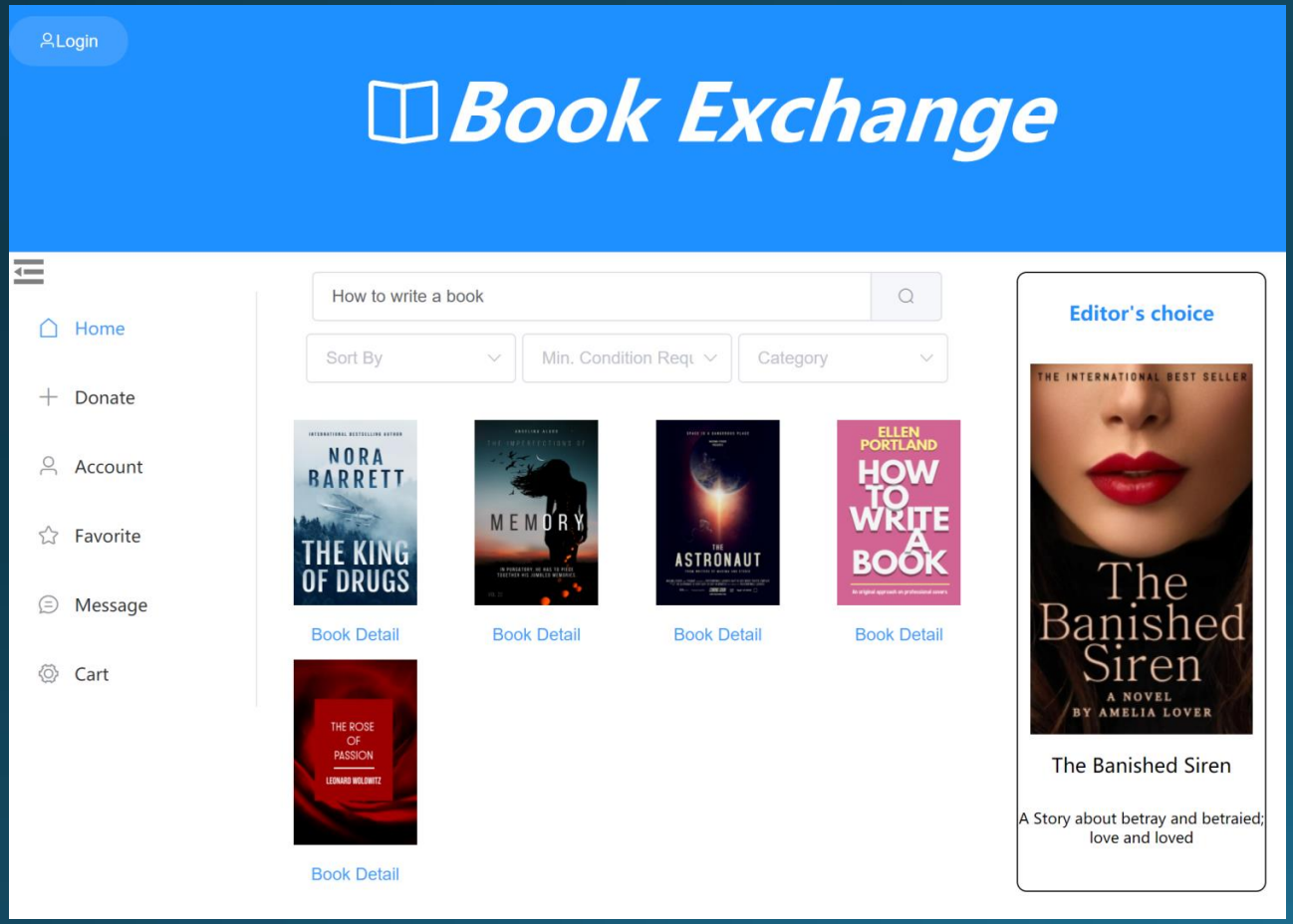
Book Exchange

A web service for exchanging second-hand books



Motivation

- A platform encourages people to exchange books
- Save money to buy new books
- The more books you donate, the more books you can request from others
- Welcome users with similar interests to contact each other

