Project 4 Task 2 Writeup - BookScout App Pareera Uqaily (AndrewID: puqaily)

Welcome to the BookScout App!
Use our mobile interface to search for books using the OpenLibrary API and view analytics of your search activity using our dashboard. The app takes a search string from the user and uses it to fetch the book title and author from the OpenLibrary API.

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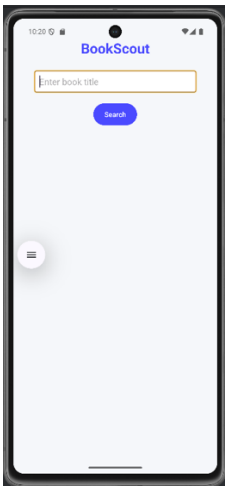
1. Native Android Application

The name of my native Android Studio project is Project4Android_BookScout.

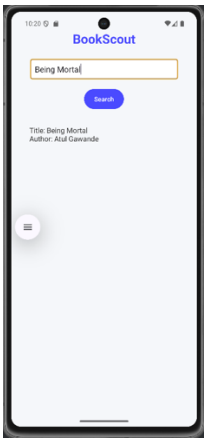
a. At least three different kinds of Views in the Layout
The layout (activity_main.xml) uses:

- TextView: Displays the app title and the author as a result
- EditText: For the user to enter the book title
- Button: For submitting the search request

Screenshot of screen before result is fetched:

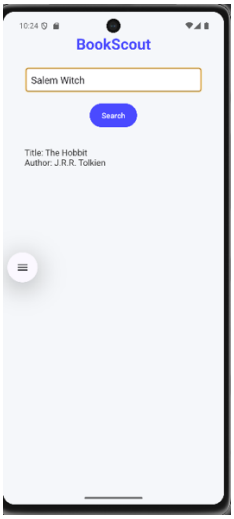


Screenshot of screen after result is fetched:



b. Requires input from the user
The user enters a book title into the EditText field to search for a book.

Screenshot of user searching for a Salem Witch Trials book:



c. Makes an HTTP request to the web service
MainActivity.java makes an HTTP GET request to the web service on button click. The request is sent to:

"http://10.0.2.2:8080/Project4Task2/search?title=" + encodedTitle + "&model=" + encodedModel;

where encoded title is the searched title and encoded model is the device of the phone used. The search is then carried out via request through the web app and a response from the API is populated on the screen.

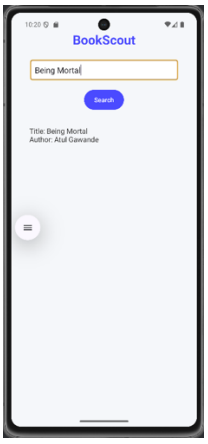
d. Receives and parses JSON reply
The response is JSON. Example:

{"title":"The Great Gatsby", "author":"F. Scott Fitzgerald"}

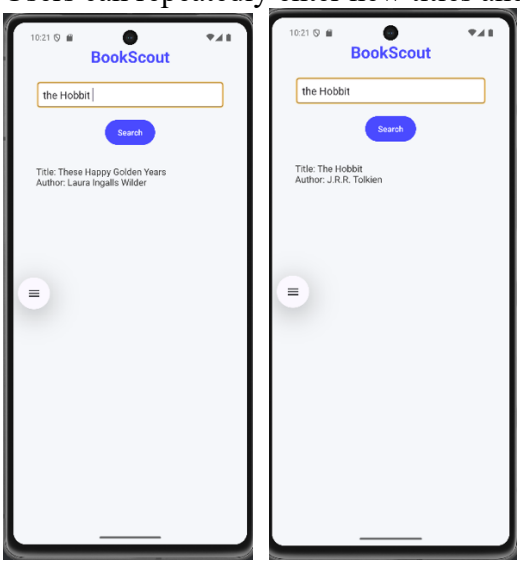
This JSON is parsed using org.json.JSONObject.

e. Displays new information to the user
The title and author are displayed in the TextView element labeled resultText.

Here is a screenshot:



f. Is repeatable
Users can repeatedly enter new titles and get updated results without restarting the app.



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2. Web Application (Web Service)

The IntelliJ project is named Project4Task2. The web service is implemented using Servlets and deployed via TomEE.

a. Simple API with Servlets
The API path /search is defined in BookSearchServlet.java.

b. Receives HTTP GET request from Android app
The servlet receives the title and model as query parameters.

c. Executes business logic using OpenLibrary API
The servlet fetches data from:

https://openlibrary.org/search.json?title=<title>

It extracts the book title and author from the JSON response.

d. Responds with JSON to the Android app
Custom JSON response is returned in the format:

{"title":"...", "author":"..."}

Only required data is returned (no excess information).

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4. Log Useful Information

The MongoLogger.java logs 7 key attributes per request:

- Timestamp of request
- Phone model from Android device
- Book title searched
- OpenLibrary API URL
- OpenLibrary response latency (ms)
- Final result book title
- Final result author

These were chosen to capture user/device behavior and API performance.

