Problem 1

Musicana records have decided to store information on musicians who perform on their albums in a database. The company has wisely chosen to hire you as a database designer.

* Each musician that is recorded at **Musicana** has an ID number, a name, an address (street, city) and a phone number.
* Each **instrument** that is used in songs recorded at Musicana has a unique name and a musical key (e.g., C, B-flat, E-flat).
* Each **album** that is recorded at the Musicana label has a title, a and an album identifier.
* Each **song** recorded at Musicana has a unique title and an author.
* Each **musician** may play several **instruments**, and a given instrument may be played by several musicians.
* Each **album** has a number of **songs** on it, but no song may appear on more than one album.
* Each **song** is performed by one or more **musicians**, and a musician may perform a number of songs.
* Each **album** has exactly one **musician** who acts as its producer. A producer may produce several albums.

Design a conceptual schema for Musicana. Be sure to indicate all keys and cardinality constraints and any assumptions that you make.

Problem 2

Prepare an E-R diagram for a real estate firm that lists property for sale. The following describes this organization:

* + The firm has a number of **sales offices** in several states. Attributes of sales office include Office\_Number and Location.
  + Each **sales office** is assigned one or more employees. Attributes of **employee** include Employee\_ID and Employee\_Name. An employee must be assigned to only one sales office.
  + For each **sales office,** there is always one **employee** assigned to manage that office.
  + The firm lists **property** for sale. Attributes of property include Property\_ID and Location. Components Address, City, State, and Zip\_Code.
  + Each **property** must be listed with one (and only one) of the **sales offices**. A sales office may have any number of properties listed, or may have no properties listed.
  + Each **property** has one or more **owners**. Attributes of owners are Owner\_ID and Owner\_Name. An owner may own one or more properties. The system stores the percent owned by each owner in each property.

Problem 3

* The company has a number of employees each **employee** has SSN, Birth Date, Gender and Name which represented as Fname and Lname.
* The company has a set of departments each **department** has a set of attributes DName, DNUM (unique) and locations.
* Employees work in several projects each **project** has Pname, PNumber as an identifier, Location and City.
* Each employee may have a set of **dependent**; each dependent has Dependent Name (unique), Gender, and Birth Date.

Note: if the employee left the company no needs to store his dependents info

* For each Department, there is always one employee assigned to manage that Department and each manager has a hiring Date.
* Department must have employees and employee must work on Only One department
* Each department may have a set of projects and each project must assigned to one department
* Employees work in several projects and each project has several employees and each employee has a number of working hours in each project
* Each employee has a supervisor and supervisor supervise many employee.