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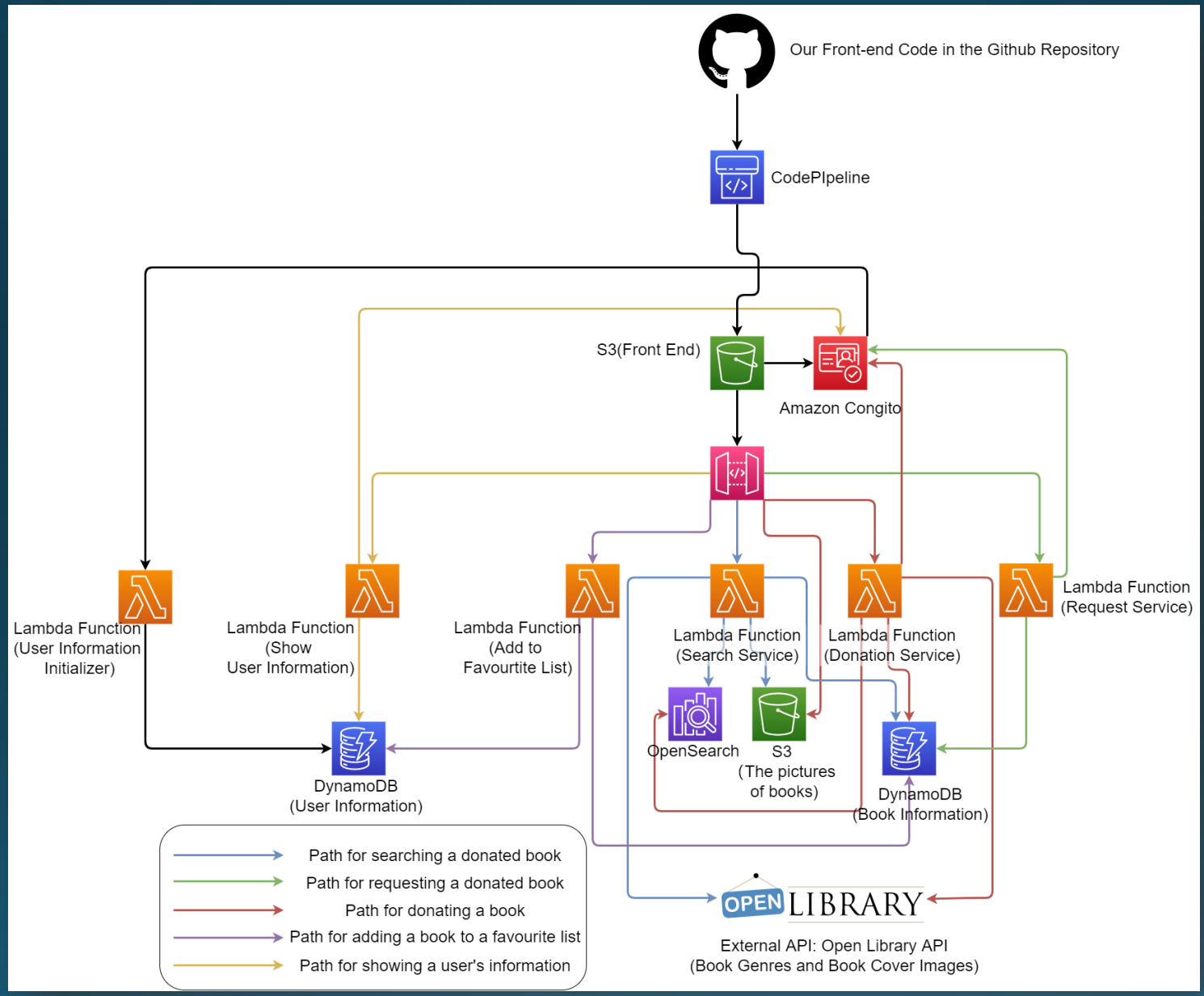
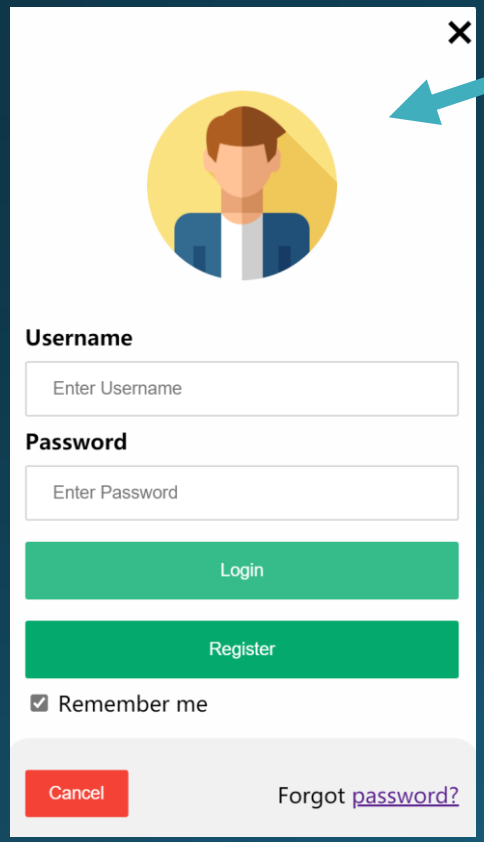
Structure Overview



