

final_project_overview_mutiapa

April 15, 2023

0.1 Data Sources

1. Google Books API
 - Origin: <https://developers.google.com/books/docs/v1/using>
 - Format: JSON
 - Access: API calls, caching implemented
2. OMDb API
 - Origin: <https://www.omdbapi.com/>
 - Format: JSON
 - Access: API calls, caching implemented
3. IMDb (Web scraping for movie descriptions)
 - Origin: <https://www.imdb.com/>
 - Format: HTML
 - Access: Web scraping, caching implemented
4. News API
 - Origin: <https://newsapi.org/>
 - Format: JSON
 - Access: API calls, caching implemented

0.2 Data Summary

- Google Books API:
 - Records available: Depends on search query
 - Records retrieved: 10 results per page (variable)
 - Description of records: Book information, including title, author, publisher, and publication date
- OMDb API:
 - Records available: Depends on search query
 - Records retrieved: 10 results per page (variable)
 - Description of records: Movie information, including title, director, actors, and release year
- IMDb (Web scraping for movie descriptions):
 - Records available: Depends on the movie
 - Records retrieved: 1 movie description per movie
 - Description of records: Movie description, scraped from the IMDb webpage
- News API:
 - Records available: Depends on search query
 - Records retrieved: 20 results per page (variable)

- Description of records: News article information, including title, URL, source, and published date

0.3 Data Structure and Implementation

The application uses a combination of classes, dictionaries, lists, and JSON files to organize and store the data fetched from different sources.

0.4 Classes

Book: A class to represent individual books, storing information such as title, author, release year, URL, genres, and average rating.

0.5 Data Structure:

- The data structure used in this code is a genre graph, represented by a dictionary with genres as keys and lists of books as values. The genre graph shows the relationship between genres and the books belonging to each genre.
- The genre graph is created using the `create_genre_graph` function, which takes a list of books as input. The function iterates through the books and their genres, adding each book to the corresponding genre list in the genre graph. Here's the code for creating the genre graph:

```
[ ]: def create_genre_graph(book_list):
    """
    Create a genre graph from a list of Book objects.

    Args:
        book_list (list): A list of Book objects.

    Returns:
        dict: A dictionary containing genre as the key and a list of books as
    ↳ the value.
    """
    genre_graph = defaultdict(list)
    for book in book_list:
        for genre in book.genres:
            genre_graph[genre].append(book)
    return genre_graph
```

0.6 Data Structure and Presentation in results.html

The search results are organized into an accordion-style display, which includes sections for Books, Movies, Articles, Most Common Genres, and Highest Rated Books. This allows users to navigate between different categories of search results with ease.

- **Books:** This section displays the list of books fetched from the Google Books API, each with a link to their Google Books page.
- **Movies:** This section displays the list of movies fetched from a movie API, each with their title and a short description.

- **Articles:** This section displays a list of news articles fetched from a news API, each with a link to the article, the source, and the date of publication.
- **Most Common Genres:** This section displays the most common genres among the search results, with a list of books belonging to each genre.
- **Highest Rated Books:** This section displays a list of the highest-rated books in the search results, each with a link to their Google Books page.

0.7 Data Processing

- `search_books()`: A function that searches for books using the Google Books API, processes and filters the results, and returns a list of Book objects and the total number of items.
- `search_movies()`: A function that searches for movies related to a book using the OMDB API and returns a list of movie information.
- `search_articles()`: A function that searches for news articles using the News API and returns a list of article information.
- `create_genre_graph()`: A function that creates a genre graph from a list of Book objects.
- `find_most_common_genres()`: A function that finds the most common genres from a list of Book objects and returns a list of most common genres and a genre graph.
- `find_highest_rated_books()`: A function that finds the highest-rated books from a list of Book objects and returns a sorted list of books.
- `get_movie_description()`: A function that retrieves movie descriptions by web scraping the IMDb webpage using the IMDb ID.

