Database I — Homework # 1

Chuong Vu
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2.1 The appropriate primary keys is underlined

employee (person_name, street, city)

works (person_name, company_name, salary)

company (company_name, city)

2.2

- Inserting a tuple (33333, Peter, Chemistry, 90,000) into the instructor table can cause the violate the foreign key constrant because the department table doesn't contain the Chemistry values
- Delete the tuple from department table (Comp Sci, Taylor, 100000) can cause the violate the foreign key constrant because at least one student or instructor tuple has dept_name as Comp. Sci.

6.1 a) $\Pi_{title}(\sigma_{dept\_name = 'Comp.Sci' \wedge Credit = 3}(course))$

b) $temp \leftarrow (teaches \bowtie instructor)$

$\Pi_{takes.ID}(\sigma_{temp.name = 'Einstein'}(takes \bowtie temp))$

d) $instructor \bowtie (\mathcal{G}_{max(salary)} \text{ as } salary(instructor))$

6.2 a) $P_{employee2}(employee)$

$temp \leftarrow employee \bowtie manages$

$(\Pi_{person\_name}(temp \bowtie_{(manage\_name = employee2.manger\_name \wedge employee.street = employee2.street \wedge employee.city = employee2.city)} (employee2$

b) $\Pi_{person\_name}(\sigma_{company\_name \neq \text{"First Bank Corporation"}}(works))$

c) $Temp \leftarrow \Pi_{works.person\_name}(works \bowtie_{(work.salary \leq work2.salary \wedge work2.company\_name = \text{"Small Bank Corporation"})} \rho_{work2}(works))$

$\Pi_{person\_name}(works) - Temp$

✓

6.10 a) $\Pi_{name}(\sigma_{course.depname = \text{'Comp. Sci'}}(takes \bowtie course \bowtie student))$

b) $\Pi_{ID, name}(student \bowtie takes) - (\Pi_{ID, name}(\sigma_{year < 2009}(student \bowtie takes)))$

Some students may not choose any ~~class~~ courses

6.11 a) $\Pi_{person\_name}(\sigma_{company\_name = \text{"First Bank Corporation"}}(works))$

b) $\Pi_{person\_name, city}(\sigma_{company\_name = \text{"First Bank Corporation"}}(works \bowtie company))$

c) $\Pi_{person\_name, street, city}(\sigma_{company\_name = \text{"First Bank Corporation"} \wedge salary > 10,000}(employee \bowtie works))$

d) $\Pi_{person\_name}(\sigma_{company.city = employee.city}(employee \bowtie company))$

✓ 2/2