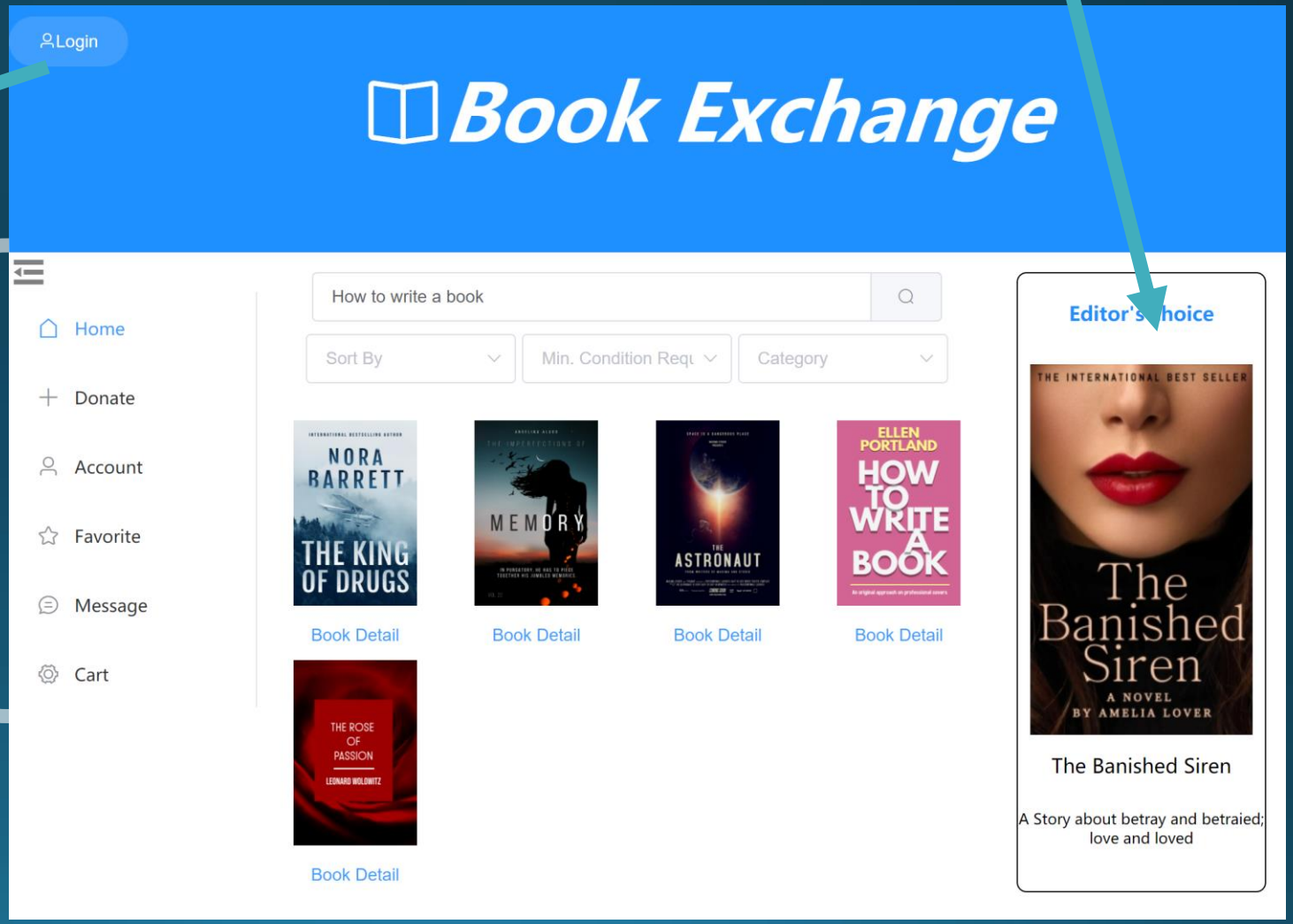
Front-End Overview

Login/Registration Panel



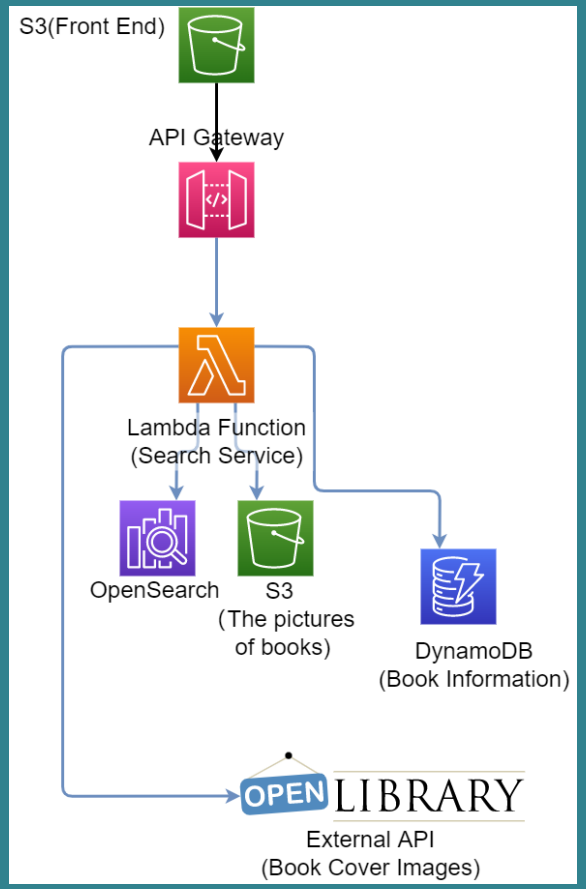
Function Panel

Editor's choice

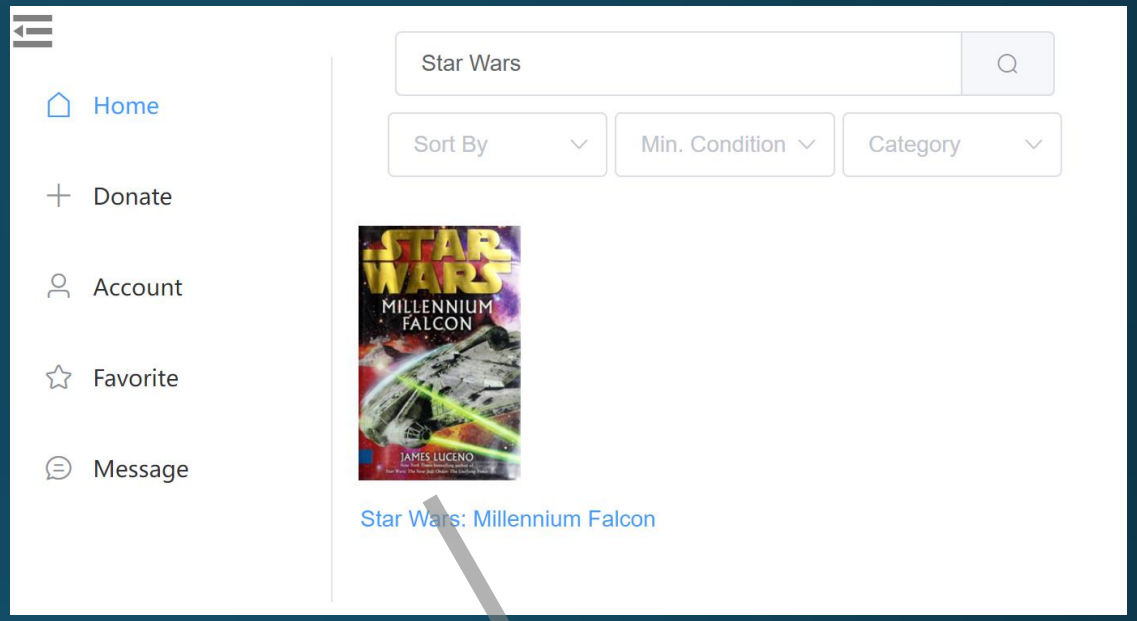


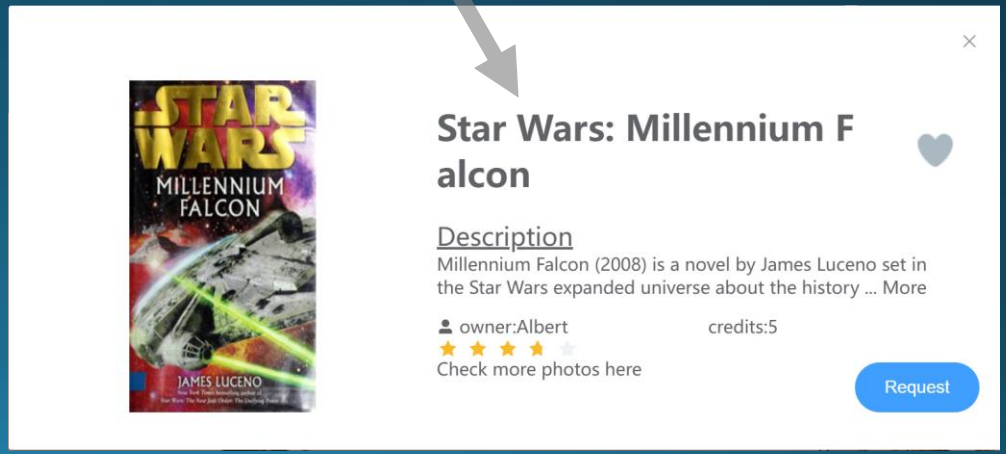