0.8 JSON Files

JSON files are used to cache search results from the Google Books API. The search query and start index are used to name the JSON files, which are stored in a ‘cache’ directory. For example, after searching for “Dragon Ball” here is the ‘Dragon Ball_0.json’ output:

```
{“kind”: “books#volumes”, “totalItems”: 1164, “items”: [{“kind”:
“books#volume”, “id”: “DAsmvwEACAAJ”, “etag”: “0VQz704xqyA”, “selfLink”:
“https://www.googleapis.com/books/v1/volumes/DAsmvwEACAAJ”, “volumeInfo”: {“title”:
“Dragon Ball, Vol. 1 (VIZBIG Edition)”, “authors”: [“Akira Toriyama”], “publisher”: “VIZ Media
LLC”, “publishedDate”: “2008-06-03”, “description”: “A seminal series from a legendary creator.
Dragon Ball, a wry update on the Chinese ”Monkey King” myth, introduces us to Son Go Son
Goku, a young monkey-tailed boy whose quiet life is turned upside-down when he meets Bulma, a
girl determined to collect the seven ”Dragon Balls.” If she gathers them all, an incredibly powerful
dragon will appear and grant her one wish. But the precious orbs are scattered all over the world,
and to get them she needs the help of a certain super-strong boy. The VIZBIG edition of Dragon
Ball contains volumes 1-3, bonus color content and updated text. Before there was Dragon Ball Z,
there was Akira Toriyama’s action epic Dragon Ball, starring the younger version of Son Goku and
all the other Dragon Ball Z heroes! Meet a naive young monkey-tailed boy named Goku, whose
quiet life changes when he meets Bulma, a girl who is on a quest to collect seven ”Dragon Balls.” If
she gathers them all, an incredibly powerful dragon will appear and grant her one wish. But the pre-
cious orbs are scattered all over the world, and Bulma needs Goku’s help (and his super-strength)!
With a magic staff for a weapon and a flying cloud for a ride, Goku sets out on the adventure of
a lifetime...””, “industryIdentifiers”: [{“type”: “ISBN_10”, “identifier”: “1421520591”}, {“type”:
“ISBN_13”, “identifier”: “9781421520599”}], “readingModes”: {“text”: false, “image”: false},
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```

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epic.”}}, {"kind": "books#volume", "id": "iQmqPwAACAAJ", "etag": "2hW9Vt7VuSM", "selfLink": "https://www.googleapis.com/books/v1/volumes/iQmqPwAACAAJ", "volumeInfo": {"title": "Dragon Ball", "authors": ["Akira Toriyama", "Mari Morimoto"], "publisher": "Weidenfeld & Nicolson", "publishedDate": "2005", "description": "Son Goku is a naive young monkey-tailed boy whose quiet life is completely over-turned when he is nearly run over by a precocious and spiky girl caled Bulma. She is on a quest to collect seven Dragon Balls and thereby be granted one wish. she bargained for when she tricks Son to hand over the dragon ball he owns and gets him to join her quest. witty and sharp interplay between Bulma and Goku.", "industryIdentifiers": [{"type": "ISBN_10", "identifier": "0575077417"}, {"type": "ISBN_13", "identifier": "9780575077416"}], "readingModes": {"text": false, "image": false}, "pageCount": 175, "printType": "BOOK", "categories": ["Comic books, strips, etc"], "averageRating": 4, "ratingsCount": 10, "maturityRating": "NOT_MATURE", "allowAnonLogging": false, "contentVersion": "preview-1.0.0", "imageLinks": {"smallThumbnail": "http://books.google.com/books/content?id=iQmqPwAACAAJ&printsec=frontcover&img=1&zoom=5&source=thumbnail": "http://books.google.com/books/content?id=iQmqPwAACAAJ&printsec=frontcover&img=1&zoom=5&source=thumbnail", "language": "en", "previewLink": "http://books.google.com/books?id=iQmqPwAACAAJ&dq=Dragon+Ball&hl=&source=gbs_api", "infoLink": "http://books.google.com/books?id=iQmqPwAACAAJ&dq=Dragon+Ball&hl=&source=gbs_api", "canonicalVolumeLink": "https://books.google.com/books/about/Dragon_Ball.html?hl=&id=iQmqPwAACAAJ"}, "saleInfo": {"country": "US", "saleability": "NOT_FOR_SALE", "isEbook": false}, "accessInfo": {"country": "US", "viewability": "NO_PAGES", "embeddable": false, "publicDomain": false, "textToSpeechPermission": "ALLOWED", "epub": {"isAvailable": false}, "pdf": {"isAvailable": false}, "webReaderLink": "http://play.google.com/books/reader?id=iQmqPwAACAAJ&hl=&source=gbs_api", "accessViewStatus": "NONE", "quoteSharingAllowed": false}, "searchInfo": {"textSnippet": "But the balls are scattered all over the world and Bulma gets much more than she bargained for when she tricks Son to hand over the dragon ball he owns and gets him to join her quest."