AS e) $\bowtie_{m1.eid=m2.mid}$ Manager AS m2) $\bowtie_{m1.mid=e2.eid}$ Employee AS e2))