Search for a second-hand book

Implementation Detail



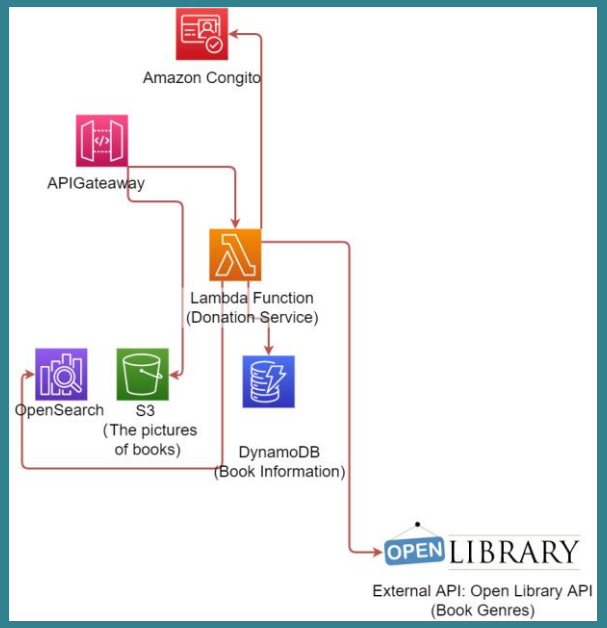
- Using API Gateway to pass the query infomation from frontend input to lambda function
- Using a lambda function to query corrsponding available donation books ftom DynamoDB through OpenSearch.
- The lambda function also automatically get the book cover by using Open Library API and upload pic from S3
- Frontend get the response from the image and display it under the search bar



