

## G137

1. If a manager does not manage a branch any longer, we will not regard him as a manager anymore.
2. If a manager is unavailable, managers will be switched so that branch will have a manager hence the relationship is one to many between them.
3. Reading levels are only applied to fiction books. But it can be null when the classification is “reference”.
4. Unique in-house numerical codes are separate codes; there is an author code (or id) used to identify authors, and a publisher code (or id) used to identify publishers.
5. When a borrower checks out multiple books, at the same time, each book is recorded/regarded as a separate loan.
6. A given branch will only be assigned as the home branch for a single manager.
7. Assumptions about the business rule: users of this database need to use managers’ and borrowers’ homebranch to register their identities and organize their activities.

New assumptions and justifications in Logical model:

8. We use check clause to record the status of books being stolen, lost or damaged, because it can simple be stored in the attribute without needing an external lookup. This solves the problem without adding additional tables and is the faster solution. The check constraint is of two characters which can explicitly define the status of the book. It is also convenient for the end user to easily identify the status and update the status of the book when required, without any anomalies.
9. Reservation surrogate key: We use a surrogate key to uniquely identify the reservations and reducing duplicate attributes making it easier to manage relationships and foreign keys. This ensures simplicity in the schema for potential future users. This also follows the unit principles of adding a surrogate key when there are more than 2 attributes in the primary key.
10. Loan surrogate key: Adding a surrogate key to the loan entity makes sure there is a unique identifier for each loan record, simplifying relationships and improving query

efficiency and manage foreign keys. This eliminates the need for composite keys and ensures easier management of loan data as the system scales. This also follows the unit principles of adding a surrogate key when there are more than 2 attributes in the primary key.