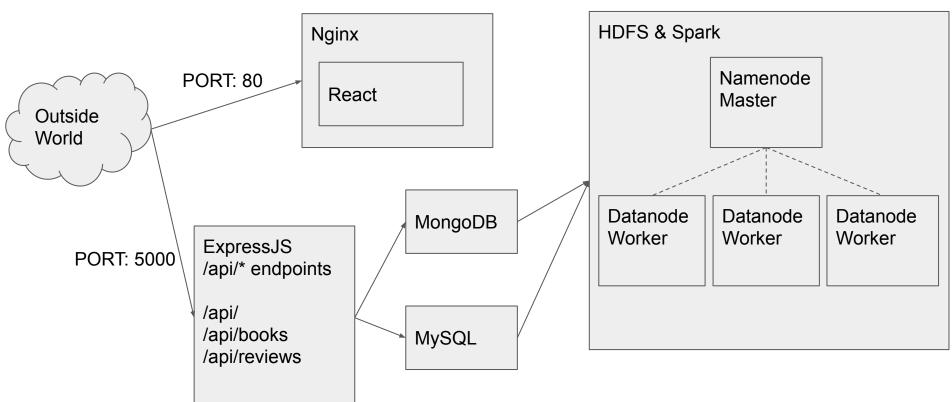
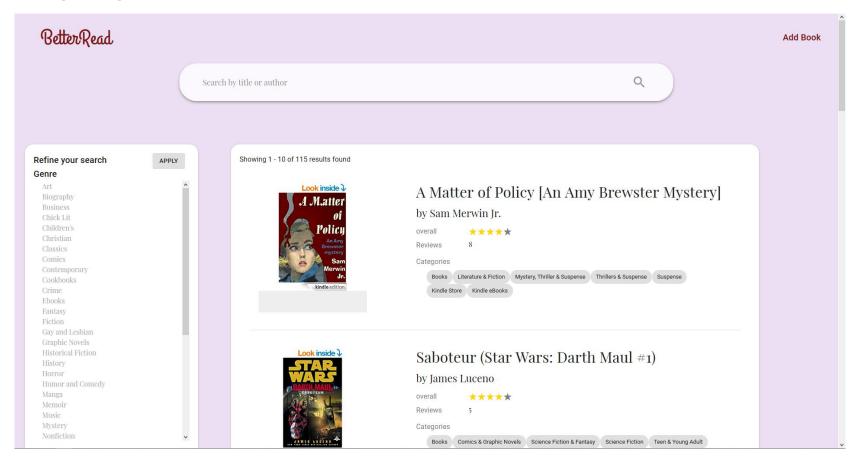
# Betterread