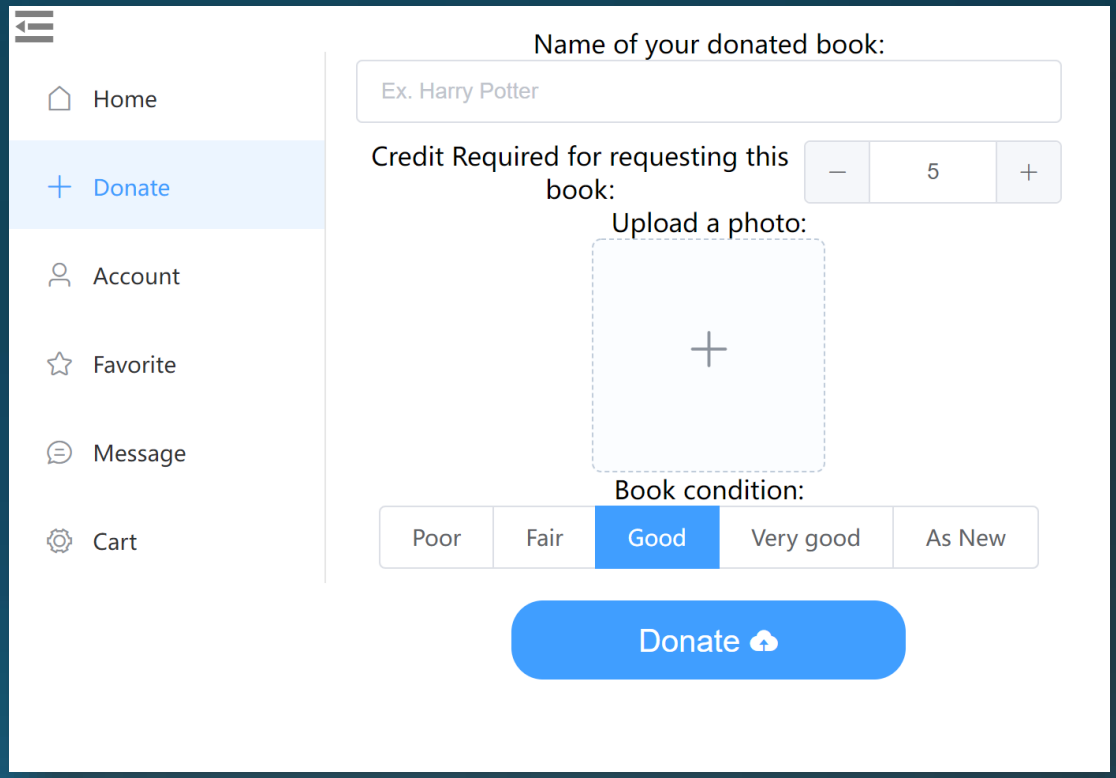


Donate a second-hand book

Implementation Detail



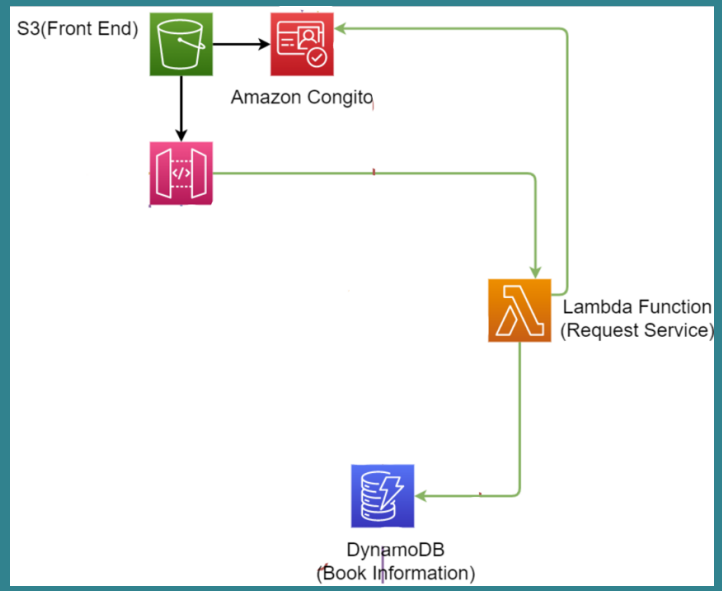
- Using API Gateway to pass the photos directly to a S3 bucket
- Using a Lambda Function to add the donation information to DynamoDB and OpenSearch.
- The lambda function automatically generates the genre information for the donated book by using Open Library API. This can help other users find the book they want by genre.



