1. Review the following terms.
   Relation
   Relation schema
   Relation instance
   Tuple
   Attribute
   Domain
   Superkey
   Candidate key
   Primary key
   Foreign key

2. Review the following relational-algebra operations.
   Select σ
   Project Π
   Cartesian product ×
   Join ⋈
   Union ∪
   Set difference −
   Set intersection ∩
   rename ρ

3. Consider the employee database. What are the appropriate primary keys?

   Employee (eID, person_name, street, city)
   Works (eID, company_name, salary)
   Company (company_name, city)

4. In the instance of *instructor* (Page 5 of the slides), no two instructors have the same name. From this, can we conclude that name can be used as a superkey (or primary key) of *instructor*?

5. Consider the *course* relation: *course(course_id, title, dept_name, credits),* assume {*course_id*} and {*title, dept_name*} can uniquely identify a tuple in the relation. Which of the followings are the superkeys, and which are the candidate keys?

   a. {*course_id*}
   b. {*title*}
   c. {*dept_name*}
   d. {*credits*}
   e. {*course_id, title*}
   f. {*course_id, dept_name*}
   g. {*course_id, credits*}
   h. {*course_id, title, dept_name*}
   i. {*title, dept_name*}
   j. {*title, credits*}
   k. {*dept_name, credits*}
   l. {*title, dept_name, credits*}
   m. {*course_id, title, dept_name, credits*}

6. Consider the employee database of Exercise 3. Give an expression in the relational algebra to express each of the following queries:

a. Find the name of each employee who lives in city "Miami".
b. Find the name of each employee whose salary is greater than $100000.
c. Find the name of each employee who lives in "Miami" and whose salary is greater than $100000.
d. Find the ID and name of each employee who does not work for "BigBank". (Hint: use set-difference)