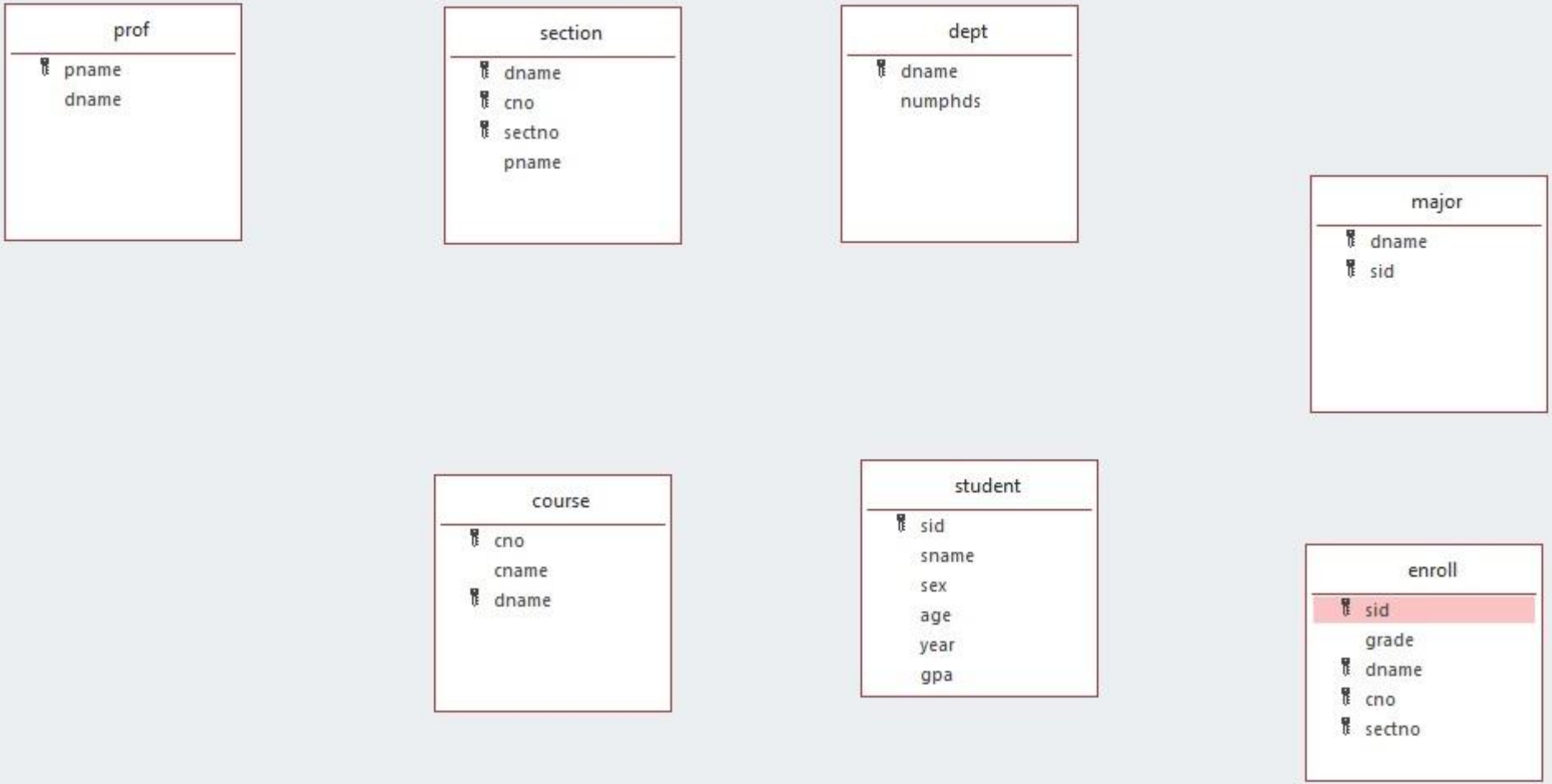
