Michael Smith

Problem #1:

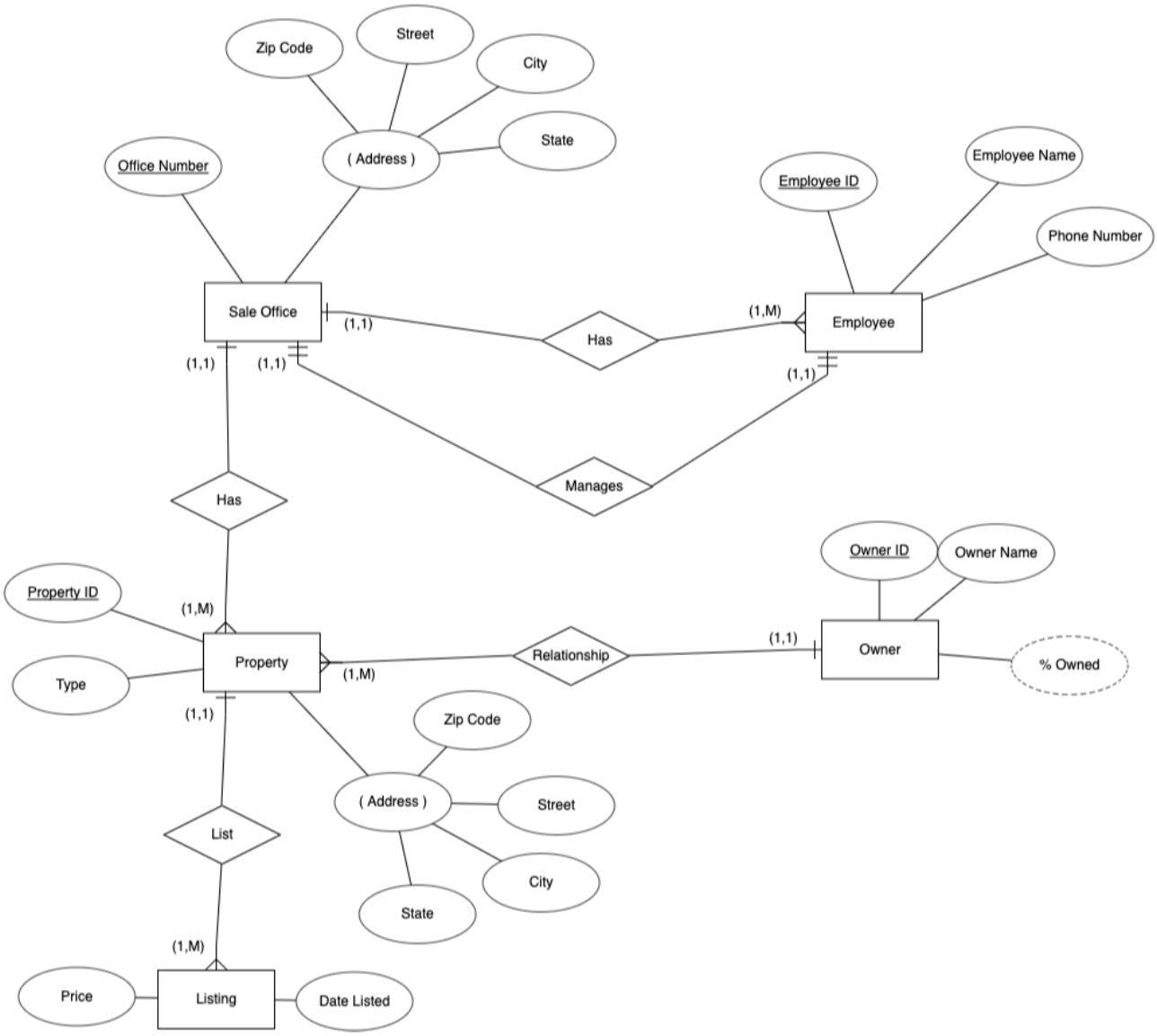
Entities:

