EXERCISE CASE on Relational Database Design

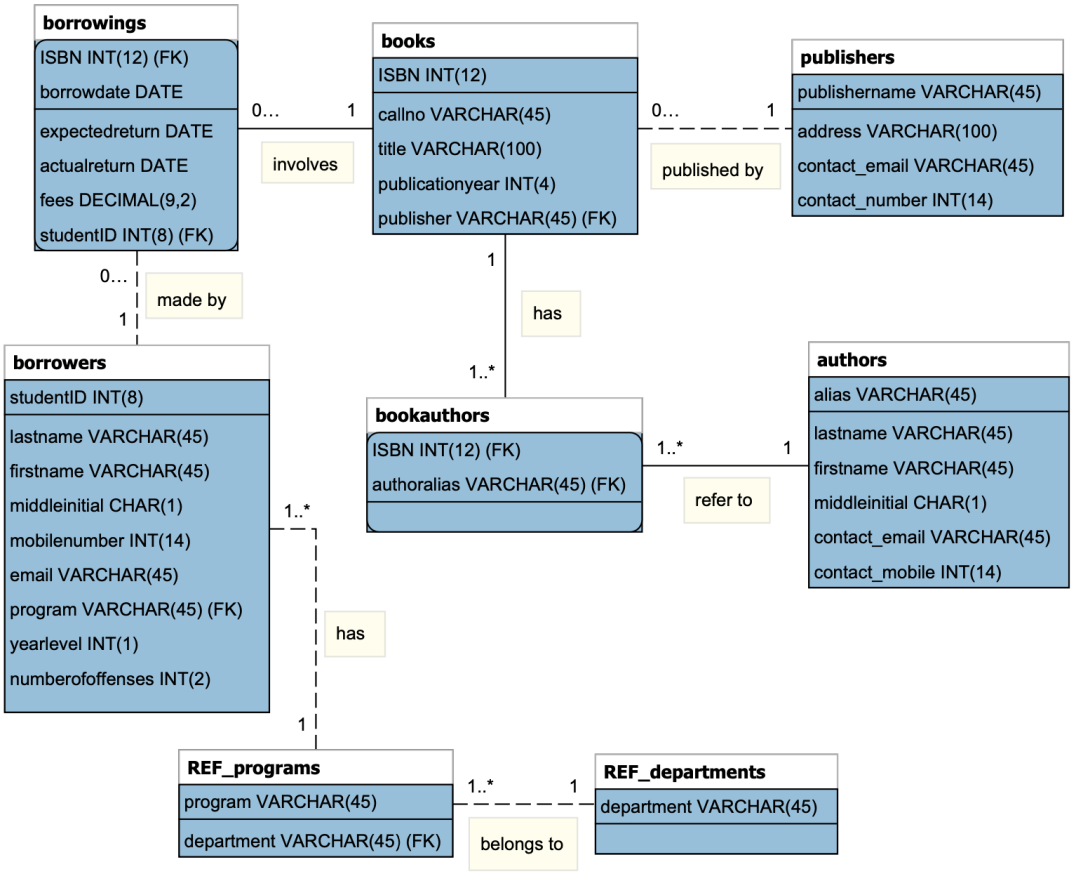
Instructions

- Questions leading to the identification of identifiers, foreign keys, and the creation of tables will not be entertained. It is part of the skill you need to develop.
- Questions to clarify the possible attribute's values are the only questions that will be entertained.
- The design must be 3NF Compliant