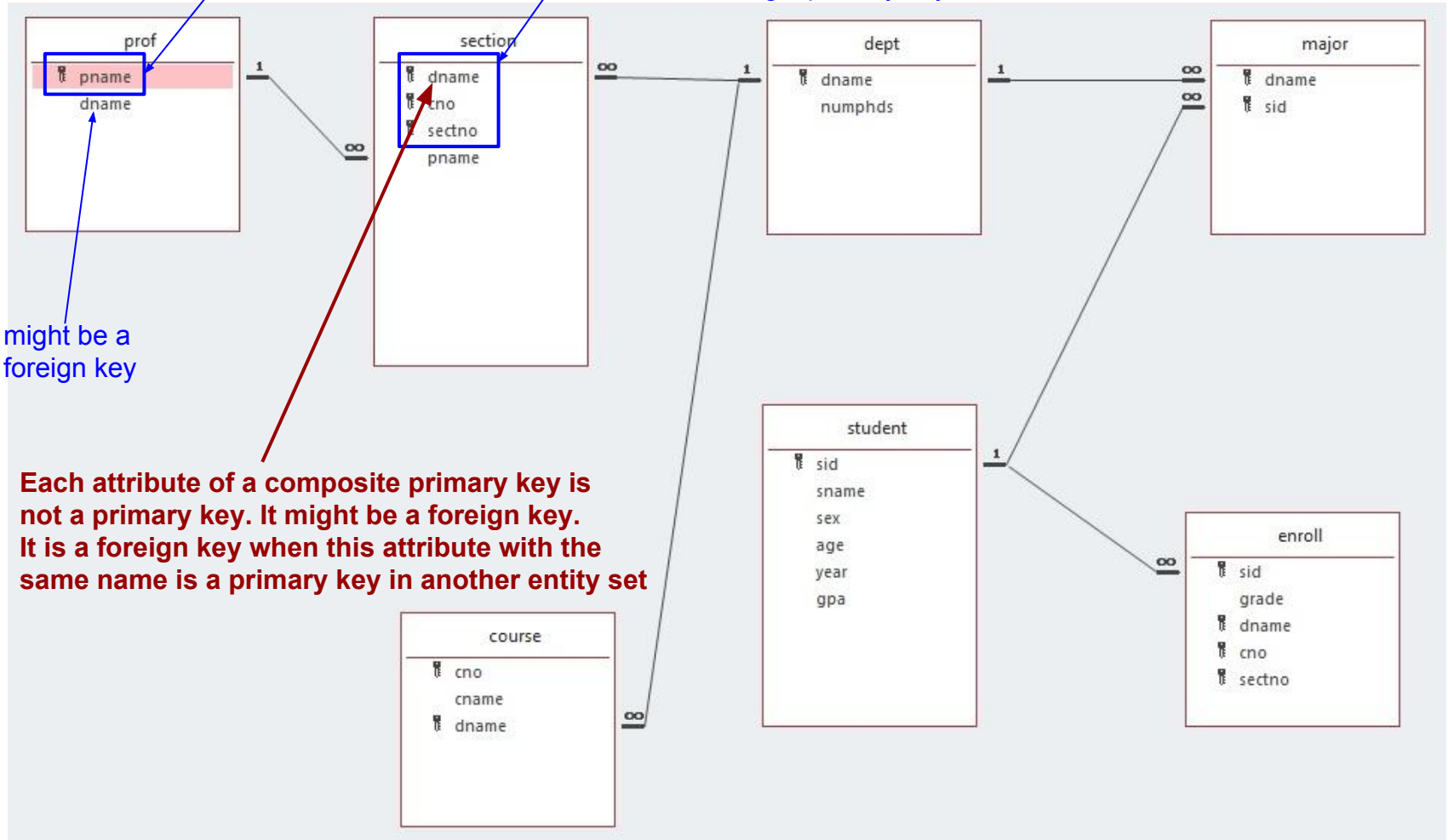
Homework CS336