- ➔ Sale Office
- ➔ Employee
- ➔ Owner
- ➔ Listing
- ➔ Property

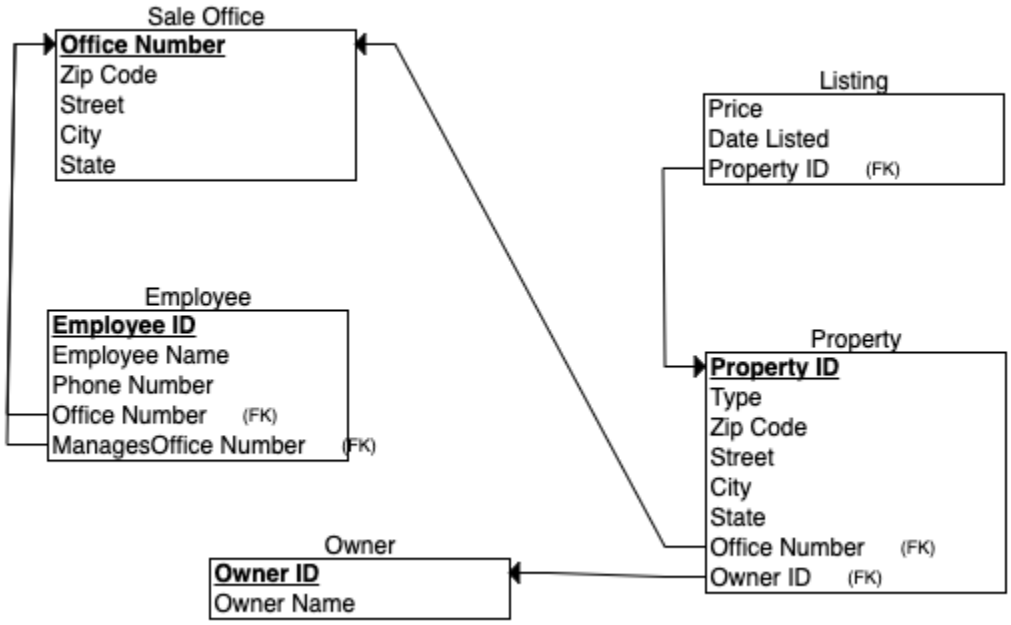
Assumptions:

- ➔ Every Sales Office has at least 1 to many employees, making (1,1) the minimum cardinality and (1,M) the maximum cardinality.
- ➔ There is only one manager for each Sales Office, making (1,1) both the max and min cardinality. The manager is an employing so the Employee ID acts as the managers ID.
- ➔ Every Sales Office has at least 1 to many properties, making (1,1) the minimum cardinality and (1,M) the maximum cardinality.
- ➔ Every Owner owns at least 1 to many properties, making (1,1) the minimum cardinality and (1,M) the maximum cardinality.
- ➔ Every Property has at least 1 to many Listings, making (1,1) the minimum cardinality and (1,M) the maximum cardinality.

ER Diagram:


Zip Code
Street
City
State
(Address)
Office Number
Employee ID
Employee Name
Phone Number
Sale Office
(1,1)
Has
(1,M)
Employee
(1,1)
(1,1)
(1,1)
Manages
Has
Owner ID
Owner Name
Property ID
(1,M)
Property
Relationship
(1,1)
Owner
Type
(1,M)
% Owned
(1,1)
Zip Code
(Address)
Street
List
City
State
(1,M)
Price
Listing
Date Listed

Relational Schema:



Problem #2:

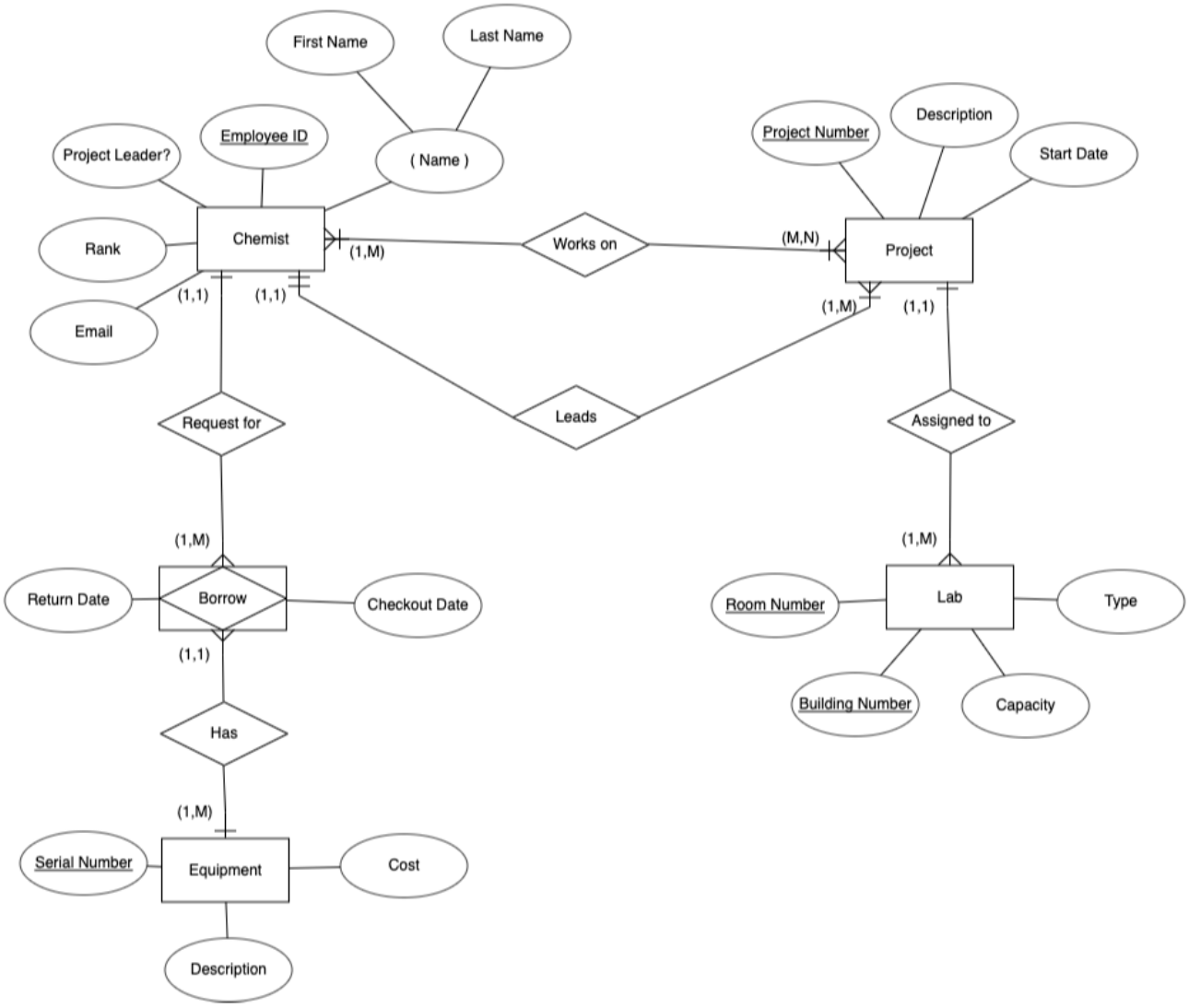
Entities:

