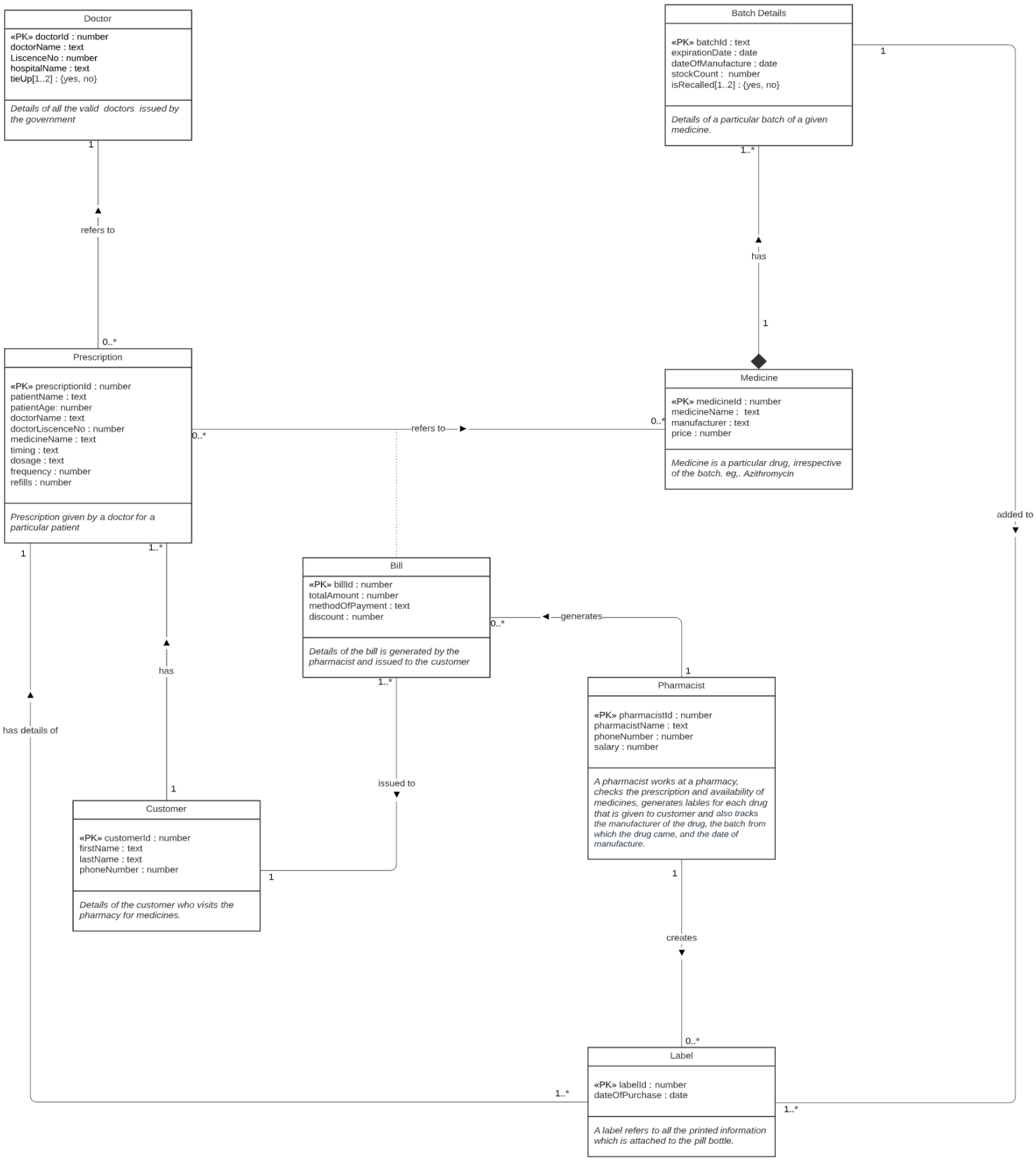
Assignment-1: Build a Conceptual Data Modeling

Pharmacy - UML Class Diagram



Entity Definitions:

- ***Prescription:*** A written document from the doctor that contains the prescription ID (also commonly known as Rx#), the patient and doctor details, the name, quantity, course, dosage and maximum refills of the prescribed drugs.