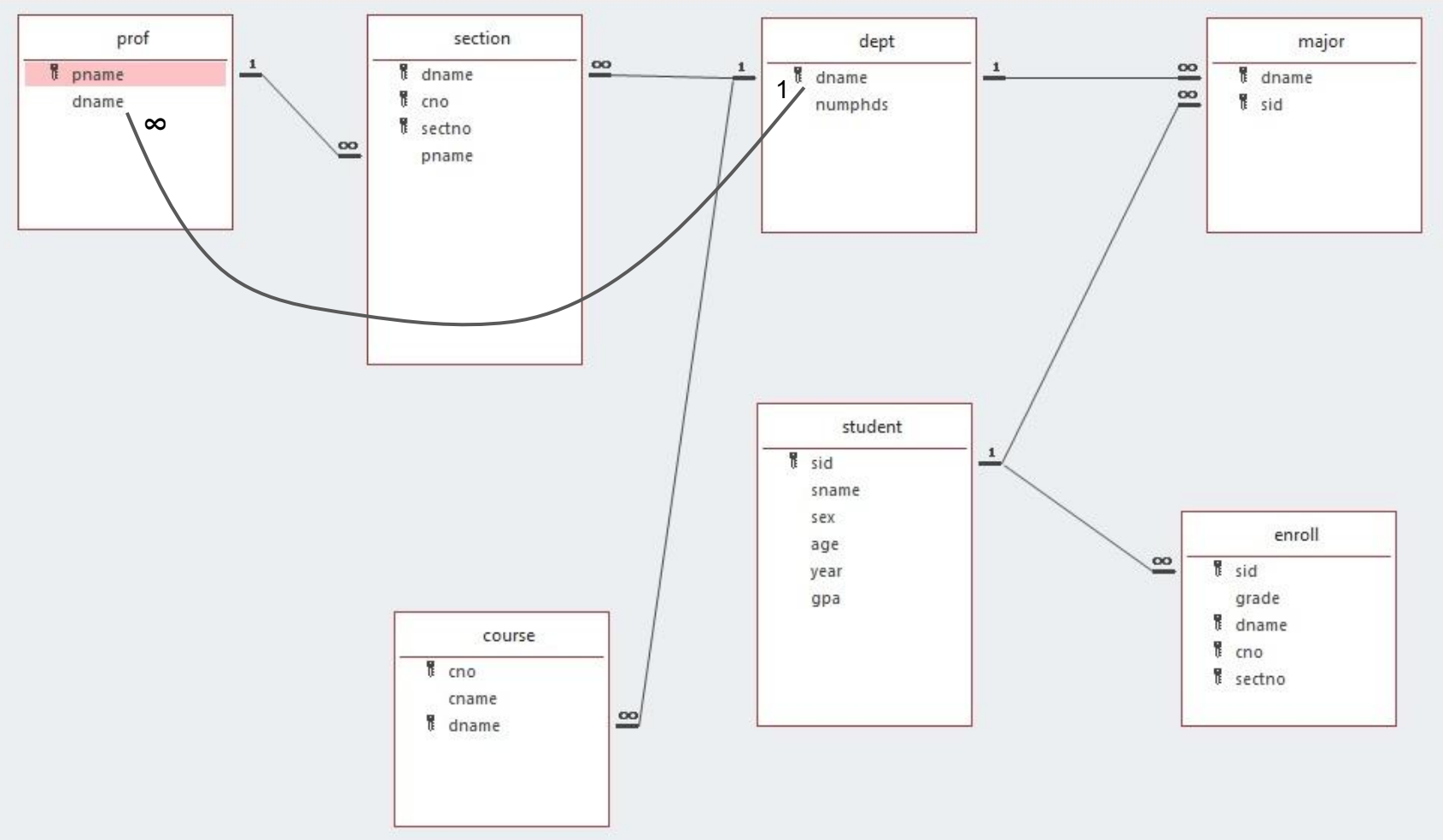
HW1 question: assume there is no weak entity set



