Homework 2

Due date: Monday, May 4

Problem 1 *Exercise 4.5.4.a, (A First Course, 3d Ed., p. 164.)*

Problem 2 *Exercise 4.5.2.a, (A First Course, 3d Ed., p. 163-164.)*

Problem 3 *Exersise 4.6.2., (A First Course, 3d Ed., p. 171. 2nd Ed.:)*

Problem 4 *Consider the Entity-Relationship diagram describing the operations of a software company (Figure 1). Let the entity sets in the diagram have the following attributes:*

Projects(<u>Id</u>, CodeName, StartDate, EndDate, Budget);
Developers(<u>SSN</u>,Name, StartDate, Position, Salary);
Languages(<u>Id</u>, Name, Type);
Platforms(<u>Id</u>, Hardware, OS);

1. Convert the E-R diagram into the relational model. Describe all relations, their attributes and keys.

Problem 5

The E-R diagram in Figure represents a simple music industry database. The following a brief descriptions of the entity and relationship sets involved:

- Musicians: name, instrument, country of origin.
- Bands: name, start year, end year, number of albums recorded, country.

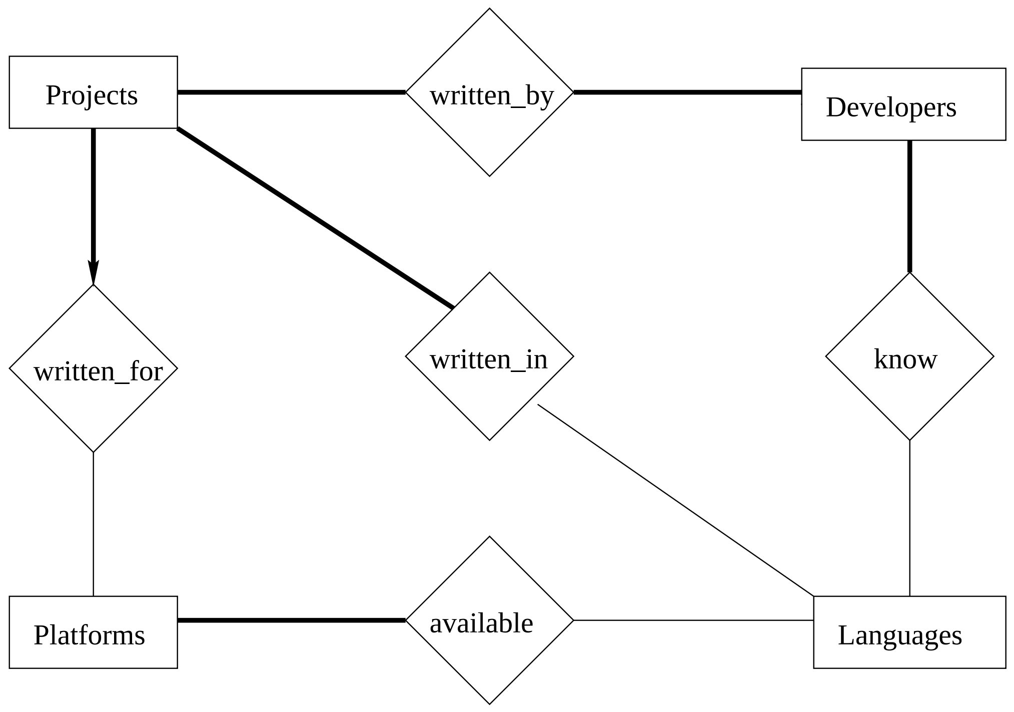

Figure 1: E-R Diagram for Problem 3.

- Album: name, year recorded, number of songs, length.
- RecCompanies: name, country of incorporation, year started.
- Participation of musician in band: year started, year ended.
- Bands recording album: date started, date ended.
- RecCompany releasing album: date of release.
- Contracts: start date, number of years, number of albums.

1. Translate the E-R diagram into relational model. Namely, specify all relations, and their attributes with types.
2. Identify primary keys of all relational tables.
3. Identify all foreign keys present in the database.

Problem 6

The E-R diagram in Figure represents a database of cars and car sales in some city. The brief descriptions of entity sets and relationship sets involved are given below:

- Cars: VIN, make, model, year, color, transmission, milage.

- Dealerships: name, manager, address, phone.
- Salespeople: name, phone.
- Clients: name, address, phone.
- InStock: date, price.
- WorksFor: sarting date, rate[1]
- Sale: date, price, down payment.

1. Translate the E-R diagram into relational model. Namely, specify all relations, and their attributes with types.
2. Identify primary keys of all relational tables.
3. Identify all foreign keys present in the database.

