

## Homework 2

**Due Wednesday 14 April 2010 7:00 pm**  
**Hard copy due Thursday 15 April in class**

1. Exercise 5.15 page 169 of the text. (Foreign Keys)
2. Exercise 6.17 page 214 of the text. (Relational Algebra)
3. The divide operator  $\div$  is not a primitive operator in the relational algebra.  
Express  $p \div q$  in terms of the complete set of relational operators  $\{ \sigma, \pi, \cup, -, \times \}$ .
4. Assume the following relations (the foreign key constraint is not enforced):

customer

number	name	rating	salesperson
1	smith	5	101
2	jones	7	101
3	wei	10	103

salesperson

number	name	office
101	johnson	23
102	miller	26

- a. Compute customer  $\text{LOJ}_{\text{salesperson=number}} \text{salesperson}$   
where LOJ is the left outer join operator
- b. Compute customer  $\text{ROJ}_{\text{salesperson=number}} \text{salesperson}$   
where ROJ is the right outer join operator
- c. Compute customer  $\text{FOJ}_{\text{salesperson=number}} \text{salesperson}$   
where FOJ is the full outer join operator