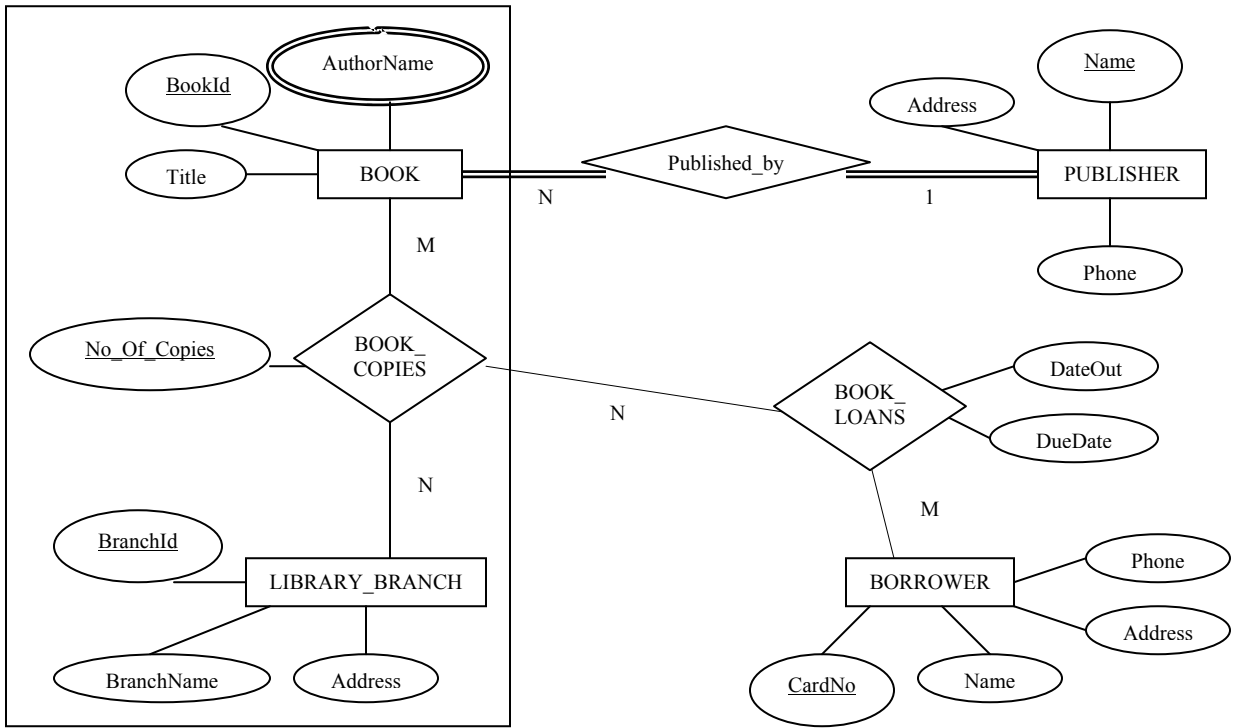
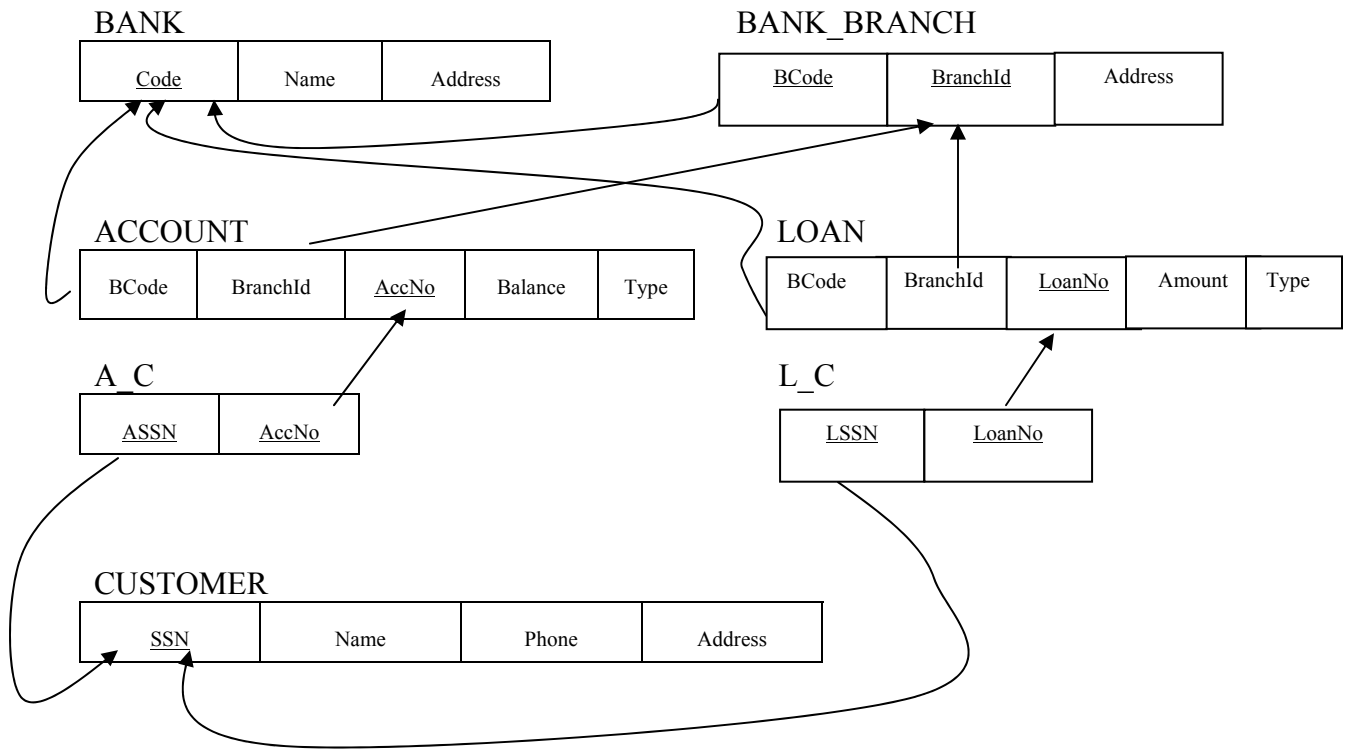


