Question 1 (ERD Creation) *(25 points)*

Use the following business rules to create a Crow's Foot ERD. Write all appropriate connectivities and cardinalities in the ERD.

1. A department employs many employees, but each employee is employed by only one department.

2. Some employees, known as "rovers," are not assigned to any department.

3. A division operates many departments, but each department is operated by only one division. An employee may be assigned many projects, and a project may have many employees assigned to it.

4. A project must have at least one employee assigned to it.

5. One of the employees manages each department, and each department is managed by only one employee.

6. One of the employees runs each division, and each division is run by only one employee.

Question 2 (Normalization) *(25 points)*

The dependency diagram in Figure Question 2 indicates that a patient can receive many prescriptions for one or more medicines over time. Based on the dependency diagram, create a database whose tables are in at least 2NF, showing the dependency diagram for each table.

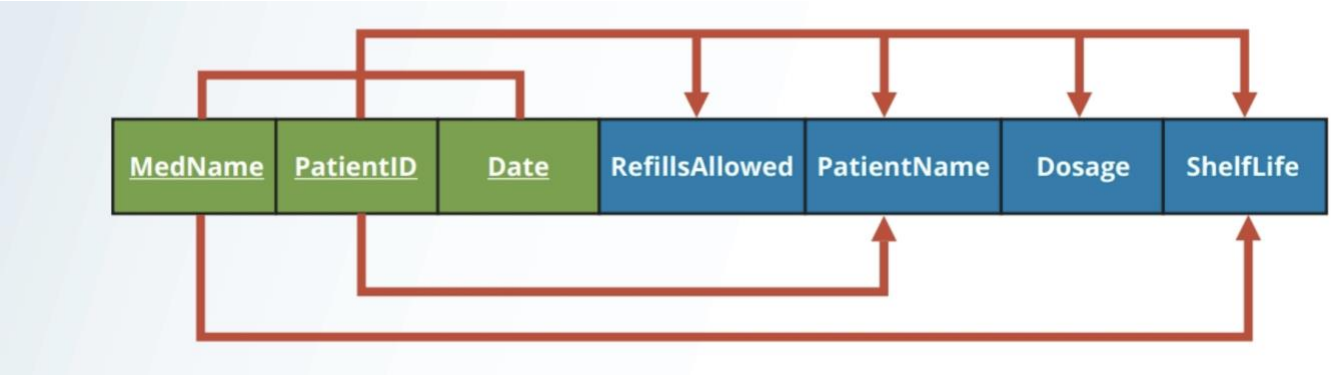

Figure: Question 2

Question 3 (Normalization) ***(25 points)***

To keep track of office furniture, computers, printers, and other office equipment, the FOUNDIT Company uses the table structure shown in Table Question 3.

Attribute Name	Sample Value	Sample Value	Sample Value
ITEM_ID	231134-678	342245-225	254668-449
ITEM_LABEL	HP DeskJet 895Cse	HP Toner	DT Scanner
ROOM_NUMBER	325	325	123
BLDG_CODE	NTC	NTC	CSF
BLDG_NAME	Nottooclear	Nottooclear	Canseefar
BLDG_MANAGER	I. B. Rightonit	I. B. Rightonit	May B. Next

a. Given that information, draw the dependency diagram. Make sure that you label the transitive and/or partial dependencies.

b. Create a set of dependency diagrams that meet 3NF requirements. Rename attributes to meet the naming conventions, and create new entities and attributes as necessary.

c. Draw the Crow's Foot ERD.

Question 4 (Advanced Data Modeling) ***(25 points)***

The FlyRight Aircraft Maintenance (FRAM) division of the FlyRight Company (FRC) performs all maintenance for FRC's aircraft. Produce a data model segment that reflects the following business rules:

1. All mechanics are FRC employees. Not all employees are mechanics.

2. Some mechanics are specialized in engine (EN) maintenance. Others are specialized in airframe (AF) maintenance or avionics (AV) maintenance. (Avionics are the electronic components of an aircraft that are used in communication and navigation.) All mechanics take periodic refresher courses to stay current in their areas of expertise. FRC tracks all courses taken by each mechanic—date, course type, certification (Y/N), and performance.

3. FRC keeps an employment history of all mechanics. The history includes the date hired, date promoted, and date terminated.

Given these requirements, create the Crow's Foot ERD segment.