Entities & Atributes:

1. Branches
    a. branch_id (PK)
    b. location_id(PK)
2. Items
    a. item_id(PK)
    b. item_type_id (FK)
    c. item_status_id(FK)
3. Users
    a. user_id(PK)
    b. type
    c. first_name
    d. last_name
    e. branch_id (FK)
4. Location
    a. location_id(PK)
    b. location_name

5. User Item Status
    a. item_status_id(PK)
    b. item_status_name (includes: in transit, on hold, available, checked out)
6. User Type
    a. user_type_id(PK)
    b. user_type_name (includes:Librarians, Patrons, Externa Systems)
7. User Action
    a. user_action_id(PK)
    b. user_action_name(includes: cancel, reserve, renew, etc.)
8. Item Type
    a. item_type_id(PK)
    b. item_type_name(includes: book, dvd, cd)
9. User_Item (mapping table
10. Fine

Overview:

Based on the scenarios, I defined the three main Entities: User, Item, Fine which have their independent attributes. Most of the entities are one-to-many relation with each other. However, I am here assuming there is only one library per location, and that is why I am saying it is a one-to-one relationship between Branches and Location. The main interation between user and item happen in the connecting table user_item, which contains every interaction/transaction. For User Type, Location, User Action, Item Status, and Item Type, they serve more like a list of enums that can be scaled up if there are more actions, statuses and etc are added later on.

Decision Making:

1. Nullable:
    a. Since only Patrons and Librarians can pay fines, the fine_id should be able to be set to null for other types of users
    b. Since only a certain types of items have a due_date attribute for a certain actions, then it should be null for the rest. For example, cancelling an item should not have a due date where as checking out an item should.

2. Indexes:
    It can be later added to fulfill users' requests as they have them

3. Foreign Keys:
    It is mostly based on the relationship between the tables

Concerns and Solution:

As of now, the system seems to be pretty small, however considering possible expansion, I am setting User Type, Location, User Action, Item Status and Item Type into their own table to assure maintainability if they ever grow.