Solutions; HW 3; Spring 2003

9.11



9.13



Relational algebra Queries:

7.18 a)

$$\begin{aligned}t1(ssn, pno) &= \pi_{essn, pno}(\sigma_{hours > 10}(works_on))(ssn, pno) \\t2(pno) &= \pi_{pnumber}(\sigma_{pname = "PRODUCTX"}(project))(pno) \\result(fname, lname) &= \pi_{fname, lname}(employee \bowtie t1 \bowtie t2)\end{aligned}$$

7.18 b) $\pi_{fname, lname}(employee \bowtie \pi_{essn, dependent_name}(dependent))(ssn, fname)$

7.18 c) $\pi_{fname, lname}(employee \bowtie \pi_{ssn}(\sigma_{fname = "Franklin" \text{ and } lname = "Wong"}(employee))(superssn))$

7.18 e) $\pi_{fname, lname}(employee \bowtie (\pi_{essn, pno}(works_on)(ssn, pno) \div \pi_{pnumber}(project)(pno)))$

7.18 f) $\pi_{fname, lname}(employee \bowtie (\pi_{ssn}(employee) - \pi_{essn}(works_on)(ssn)))$

7.18 i)

$$\begin{aligned}t1(ssn) &= \pi_{essn}(works_on \bowtie \pi_{pnumber}(\sigma_{plocation = "Houston"}(project))(pno))(ssn) \\t2(ssn) &= \pi_{ssn, dno}(employee) \bowtie (\pi_{dnumber}(department) - \\&\quad \pi_{dnumber}(\sigma_{dlocation = "Houston"}(department)))(dno) \\result(fname, lname) &= \pi_{fname, lname}(employee \bowtie (t1 \cap t2))\end{aligned}$$

7.18 j) $\pi_{fname, lname}(employee \bowtie (\pi_{mgrssn}(department)(ssn) - \pi_{essn}(dependent)(ssn)))$