

# Chicago public library database design

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

1. Book(bid, isbn, title, genre\_id, fiction, edition, pub\_date)
2. Author(aid, first\_name, last\_name, about)
3. Genre(gid, name)
4. Subject(sid, name)
5. Language(lid, name)

6. Copy(cid, book\_id, branch\_id)
7. Cardholder(chid, card\_num, first\_name, last\_name, password, addr\_num, addr\_street, addr\_apt, addr\_city, addr\_state, addr\_zip, phone, email)
8. Branch(brid, name, addr\_num, addr\_street, addr\_apt, addr\_city, addr\_state, 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. Cardholder\_Copy(copy\_id, cardholder\_id, out, in, due\_date)
2. Book\_Cardholder(timestamp, book\_id, cardholder\_id, status)
3. Author\_Book(book\_id, author\_id)
4. Subject\_Book(book\_id, subject\_id)
5. Language\_Book(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 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.