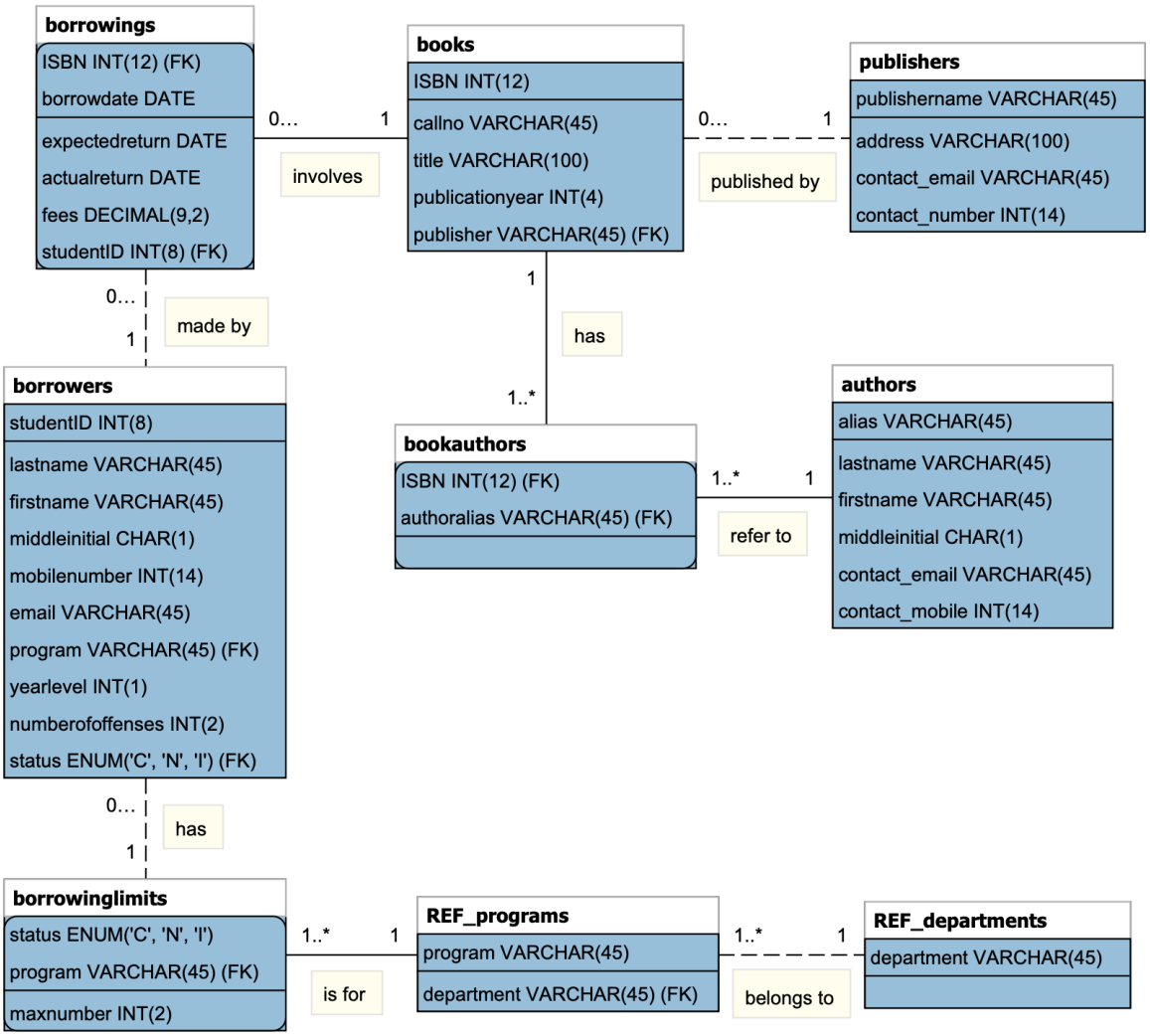
1. **Library System**. A database must be designed and intended for a Library System. Books being managed in the library have a unique ISBN, a unique Library Call No, a title, publication year, a publisher, and a list of authors. Each author has a complete name (last name, middle initial, and first name), a unique author alias, and contact information (email, unique mobile number). Publishers have the publisher's name, the address used for reference, and a contact email and number.

   Since books are being borrowed from the library, it is important to keep track of borrowers. Borrowers have a unique student ID, complete name (last name, middle initial, and first name), unique mobile number, email address, program enrolled in, and department of the program. When borrowers borrow books, the library records the date it was borrowed, the expected to be returned, the actual return date, fees collected for late return, the student that borrowed the book, the year level, and the number of borrowing offenses in the past.

   Functional Dependencies:
   Program → Department of the Program
   Student ID → Complete Name, Mobile Number, Email Address, Program, Department of the Program, Year Level, Number of Borrowing Offenses in the past

