This assignment will be graded out of 100 points.

Due on Thursday, October 18, 2018 by 11:59:59 PM

Submission Guidelines:

- The assignment should be submitted via Blackboard.
- Make sure your name and your student ID are listed in your document.
- Name files as assignment6_<net-id>.<format>
- Accepted document formats are (.pdf, .doc or .docx). If you are using OpenOffice or LibreOffice, make sure to save as .pdf or .doc
- Please do not submit .txt files.
- If there are multiple files in your submission, zip them together as assignment6_<net-id>.zip and submit the .zip file.
- The maximum points one can get in this assignment is 100.
- You may resubmit the assignment at any time. Late submissions will be accepted at a penalty of 10 points per day. Maximum latency is 5 days beyond which a grade of zero will be assigned. This penalty will apply regardless of whether you have other excuses.

Assignment specification:

1) Define the following terms: (**10 pts**.)

- **a.** superclass of a subclass
- **b.** subclass
- **c.** IS-A relationship
- **d.** Specialization
- **e.** Generalization

2) Consider the BANK ER schema in the below Figure, and suppose that it is necessary to keep track of different types of ACCOUNTS (SAVINGS_ACCTS, CHECKING_ACCTS, ...) and LOANS (CAR_LOANS, HOME_LOANS, ...). Suppose that it is also desirable to keep track of each ACCOUNT's TRANSACTIONS (deposits, withdrawals, checks, ...) and each LOAN's PAYMENTS; both of these include the amount, date, and time. Modify the BANK schema, using ER and EER concepts of specialization and generalization.
State any assumptions you make about the additional requirements. (**20 pts.)**

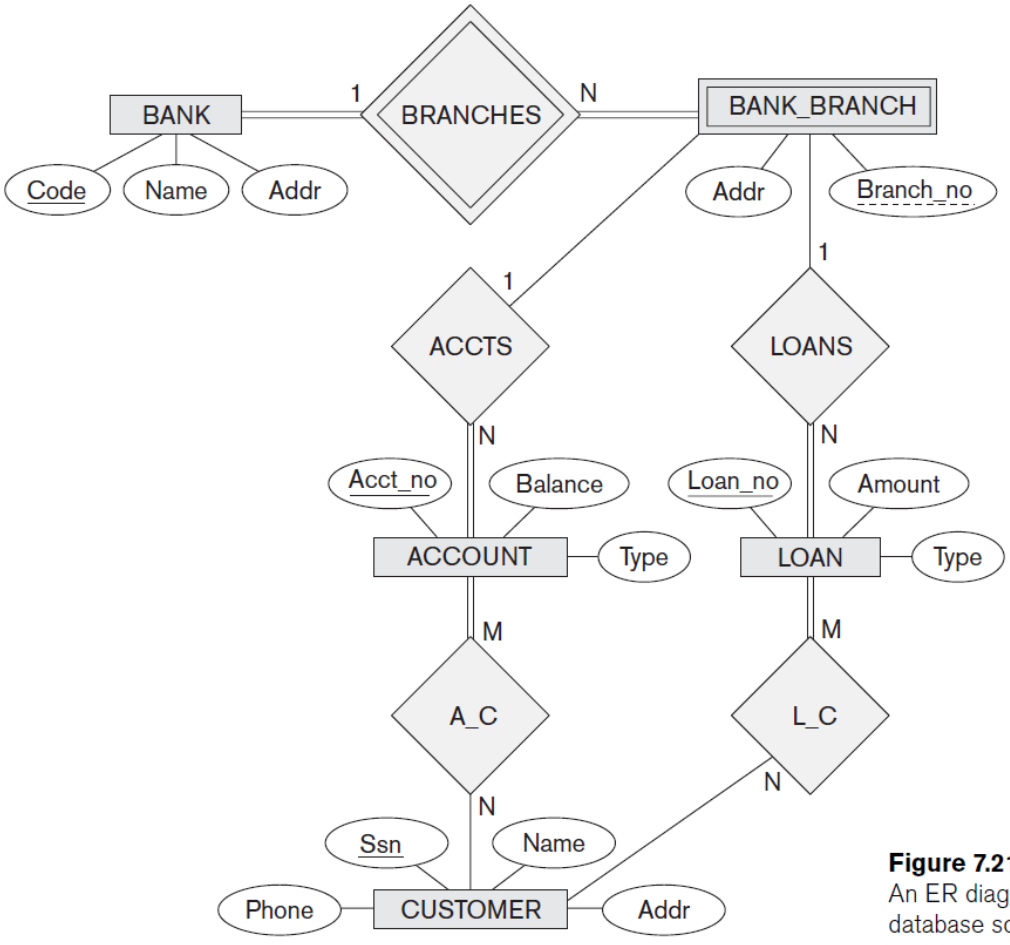

Figure 7.21
An ER diagram for a BANK database schema.