Top 3 Phone Models

Pixel 7 — 5 searches
Google sdk_gphone64_x86_64 — 2 searches
iPhone 16 — 2 searches

Recent Search Logs

Timestamp	Phone Model	Title	Author	Latency (ms)
2025-04-06T21:49:06.918623Z	Pixel 7	The Hobbit	J.R.R. Tolkien	8069
2025-04-06T21:49:57.394230Z	Pixel 7	The Hobit	John Carratello	1162
2025-04-06T21:50:33.204364Z	Pixel 7	The Great Gatsby	F. Scott Fitzgerald	6316
2025-04-06T21:50:38.236954Z	Pixel 7	The Great Gatsby	F. Scott Fitzgerald	4971
2025-04-06T22:10:42.487339Z	Pixel 7	The Hobbit	J.R.R. Tolkien	6684
2025-04-06T22:15:50.433902Z	iPhone 12	The Hobbit	J.R.R. Tolkien	6614
2025-04-07T04:40:26.542690Z	iPhone 16	Fundamentals of Pathology	Husain A. Sattar	14491
2025-04-07T04:41:21.045752Z	iPhone 16	Fundamentals of Pathology	Husain A. Sattar	6347
2025-04-07T05:39:20.160870Z	Google sdk_gphone64_x86_64	Algorithms to Live By	Brian Christian	2172
2025-04-07T05:41:06.773514Z	Google sdk_gphone64_x86_64	Being Mortal	Atul Gawande	875

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5. Store the Log Information in MongoDB

MongoDB Atlas is used with the following connection string:

mongodb+srv://puqaily:1o1qI6lkoZG1XzbM@librarycluster.umhu4.mongodb.net/?retryWrites=true&w=majority&appName=LibraryCluster

Logs are inserted into the logs collection within the LibraryDB database using the MongoDB Java driver.

6. Display Operations Analytics and Logs on a Web Dashboard

a. Unique URL for dashboard
The dashboard is accessed at the /dashboard endpoint via DashboardServlet.java which forwards to dashboard.jsp.

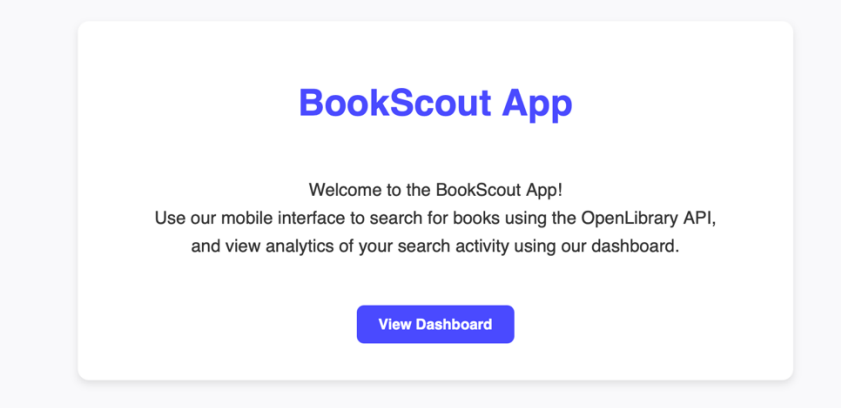
b. Dashboard analytics (rendered using JSP + HTML tables):

- Most searched book titles
- Average API latency
- Most common phone models used

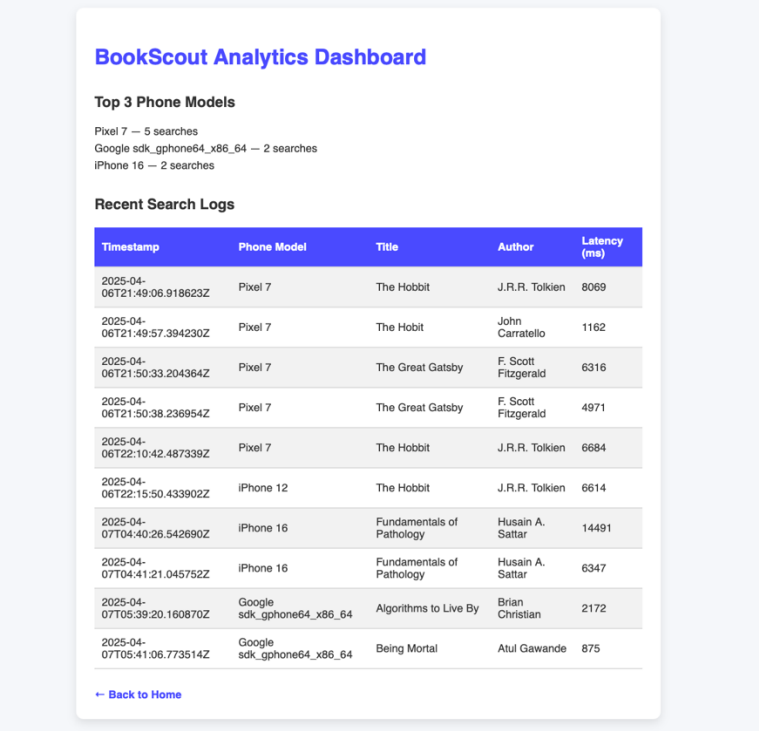
c. Full log display

- Logs are displayed in an HTML table (not raw JSON/XML)
- Each row represents one request with fields

Screenshot of main landing page:



Screenshot of dashboard:



BookScout Analytics Dashboard

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2025-04-06T22:15:50.433902Z	iPhone 12	The Hobbit	J.R.R. Tolkien	6614
2025-04-07T04:40:26.542690Z	iPhone 16	Fundamentals of Pathology	Husain A. Sattar	14491
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7. Deploy the Web Service to GitHub Codespaces

The web service has been deployed via GitHub Codespaces:

- ROOT.war uploaded to the repository
- Port 8080 made public for external access
- Confirmed service works via incognito browser and Android emulator

The Android app uses the local IP 10.0.2.2 for emulator-to-host communication.

Submission Files in Repository

- ROOT.war – deployed web application
- IntelliJ project zip – BookScoutWebService.zip
- Android Studio project zip – BookScoutAndroid.zip
- This writeup – Project4Task2Writeup.pdf