- ➔ Chemist
- ➔ Project
- ➔ Lab
- ➔ Borrow
- ➔ Equipment

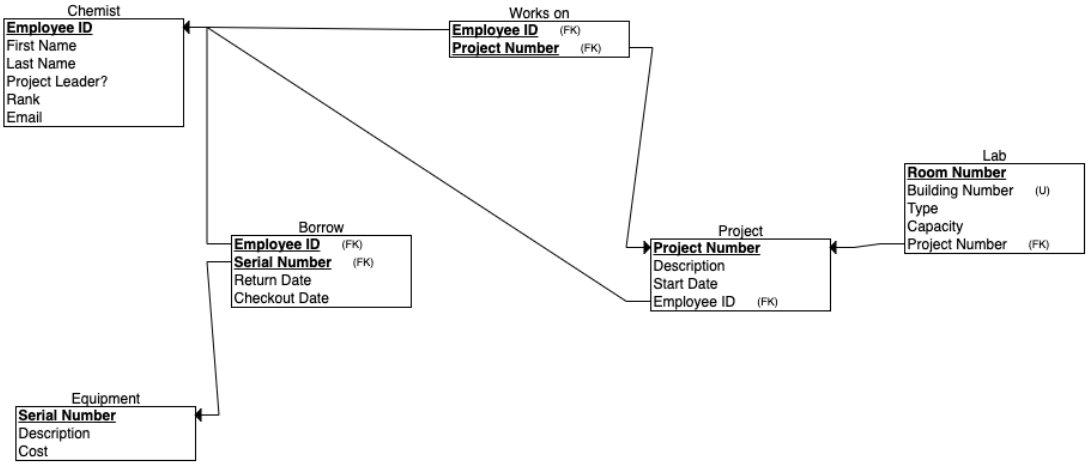
Assumptions:

- ➔ Chemists can work on 1 or many projects at a time, making (1,M) the minimum cardinality and (M,N) the maximum cardinality.
- ➔ Any Chemist can be a project leader for 1 or many projects, making (1,1) the minimum cardinality and (1,N) the maximum cardinality. The Employee ID is the primary key and acts as the foreign key for project leader, hence the question “Project Leader?”.
- ➔ A Project can be assigned to 1 or many Labs, making (1,M) the minimum cardinality and (M,N) the maximum cardinality.
- ➔ A Chemist can Borrow 1 to many equipment, making (1,M) the minimum cardinality and (M,N) the maximum cardinality through an associative entity called Borrow.

ER Diagram:


First Name
Last Name
(Name)
Employee ID
Project Leader?
Chemist
Rank
Email
(1,M)
(1,1)
(1,1)
Works on
(M,N)
Project
Project Number
Description
Start Date
(1,M)
(1,1)
Leads
Request for
Assigned to
(1,M)
(1,M)
Return Date
Borrow
Checkout Date
(1,1)
Has
(1,M)
Serial Number
Equipment
Cost
Description
Room Number
Lab
Type
Building Number
Capacity

Relational Schema:



Problem #3:

- ➔ DBMS makes complicated transactions easier to do compared to an OS file system. I would use this to store Accounting data and company management information. Another type of data that would be better is Airline information and flight records.
- ➔ Operating System files would be better to store API programs and managing directories. OS file systems reduce a lot of redundancies so Language specific libraries and programs would be better suited for it.
- ➔ The advantages of using a DBMS system is that it offers a lot of unique ways to store and retrieve data. It also allows for better data security as well as having a crash recovery mechanism. The disadvantage of a DBMS system is that it is generally more expensive when it comes to the hardware and software. IT also involves a lot more complex systems making it harder to operate.
- ➔ The advantages of OS file is it's cost efficient and can even be more efficient when handling data in specific situations. It also has a much simpler design when compared to DBMS. The disadvantages of it is that there is limited data sharing and can be very time consuming. It is more of security risk as well.