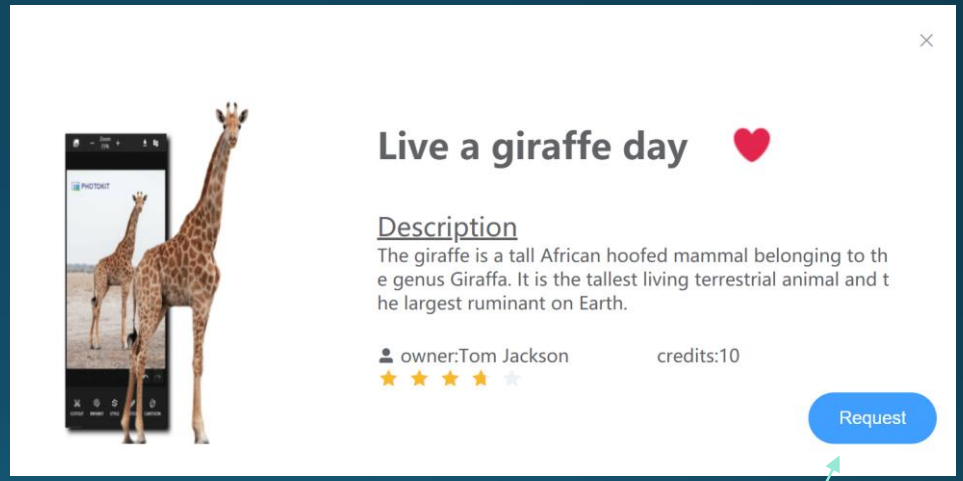
Donation Panel: The user can only donate a book when they have logged in.

Request a second-hand book

Implementation Detail



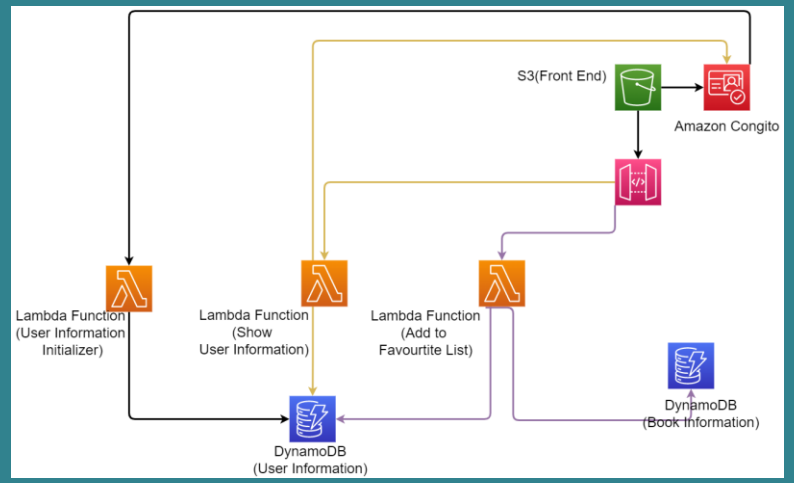
- Determine whether the user has enough credits to make request
- Once successful requested, update user history (add book_id)
- Update book information to set status='unavailable', so it will no longer be searched



