

To ensure the validity and consistency of the conceptual diagram, the following assumptions are made:

Assumptions Made Between LGA And BRANCH Entities:

- 1) It is assumed that the library system only records an LGA that oversees library services in its area, so each LGA must have at least one branch.
- 2) It is assumed that each branch cannot exist without being associated with an LGA, each branch belongs to exactly one LGA in minimum.
- 3) LGAs are unique geographical or administrative areas, each of which is charged with the delivery of public services such as libraries in its jurisdiction. Thus, it is assumed that a branch can only belong to that particular LGA but not multiple LGAS.

Assumptions Made Between BRANCH And MANAGER Entities:

i) Branch - Manager Relationship:

- 1) It is assumed that a manager must manage at least one branch as from the question it states that all managers are assigned one particular branch as their home branch, meaning every manager must have managed at least one branch which is their home branch.

ii) HomeBranch relationship between BRANCH and MANAGER entities:

- 1) It is assumed that a manager may manage multiple branches but only one of these branches will be designed as the home branch, thus there could be some branches that are not the home branch of any manager.
- 2) It is assumed that once a given branch is assigned as home branch for a single manager. The same home branch cannot be registered as the home branch of other managers.

Assumption Made Between BRANCH and BOOK entities :

- 1) It is assumed that a branch might exist without a book initially for example a newly opened branch, meaning in minimum a branch can have 0 book.

Assumption Made For HomeBranch Relationship Between BRANCH and BORROWER entities:

- 1) It is assumed that a borrower can only have exactly one and only one home branch which is the branch where the borrower registered as a borrower, with maximum and minimum cardinality of 1.
- 2) It is assumed that a branch can have a minimum of 0 borrowers registered , meaning it is possible that a branch exists without anyone registering as a borrower at that branch.

Assumption Made For The Relationship Between BORROWER and LOAN Entities:

- 1) It is assumed that a borrower can exist without having borrowed any book yet after registering as a borrower , so does not have any loan .

Assumption Made For Relationship Between BOOK and LOAN entities.

- 1) It is assumed that it is possible where a book might not being loaned out immediately as it is a newly added book to the library, so a book can have 0 loans.
- 2) It is assumed that it is impossible for a loan to exist without referencing a particular book copy that is being loaned out.
- 3) It is assumed that a loan transaction must deals with a single book copy , a loan cannot involve multiple book copies in the same loan, Each loan is referring to a single book copy.

Assumption Made For Relationship Between BOOK and ISBN entities:

- 1) It is assumed that every book copy must have an ISBN to identify the specific edition or format the book copy belongs to , so book copy cannot exist without an ISBN .
- 2) It is assumed that a book copy can have a maximum of only one ISBN because it belongs to a specific edition, meaning it cannot represent multiple editions.
- 3) It is assumed that it is possible for multiple copies of the same edition of a book to exist across different branches or within the same branch , thus an ISBN can be linked to multiple book copies.

- 4) It is assumed that an ISBN can exist without any physical copies of the book being available or purchased as the book may be on order or reserved for future acquisition.

Assumption Made For Relationship Between CATALOGUE and ISBN entities :

- 1) It is assumed that a catalogue cannot exist without at least one ISBN because without an ISBN, the catalogue entry wouldn't be able to track or distinguish different editions of the book, this is important for both inventory management and user access in the library system.
- 2) It is assumed that each ISBN is linked to one and only one catalogue entry because ISBNs reflect specific editions or versions of books, and so it is impossible that one version is catalogued two different ways. Hence, one ISBN corresponds to a single catalogue entry only.

Assumption Made For Relationship Between CATALOGUE and AUTHOR entities:

- 1) It is assumed that every author who is recorded in the system has written at least one book that is catalogued in the library , meaning the author must appear in at least one catalogue .

Assumption Made For Relationship Between CATALOGUE and PUBLISHER entities:

- 1) It is assumed that every catalogue entry must have one and only one publisher , meaning every book listed in the catalogue is published by a single publisher .
- 2) It is assumed that the library system only records publisher that have published at least one book that is included in the catalogue of the library , thus a publisher will have published at least one catalogue entry with minimum cardinality of 1.