3) Consider the entity sets and attributes shown in the table below. Write your answer in the middle column of each row to indicate the relationship between the left and right columns. (**20 pts.**)

a) The left side has a relationship with the right side
b) The right side is an attribute of the left side
c) The left side is a specialization of the right side
d) The left side is a generalization of the right side

Entity Set	Your Answer	Entity Set or Attribute
1. Mother		Person
2. Daughter		Mother
3. Student		Person
4. Student		Student_id
5. School		Class_room
6. Animal		Horse
7. Employee		ssn
8. Horse		Age
9. Furniture		Chair
10. Chair		Weight

4) Try to map the relational schema in the Figure below into an ER schema. This is part of a process known as reverse engineering, where a conceptual schema is created for an existing implemented database. State any assumptions you make. (**20 pts.)**

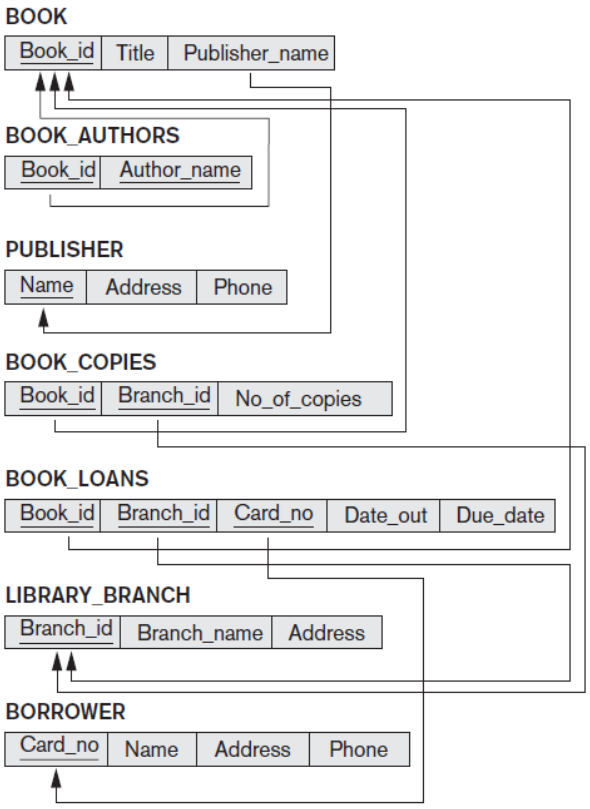

Figure 6.14
A relational database schema for a LIBRARY database.

5) Figure below shows an ER schema for a database that can be used to keep track of transport ships and their locations for maritime authorities. Map this schema into a relational schema and specify all primary keys and foreign keys. (**20 pts**.)

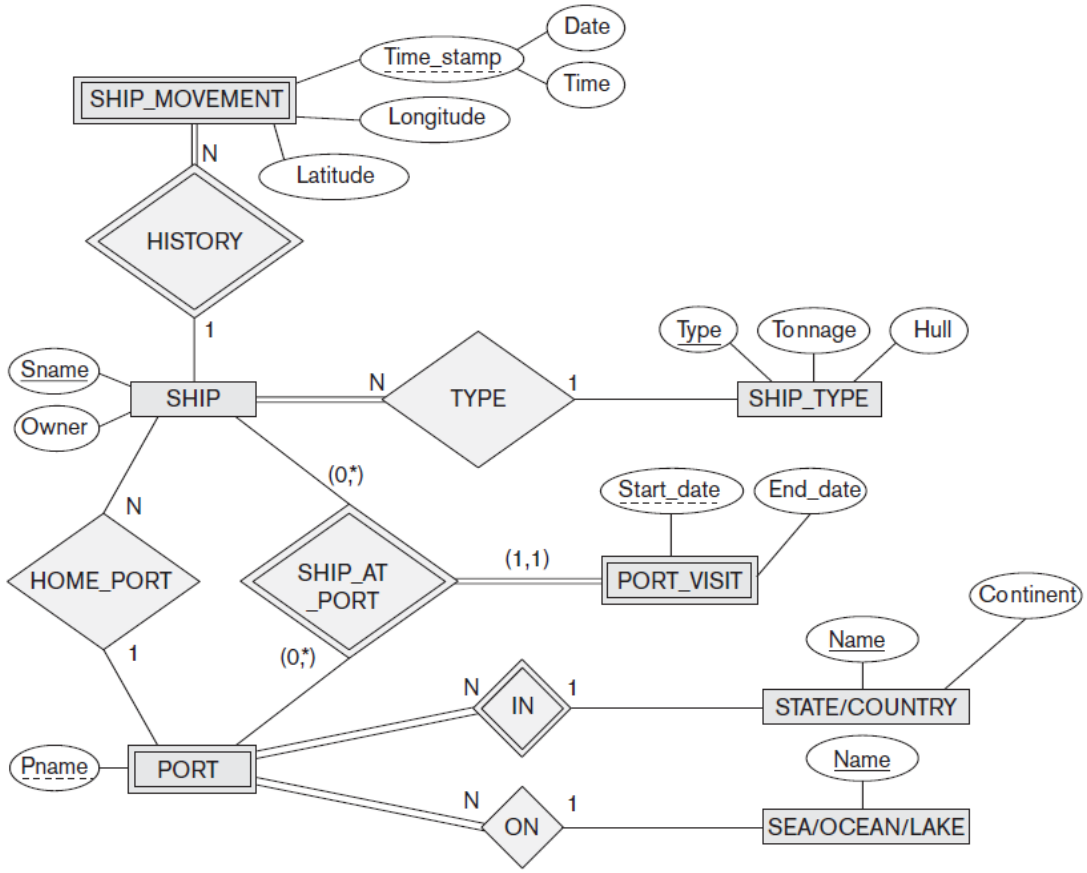

Figure 9.8
An ER schema for a SHIP_TRACKING database.

6) Is it possible to successfully map a binary M:N relationship type without requiring a new relation. If yes, depict it from the below diagram. (**10 pts.**)