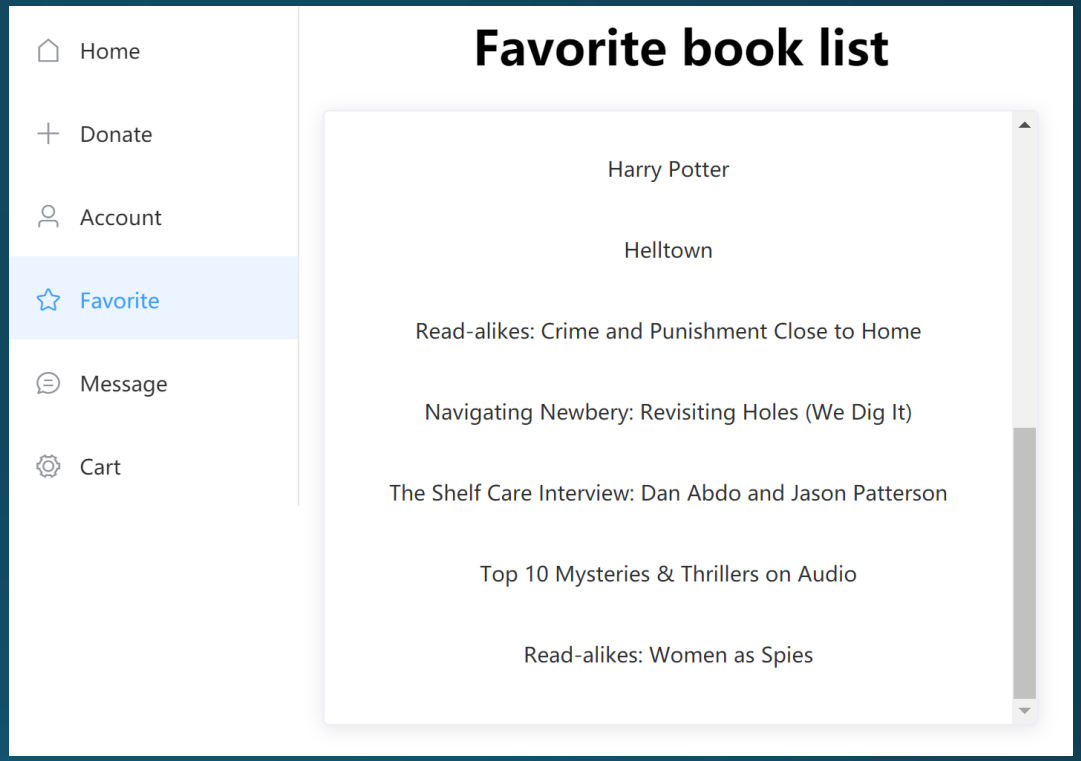
Click to request the book you want!

Show user's info & add to favorite list

Implementation Detail



- Every time the user selects a book they like, the system firstly will store this book's id in Dynamo DB(user information) corresponding to the user.
- When the user jumps to the favorite list page and want more information about these books, the system will search it in the DynamoDB(book info) by id
- When the user chooses to add a book to their favorite list, the count of favorite' for that book will increase by 1 and the book is removed when the user double click



You can add a book to your list here!

Some Design Choices

Although we can link user's account and their information directly in Cognito (which is convenient and good for keeping user's information secure!), we decided to use ***DynamoDB*** to store the users' non-sensitive information, rather than storing them in ***Cognito***.

- The attributes stored in Cognito has to be key-value(string) pair, not good for complicated data structures.
- We need to store many users' requested/donate books, this list could be large and Cognito is not scalable as the DynamoDB.
- The DynamoDB can handle query much more efficient than Cognito
- We realized this is the pattern often done in the industry after searching the online information

We does not use OpenSearch to store the availability of the book (i.e. already rent/available for request)

- We stores the genres, book name, and donation id to the OpenSearch to improve the performance of searching.
- Storing availability can help us filter out those unavailable books for search.
- However, this would requires us to update OpenSearch each time there is a book was requested.
- Given the current expected number of users (~10000 users in total) is not too large, it seems okay to get all the books fulfilled the search request and then filter out those unavailable.
- This design may need to be changed when the expected number of user become larger.