# System Overview

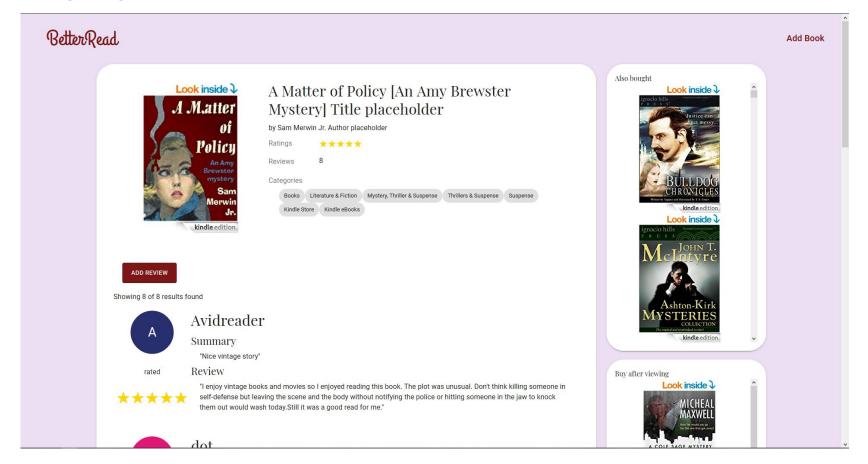


# Website Overview

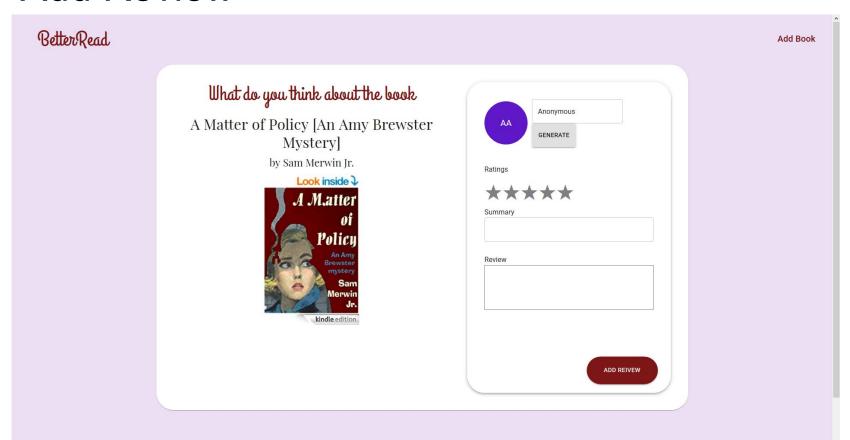
### Home



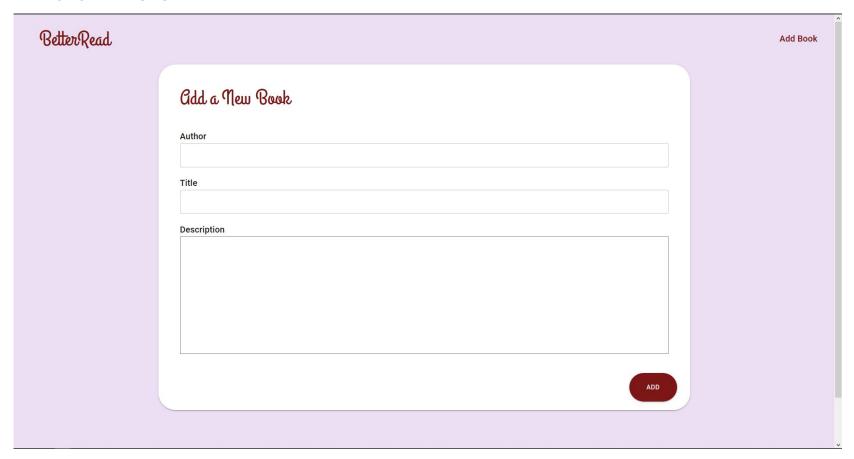
### Review



### Add Review



## Add Book



## **Endpoints Overview**

```
betterread-server > Js api.js > ...
      const express = require("express");
      const router = express.Router();
      const { mongoClient, mysqlClient } = require("./database");
      COUNT LIMIT = 3000;
 7 > router.get("/", (req, res) => { ...
128
129 > router.get("/review", (req, res) => { ···
152 > router.get("/book", async (req, res) => { ···
212 > router.post("/book", async (req, res) => { ···
    > router.post("/review", (req, res) => { ...
      module.exports = router;
253 > function getRatings(ratings) { ···
264 > async function LOG(req) { ···
```

## **Features**

- 1. Add new book
- 2. Add new review
- 3. Get reviews by asin
- 4. Search book from author and title
- 5. Filter books by genre and ratings
- 6. Random name generator for reviewer

#### **Databases**

#### Data Schema

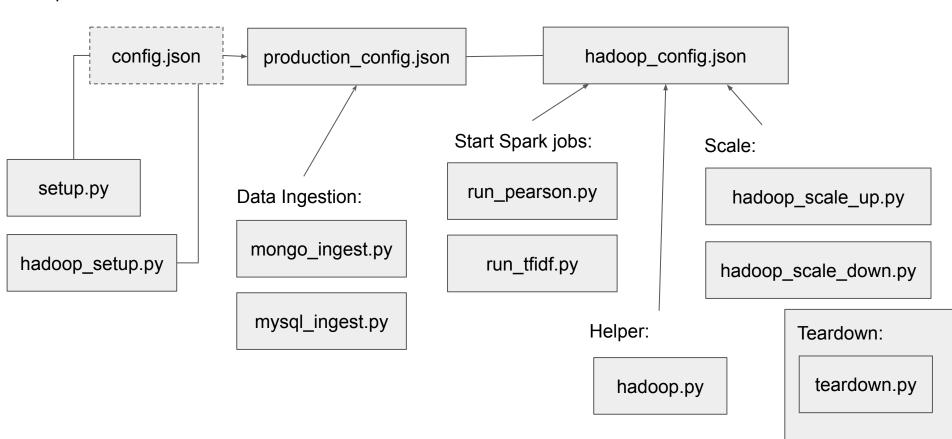
- 1. Books Metadata (MongoDB)
  - · id: ObjectId, primary key
  - · asin: String
  - price: Double
  - imUrl: String
  - · related: Object
    - o also bought: String[]
    - buy\_afterviewing: String[]
  - categories: String[]
  - title: String
  - · author: String
- 2. Logs (MongoDB)
  - timeStamp: String
  - reqType: String
  - resCode: Number
  - url: String

#### 3. Review Data (MySQL)

- id INT(11) NOT NULL AUTO\_INCREMENT
- asin VARCHAR(255) NOT NULL,
- helpful VARCHAR(255) NOT NULL,
- overall INT(11) NOT NULL,
- reviewText TEXT NOT NULL,
- reviewTime VARCHAR(255) NOT NULL,
- reviewerID VARCHAR(255) NOT NULL,
- reviewerName VARCHAR(255) NOT NULL,
- summary VARCHAR(255) NOT NULL,
- unixReviewTime INT(11) NOT NULL,PRIMARY KEY (id));

## Automation

Setup:



## Spark jobs

#### Tfidf

- Import MYSQL table containing the reviewText into hadoop
- 2. tokenize the data into a list of words.
- calculate the term frequency(tf) values for each word storing them as vectors
- calculate their inverse document frequency(idf), treating each review as 1 document
- 5. get the actual word from their index in the vectors
- return it as a csv file.

#### Pearson Correlation

- 1. Get the reviewText from MySQL database
- compute the average review length for each book
- get the price of book from MongoDB books metadata
- 4. combine both the values into one dataframe
- 5. execute the calculation for Pearson Correlation according to this formula:

$$r = \frac{n\sum xy - \sum x\sum y}{\sqrt{(n\sum x^2 - (\sum x)^2)(n\sum y^2 - (\sum y)^2)}}$$

# Improvements made

- 1. Title, author crawler (from Goodreads)
- 2. Reduced initial query time from ~45 seconds to < 3 seconds, by grouping queries & creating index
- 3. Extra feature: Random name generator

## **Future works**

- 1. Scale Spark workers together when hadoop is scaled
- 2. Upload results of Spark jobs to cloud for access
- 3. Better way of organizing data for easier access (e.g. collections of books)
- 4. Prefetch queries
- 5. Better scripts organization