Problem 7

The E-R diagram in Figure represents a database of periodical subscriptions. Its brief description is below:

- Subsecriber: Name.
- Address: street, city, state, zip.
- Periodical: Name. Magazines and Newspapers are two disjoint sets
- Newspaper: city, state, frequency (daily, weekly), circulation.
- Magazine: frequency (# of issues/year), circulation, city of headquaters.
- Publisher: Name, address.
- Subscribes: start date, period (number of years), price.

1. Translate the E-R diagram into relational model. Namely, specify all relations, and their attributes with types.
2. Identify primary keys of all relational tables.
3. Identify all foreign keys present in the database.

[1] Percent of the profit from a car sale that the salesperson earns.

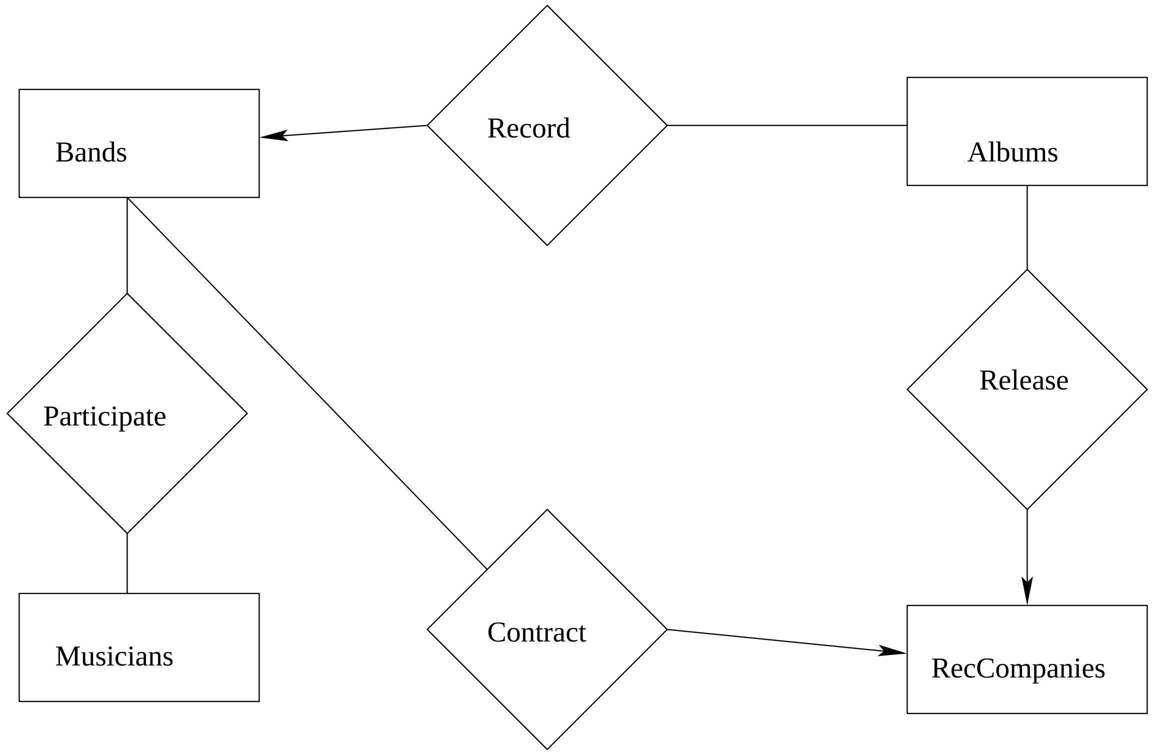

Figure 2: E-R Diagram for Problem 4

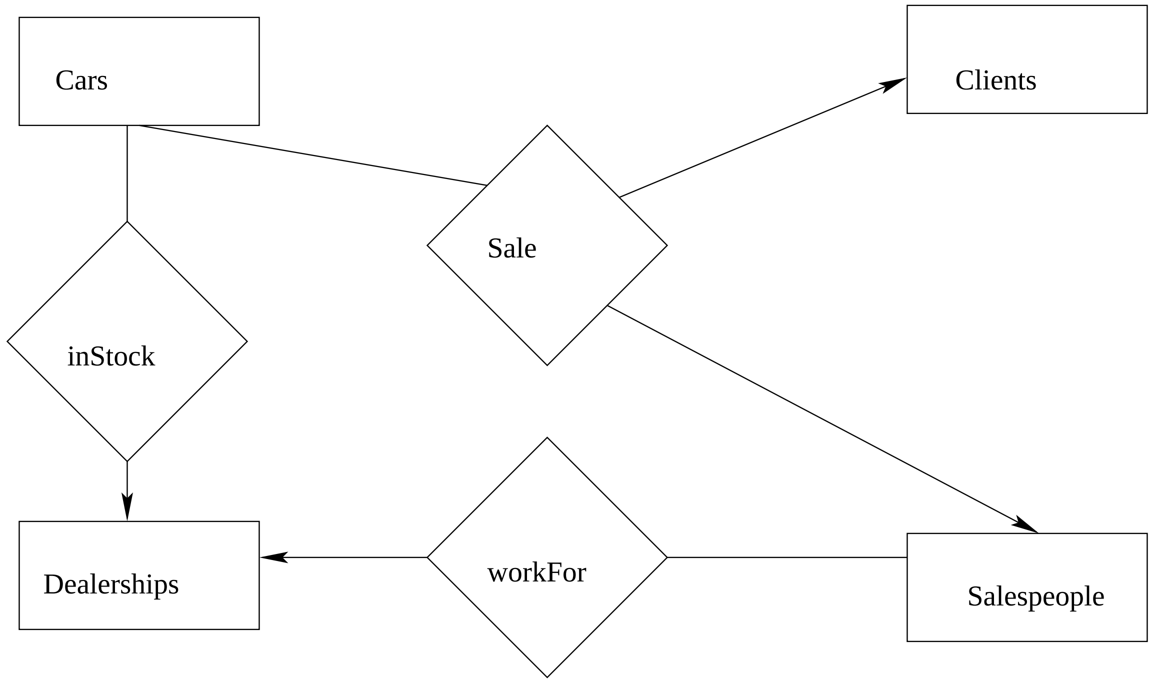

Figure 3: E-R Diagram for Problem 5

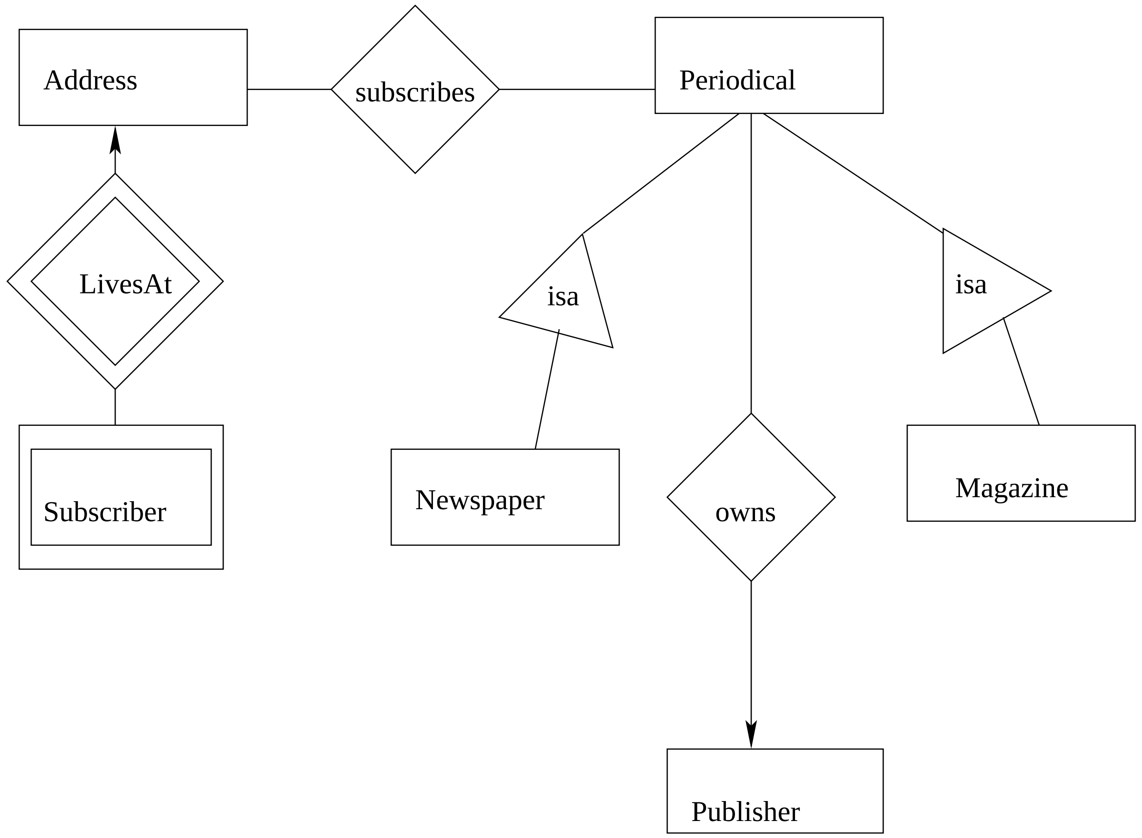

Figure 4: E-R Diagram for Problem 6