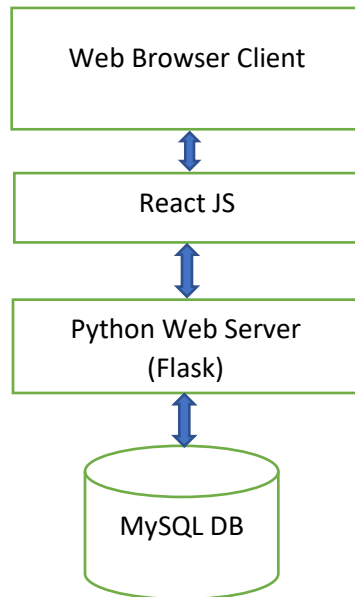


DESIGN DOCUMENT

SYSTEM:

Library Management system designed as a single page web application.

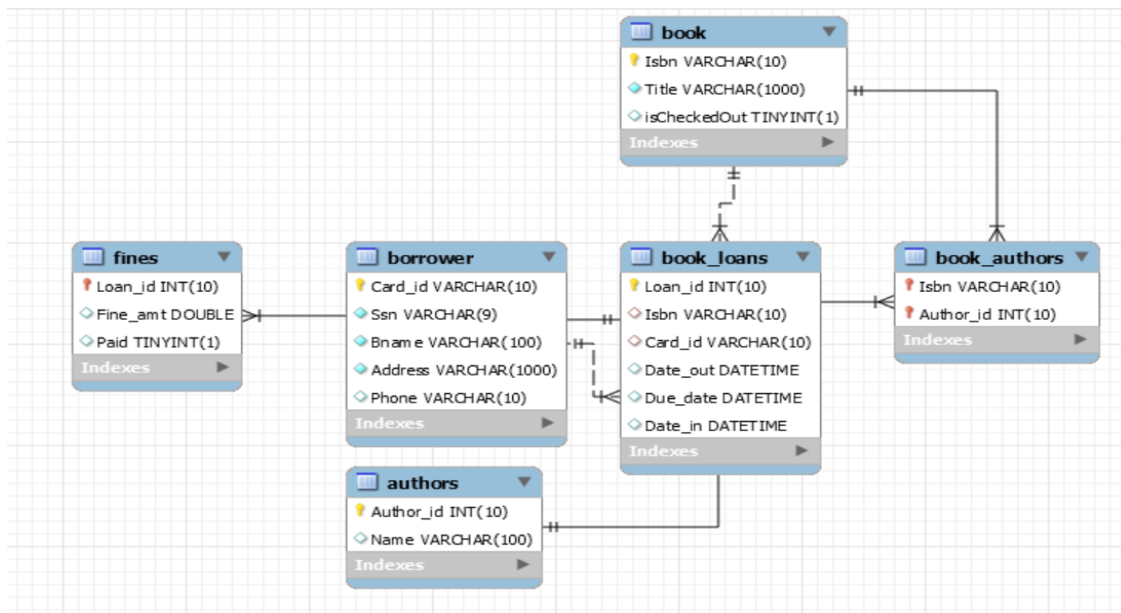
SYSTEM ARCHITECTURE:



- **Front end** – React JS + Html + Bootstrap CSS
 - Dependencies:
 - *Babel* – To transpile ES6 code to raw js code.
 - *css-loader* – load css files.
 - *extract-text-webpack-plugin* – Extract css code. Webpack by default considers everything as raw js.
 - *Jquery* – Used for ajax calls.
 - *react-dom* – Virtual DOM
 - *sass-loader* – loads sass files.
 - *style-loader* – loads styling files.
 - *Webpack* – Used for building the application,
 - *Immutable* – JS library with immutable data structures. Used for representing state variables.
 - *redux-thunk* – middleware for maintaining state.
 - *react-redux*, *redux* – libraries to maintain state of the application.
 - *react-router* – library to manage routes.
 - *react-immutable-proptypes* – Used for immutable props for the class.
 - *es6-promise* – library that allows coding es6 promises.

- **Server** – Flask(Python)
 - Libraries:
 - *mysql.connector* – connector to interact with mysql
 - *json* – library to handle json manipulations
 - *datetime* – used for datetime manipulations
- **Back End** – MySQL. Connected using root credentials.

DB Design Diagram:



Additional attributes: *isCheckedOut(bit)* in “Book” table to keep track of a book’s availability

Design Decisions and Assumptions:

- **Initial Data:**
 - Took only the required attributes.
 - *Books.csv*
 - Attributes not included:
 - Cover
 - Publisher
 - Pages
 - Took each instance of an author name as a unique author. Ex: Three instances of John Smith will have 3 unique authors as John Smith.

- *Borrowers.csv*:
 - Attributes not included:
 - Email
 - SSN – stripped off hyphens and stored it as a 9 digit string.
 - Combined address, city, and state into a single multi-valued attribute 'Address'.
 - Phone – stripped off all brackets and hyphens and stored it as a 10 digit string.
- **Search:**
 - Doesn't distinguish between dialects of a character
 - Eg: Å å Ä considered as letter 'a'
 - Paging is not supported. All search results are displayed in the single page
- **Check-Out:**
 - There is only one copy of each book.
- **Borrower Management:**
 - ID generation: $"ID" + \max(userId) + 1$
 - Phone number cannot be an international number. It should be a local number with area code and no international code.
- **Fines:**
 - Paid fines are filtered by default.
- **Time zone:**
 - The system and user are in the same time zone.
- **Data Transfer:**
 - Server requests are through Ajax.
 - Data packets are sent and received as JSON.
- **State:**
 - Maintains only local state - When you navigate between tabs, the info in the previous tab is lost.
- **Supported number of Users: 1**
- **Supported number of instances: 1**
- **Supported Language: English(US)**
- **Supported Browser: Google Chrome**