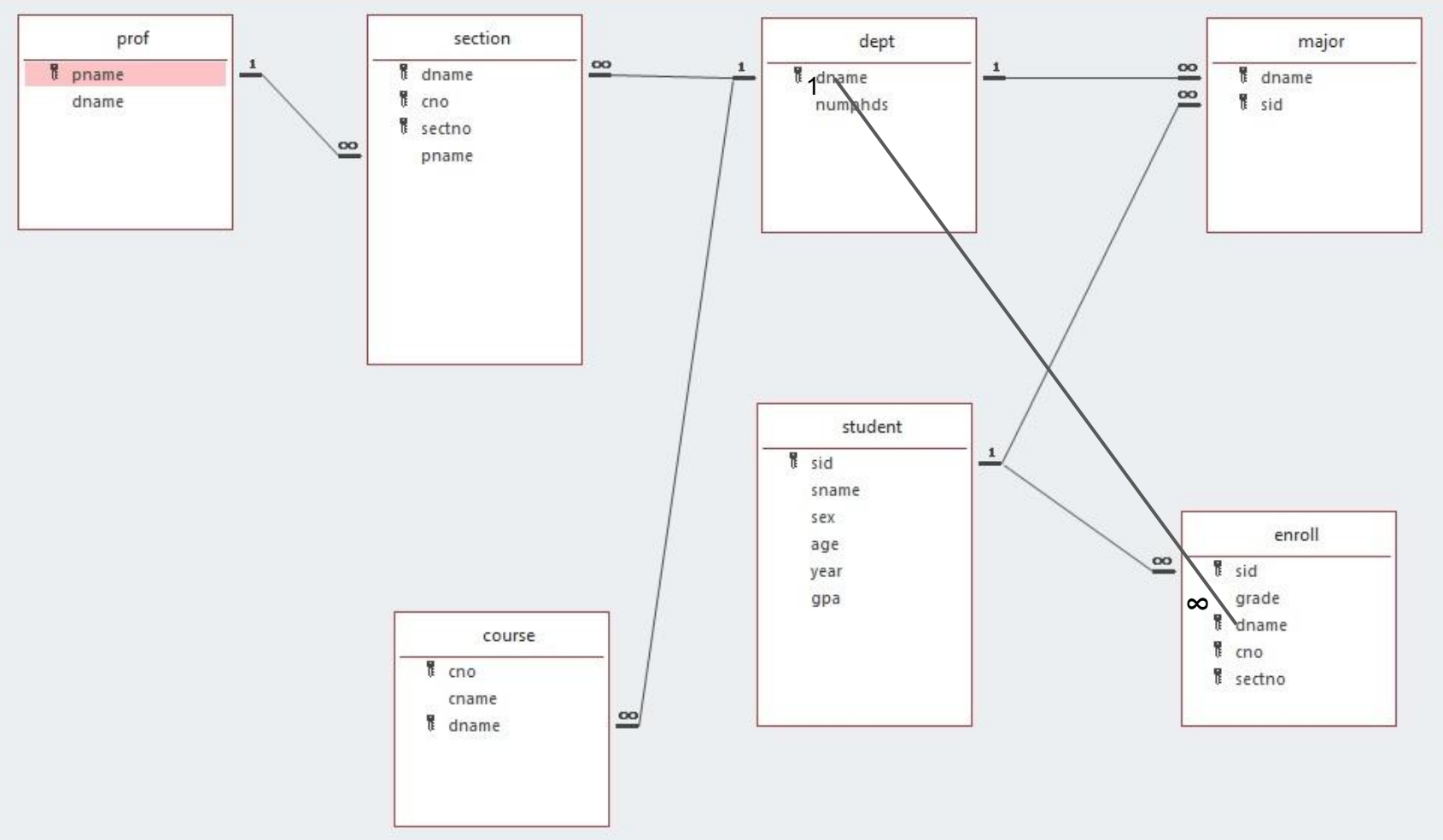
HW1 sol1


primary key of prof
composite primary key of section, treated as a single primary key
might be a foreign key
prof
pname
dname
section
dname
cno
sectno
pname
dept
dname
numphds
major
dname
sid
student
sid
sname
sex
age
year
gpa
enroll
sid
grade
dname
cno
sectno
course
cno
cname
dname
1
∞
Each attribute of a composite primary key is not a primary key. It might be a foreign key. It is a foreign key when this attribute with the same name is a primary key in another entity set

HW1 sol2

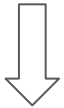

prof
pname
dname
section
dname
cno
sectno
pname
dept
dname
numphds
major
dname
sid
student
sid
sname
sex
age
year
gpa
enroll
sid
grade
dname
cno
sectno
course
cno
cname
dname
1
∞

HW1 sol3


prof
pname
dname
section
dname
cno
sectno
pname
dept
dname
numphds
major
dname
sid
student
sid
sname
sex
age
year
gpa
enroll
sid
grade
dname
cno
sectno
course
cno
cname
dname
1
∞

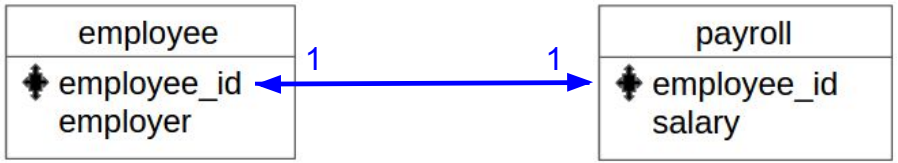
HW1 notes

1. A relationship from a primary key in entity set A to the corresponding foreign key in entity set B is always of type 1-to-many



A value of primary key can only occur once in A, while the same value of foreign key can occur many times in B.

2. There might be 1-to-1 relationship, if both attributes are primary key



HW2 question: Conceptual Modeling using EER Notation

A bank customer may have several savings and checking accounts at a bank, with each account having a current balance; joint accounts are allowed, but must have a primary holder. Assume that only savings accounts earn interest, and that checking accounts are charged a monthly fee.

Customers can also be issued credit cards by the bank, which have the usual information (e.g., card number, expiry date, and limit). (Note that a credit card is not the same as an ATM/debit card, which we will NOT be modeling. It is not tied to an account.)

