CRUx Dev Induction Round 3: Web Development

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Duration: 10 days

You will build an website with a backend in Express.js, and TypeScript and a frontend in Svelte or React during this task.

Task: Build a Library website

1. Your website should have the following features:
    a. Basic CRUD functionality for users
        i. Every user should have an email, a name, and a username/handle.
        ii. Users should be authenticated with Google OAuth, and only users from the BITS organization should be able to login.
    b. Two types of users: User, and Admin
        i. Admins should be able to CRUD Users
    c. Basic CRUD functionality for books:
        i. Admins should be able to CRUD books
        ii. Books should have a name, genre, author, a code for where it is placed, how many copies are available in the library, and a count for how many of the copies have been borrowed.
        iii. Users should be able to look at the books available, and the results should be paginated

    d. Users should be able to borrow books for a fixed period of time. At any point a user can borrow a maximum of 3 books.
    e. Admins should be able to mark a book as returned. This will only increase the number of books available for borrowing by 1, not by the number of copies of the book.
2. Figure out the fastest and most secure way to use JWTs for authentication, and implement it. If you don't have the time to implement it, at least read up on it, and we might have a discussion about this during the interview.
3. You should be able to filter by Genre, and filter by Author. The results should, of course, be paginated.
4. Cache search results and book information in Redis, and use LRU, and set an expiry time for cached results.
5. Use a message broker or Event Queue like RabbitMQ or Kafka to allow users to schedule email reminders at certain dates for custom messages, for e.g. Reminders for returning a book, or reminders for completing some chapters in the book, etc.
6. **Brownie points:** Users should be able to subscribe to a book, and should receive email notifications when the book is available again for issuing.

You'll be judged on the following

1. Coding best practices (modularity, conciseness, etc.).
2. How well and fast you pick up new concepts.
3. Having clear concepts (including relevant theory) on what is being used in the said tasks, and in general what frameworks you use.

4. How secure your API is, and various measures against some basic vulnerabilities.
5. How well you handle errors.

General Instructions

1. Do not plagiarize, but feel free to use the internet.
2. Use git to record your progress over the given period, and label your commits properly.
3. Once done with your tasks, write a post on the CRUx community forum regarding the same. The post is not part of the inductions, it's for future applicants and the GB to check out your projects. Follow a similar pattern to those who posted from previous inductions.
4. If you have problems with any task, feel free to ask the task setters/mentors.
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