Chicago public library database design

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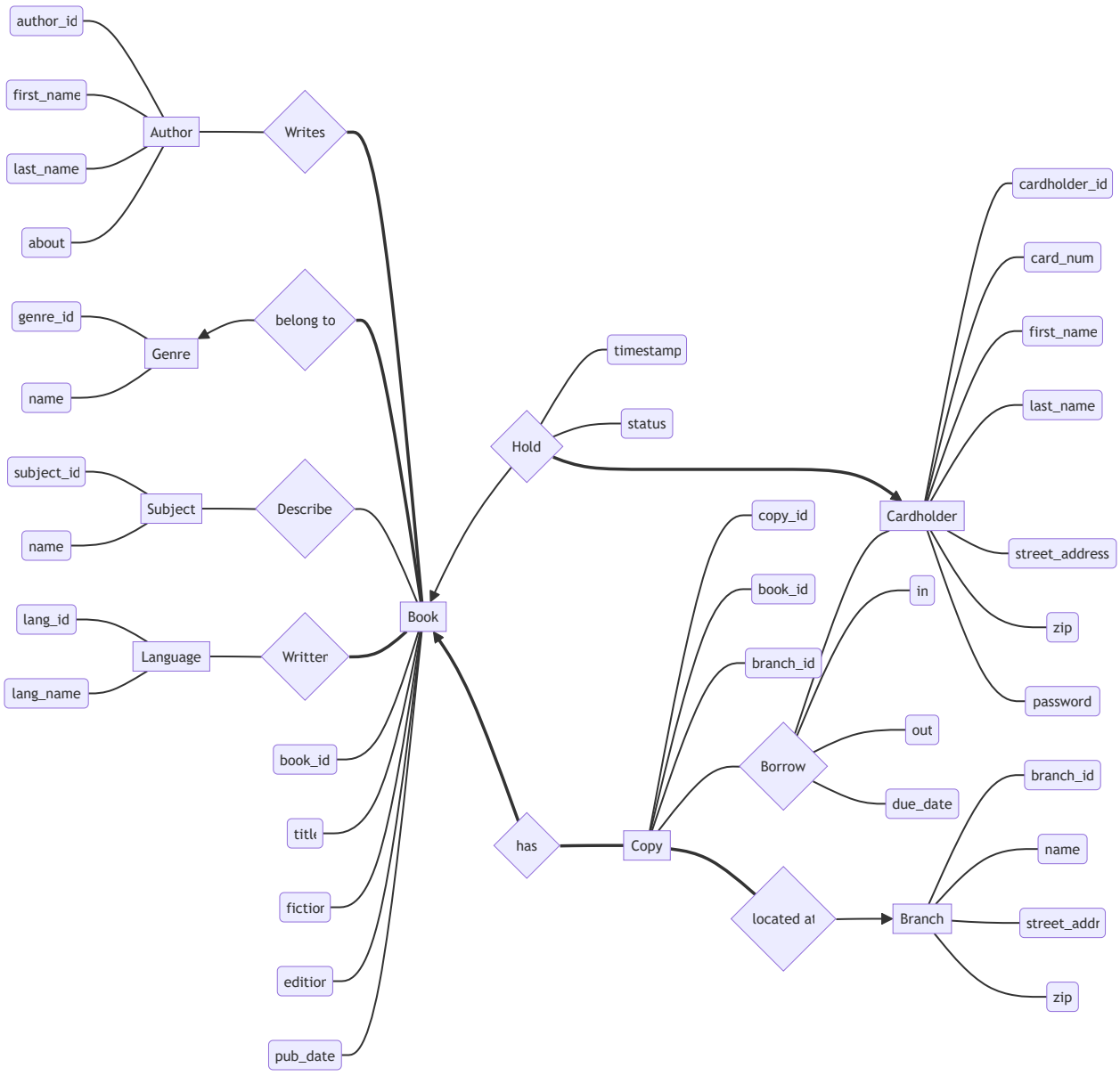
Entity Relationship Diagram



Relational Schema

The main entities, including all necessary data for books & where they're stored:

1. `Book(id, isbn, title, genre_id, fiction, edition, pub_date)`
2. `Author(id, first_name, last_name, about)`

3. `Genre(id, name)`
4. `Subject(id, name)`
5. `Language(id, name)`
6. `Copy(id, book_id, branch_id)`
7. `Cardholder(id, card_num, first_name, last_name, password, street_addr, zip, phone, email)`
8. `Branch(id, name, street_addr, zip)`

The following bridge entities are used to handle checking borrowed books in/out or placing/modifying hold requests, as well as any other many-to-many relationships:

1. `Borrow(copy_id, cardholder_id, out, in, due_date)`
2. `Holds(timestamp, book_id, cardholder_id, status)`
3. `AuthorWriteBook(book_id, author_id)`
4. `SubjectDescribeBook(book_id, subject_id)`
5. `LanguageWrittenInBook(book_id, language_id)`

Business Rules

1. An Author can write one or more Books; however, every Book is written by at least one Author.
2. One Genre can contain one or more Books; however, every Book belongs to exactly one Genre.
3. One or more Subjects may describe a Book. One or more Books may be described by a Subject.
4. One or more Languages can be used to write a Book; a Book must be written in at least one Language.
5. A Book may be requested for Hold by one or more Cardholder. A Cardholder may request a Hold for one or more Book.
6. A book Book may have one or more Copy; however, every Copy has exactly one Book.
7. A Copy can have one or more Borrow records for one or more Cardholder. A Cardholder can have one or more Borrow records for one or more Copy.
8. A Copy must be located at exactly one Branch; however; a Branch may have one or more Copy.