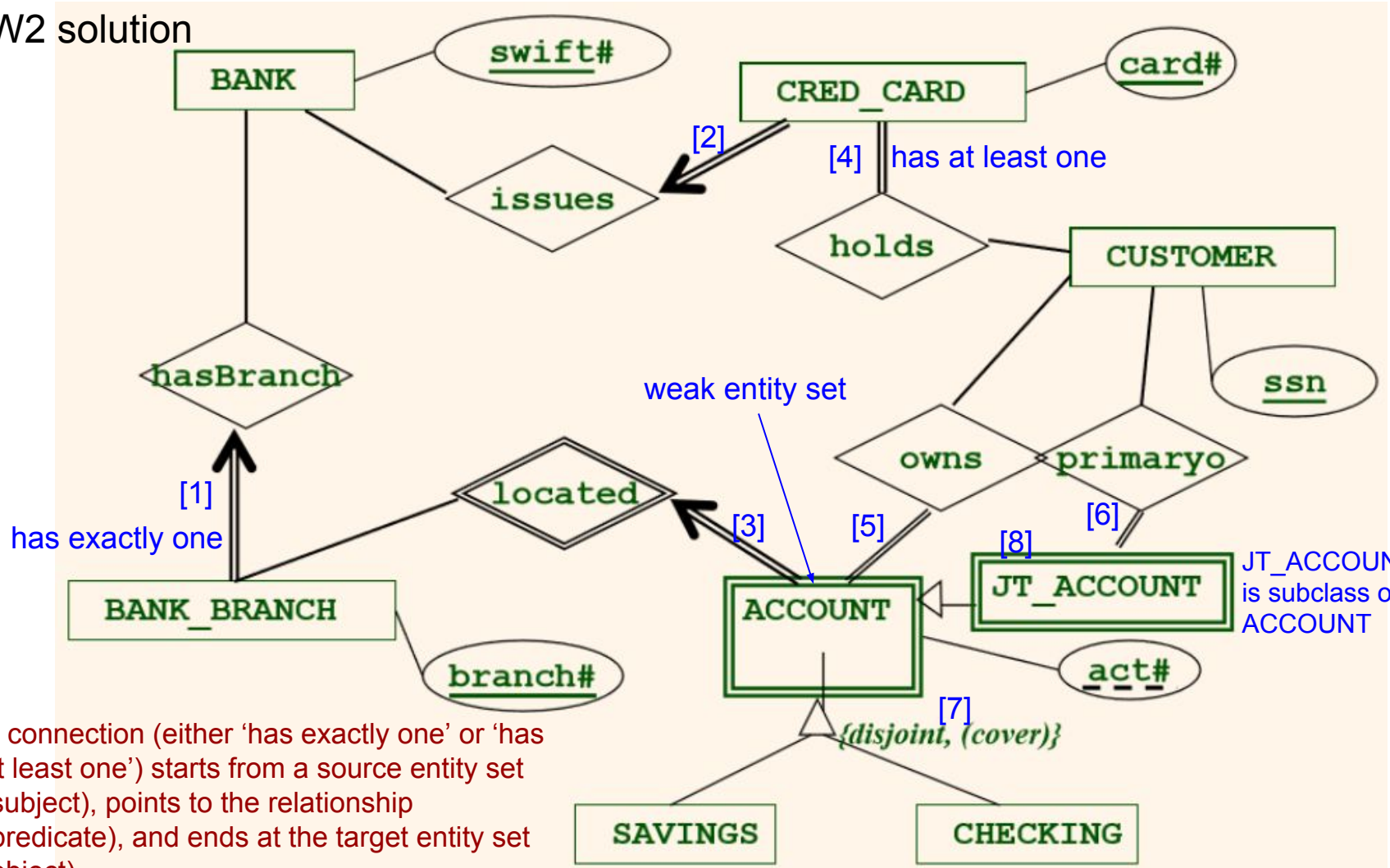
Complication: a bank (with a name, and headquarter state) may have multiple branches (branch information includes unique branch number, address, and phone) and the earlier paragraph failed to make this distinction!

(a) Develop a conceptual model of this domain, and give an EER diagram capturing as much of it as possible. For identification purposes, you can assume that banks (not their branches!) Have a unique SWIFT code (for inter-bank wire transfers), bank accounts have account numbers that are only 5-digits long, and persons have unique social security numbers.

Please use your knowledge of how you interact with banks in creating the diagram. And please be sure to express all possible constraints in the diagram.

(b) Show separately any changes to parts of your EER model if one needed to keep track of the history of balances for each account (from which you can reconstruct deposit/withdrawal information).

HW2 solution



A connection (either ‘has exactly one’ or ‘has at least one’) starts from a source entity set (subject), points to the relationship (predicate), and ends at the target entity set (object)

Notes on HW2 solution

1. A branch has exactly one bank.
2. A credit card is issued by exactly one bank.
3. An account is located at exactly one branch.

4. A credit card is held by at least one customer
5. An account is owned by at least one customer
6. A joint account is primarily owned by at least one customer

7. A tuple of a parent class has to fall into subclasses (cover).
   It can only fall into one subclass (disjoint).

8. No need to draw double borders for subclasses of weak entities