- ***Pharmacist*:** A person who is professionally qualified to prepare and dispense medicinal drugs.

- ***Customer:*** A customer is a person (here, patient) who visits the pharmacy to purchase medicines and has a valid prescription.

- ***Doctor:*** A person who is institutionally qualified to treat people who are suffering from an illness.

- ***Label:*** The label includes information about the customer, the doctor who prescribes the drug, the drug (e.g., Azithromycin), when to take it, and how often, the dosage of the pill (250 mg), the number of refills, expiration date, and the date of purchase.

- ***Batch Details:*** Drug inventory with all the information about the batch like expiry date, the date of manufacture, stock and recall information.

- ***Medicine:*** Information about a particular drug including the manufacturer details and price.

- ***Bill:*** A printed or written statement of the money owed for goods or services, (here) for medicines. It includes the total amount to be paid, bill ID, method of payment and discounts if any.

Assumptions and notes:

- **Overall Assumption:**

  I have developed the conceptual data model for the classes and relationships ***within the context of pharmacy*** as suggested in the question i.e. the starting point would be the customer visiting the pharmacy along with the prescription or the prescription could be directly accessed by the pharmacist in some manner. Therefore, I have not included classes such as "Diagnosis", "Tests" etc. that do not fall within the context of Pharmacy as it wouldn't make sense to.

  However, I have included the Doctor class which consists of the details of all the licensed doctors issued by the Government as it is important to verify the prescription's validity against it and also to facilitate the provision of discounts on the medicines prescribed by the doctors/ hospitals that the pharmacy has tie-ups with.

  I have also additionally added the Bill class as it is an important aspect in the pharmacy point of view.

  The information about the doctor that is required to be included in the label is available in the prescription class as attributes.

- **Assumptions/notes regarding certain Classes, Relationships and Multiplicities:**

  1) **Customer-Prescription (1 to 1..*):** I have assumed that the pharmacy provides the customer with medicines only if the customer has a valid prescription that belongs to him/her. Hence, every customer has at least one prescription and a given prescription can have only one customer.

  2) **Prescription-Medicine (* to *):** The prescription class is related to the medicine class by the relationship "refers to" in order to be able to map the medicine present in the prescription to its corresponding medicine available at the pharmacy. One prescription can refer to 0 medicines when there is ***no stock*** of that particular medicine in the Pharmacy.

  3) **Medicine-Batch Details (1 to 1..*):** One medicine should have at least one batch and can have many batches. One particular batch consists of only one medicine e.g. AzithromycinZ is a medicine manufactured by a particular manufacturer and it can have several batches like A1, A2 and so on. It is **a *composition relationship*** *as - if there is no medicine, batch cannot exist independently* (on its own). The reasoning behind having two classes - batch details and medicine is to ***avoid redundancy.***

  4) **Bill (Association class):** I have considered this class as an association class (represented by a dotted line) that results from the association of prescription (contains list of medicines) and medicine (contains price of the medicine) from which the bill can be generated by the pharmacist.

  5) **Label Class:** This class gets information or attributes of a particular medicine from the prescription class and the batch details class.

  6) **Batch Details Class:** I have added the attributes - "stockCount" in order to track the availability of the medicine and "isRecalled" to keep a track of whether a particular drug batch has been recalled or not, this attribute can have two values 'yes' or 'no', if yes then it is extremely important that the pharmacist dumps this batch of medicines immediately.

- **In support of my descisions:**

1) When trying to identify attributes and data types for each of the classes, their roles and responsibilities were ensured to be unique. If there were any overlapping attributes, they were related and a relation for the same was established.

2) Regarding the cardinality for each of the relations, it was done alongside associating the verb and noun. That helped in the identification of one to many and many to many relationships between the classes.

3) In the due process, data types for each of the attributes were also thought through. Most of them were identified as text, number or certain custom enumerations.