Assignment 3 Relational Algebra

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1. **List the departments (department name, department number) that have a location in 'San Diego'.**

   $R1 \leftarrow \sigma_{\text{DLOCATION}='\text{San Diego}'}(\text{DEPT\_LOCATIONS})$

   $R2 \leftarrow \text{DEPARTMENT} \bowtie R1$

   $\pi_{\text{DNAME,DNUMBER}}(R2)$

2. **List the names of employees (lname, fname) who have a dependent with the same first name as themselves. (Dependent_name is the first name of the dependent)**

$R1 \leftarrow EMPLOYEE \bowtie_{\text{SSN=ESSN AND FNAME=DPENDENT\_NAME}} DEPENDENT$

$\pi_{\text{LNAME,FNAME}}(R1)$

3. **Retrieve the names of employees (lname, fname) in department 15 who work more than 11 hours per week on the 'SacCT' project. ("SacCT" is the project name.)**

   $R1 \leftarrow \sigma_{DNUM=15\ AND\ PNAME='SacCT'}(Project)$

   $R2 \leftarrow WORKS\_ON \bowtie_{PNO=PNUMBER} R1$

   $R3 \leftarrow EMPLOYEES \bowtie_{SSN=ESSN} (\sigma_{HOURS>11}(R2))$

   $\pi_{\text{LNAME,FNAME}}(R3)$

4. **Find the names of employees (last name, first name) that are directly supervised by 'Anna Hunter'.**

   $R1 \leftarrow \pi_{SSN}(\sigma_{FNAME='Anna'\ AND\ LNAME='Hunter'}(EMPLOYEE))$

   $R2 \leftarrow \rho_{EMP}(R1)$

   $\pi_{LNAME,FNAME}(R2 \bowtie_{SSN=SUPERSSN} EMPLOYEE)$