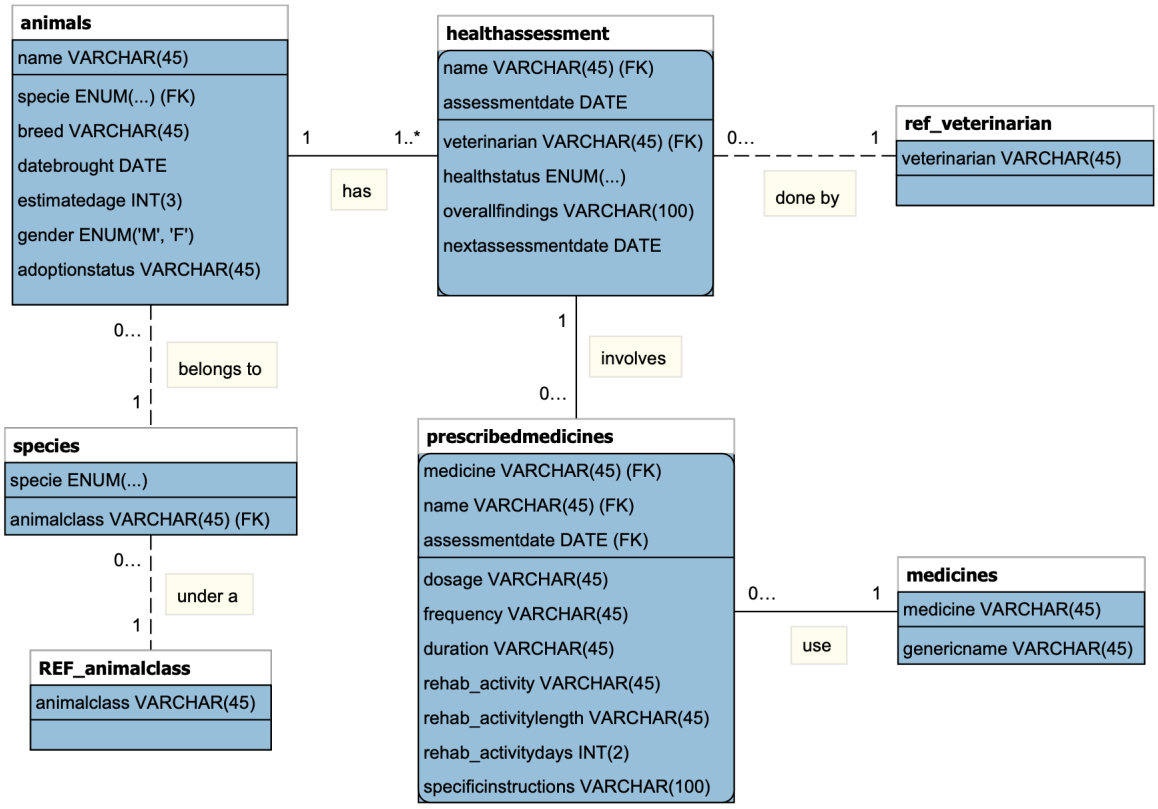


2. **Extended Library System.** After some time in using the Library System, new requirements were collected that necessitated adjustments to the system. Depending on the status (Active-Compliant, Active-Non-Compliant, Inactive) and the program of the borrower, the maximum number of books that can be borrowed must be recorded.



3. **Animal Shelter Management System.** Managing an animal shelter can be a daunting task. An Animal Shelter Management System will be developed to support the organization, and a database must be designed to store its data. Animals in the shelter are tracked using a unique name of the animal; other details are recorded, such as the species (Dog, Cat, Turtle, Guinea Pig), animal class (mammal, amphibian, etc.), the breed, the date it was brought to the center, estimated age when it was brought to the center, gender, and adoption status. For each animal, several health assessment records are kept. These are being used to monitor the condition of the animal. Each animal can only be assessed once for a given day. Each health assessment included the assessment date, the veterinarian that made the assessment, health status (Good Condition, Sick-On Treatment, Sick-Not Treated, Sick-Candidate for Euthanasia), overall health findings, and recommended next health assessment date. It is possible that in an assessment, several medicines have to be prescribed (medicine generic name, medicine name, dosage, frequency, duration), and rehabilitation instructions (activity to perform, how long the activity should be, for how many days the activity must be done, other specific instructions).

Functional Dependencies:
Medicine Name → Medicine Generic Name
Specie → Animal Class



4. **Extended Animal Shelter System.** With the expansion of the shelter to include adoption services, new records that must be managed emerged. This includes the adopter who has a complete name, complete address for reference, the city, province, and zip code residing on, mobile number, and email. An adopter can adopt several animals that are for adoption, as pets from the shelter. For each adoption, the date of adoption is recorded, the animal adopted, the status of the adoption (Reserved, Adopted-Temporary, Returned, Adopted-Permanent), and the veterinarian that facilitated the adoption.

   Functional Dependencies:eovreh
   Zip Code → City, Province