}}, {"kind": "books#volume", "id": "JYvmBQAAQBAJ", "etag": "4I8bsukEm5I", "selfLink": "https://www.googleapis.com/books/v1/volumes/JYvmBQAAQBAJ", "volumeInfo": {"title": "Dragon Ball Culture Volume 1", "subtitle": "Origin", "authors": ["Derek Padula"], "publisher": "Derek Padula", "publishedDate": "2014-12-21", "description": "See Dragon Ball with new eyes. This book is your cultural tour guide of Dragon Ball, the world2019s most recognized anime and manga series. Over 11 years in development, at over 2,000 pages, and featuring over 1,800 unique terms, Dragon Ball Culture is a 7 Volume analysis of your favorite series. You will go on an adventure with Son Goku, from Chapter 1 to 194 of the original Dragon Ball series, as we explore every page, every panel, and every sentence, to reveal the hidden symbolism and deeper meaning of Dragon Ball. In Volume 1 you will discover the origin of Dragon Ball. How does Akira Toriyama get his big break and become a manga author? Why does he make Dragon Ball? Where does Dragon Ball2019s culture come from? And why is it so successful? Along the way you2019ll be informed, entertained, and inspired. You will learn more about your favorite series and about yourself. Now step with me through the doorway of Dragon Ball Culture.", "industryIdentifiers": [{"type": "ISBN_13", "identifier": "9780983120575"}, {"type": "ISBN_10", "identifier": "0983120579"}], "readingModes": {"text": true, "image": true}, "pageCount": 250, "printType": "BOOK", "categories": ["Comics & Graphic Novels"], "averageRating": 5, "ratingsCount": 1, "maturityRating": "NOT_MATURE", "allowAnonLogging": true, "contentVersion": "1.11.12.0.preview.3", "panelizationSummary": {"containsEpubBubbles": false, "containsImageBubbles": false}, "imageLinks": {"smallThumbnail": "http://books.google.com/books/content?id=JYvmBQAAQBAJ&printsec=frontcover&img=1&zoom=5&edge=c thumbnail": "http://books.google.com/books/content?id=JYvmBQAAQBAJ&printsec=frontcover&img=1&zoom=5&edge=c

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but then changes its format to become the world's most recognized anime and manga series. Travel alongside Goku as he becomes the disciple of the world's greatest martial artist, meets his new training partner, and competes in the largest tournament on Earth. Will this wild monkey boy gain the discipline he needs to become the champion? Volume 3 explores Chapters 24 to 53 of the Dragon Ball manga. Let the battle begin!"

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World. Volume 5 explores Chapters 113 to 161. It's time to face your demons!", "industryIdentifiers": [{"type": "ISBN_13", "identifier": "9781943149025"}, {"type": "ISBN_10", "identifier": "194314902X"}], "readingModes": {"text": true, "image": true}, "pageCount": 194, "printType": "BOOK", "categories": ["Comics & Graphic Novels"], "maturityRating": "NOT_MATURE", "allowAnonLogging": true, "contentVersion": "1.1.2.0.preview.3", "panelizationSummary": {"containsEpubBubbles": false, "containsImageBubbles": false}, "imageLinks": {"smallThumbnail": "http://books.google.com/books/content?id=SRdSCwAAQBAJ&printsec=frontcover&img=1&zoom=5&edge=c", "thumbnail": "http://books.google.com/books/content?id=SRdSCwAAQBAJ&printsec=frontcover&img=1&zoom=5"}, "language": "en", "previewLink": "http://books.google.com/books?id=SRdSCwAAQBAJ&pg=PT228&dq=Dragon", "infoLink": "https://play.google.com/store/books/details?id=SRdSCwAAQBAJ&source=gb_api", "canonicalVolumeLink": "https://play.google.com/store/books/details?id=SRdSCwAAQBAJ", "seriesInfo": {"kind": "books#volume_series_info", "shortSeriesBookTitle": "Demons", "bookDisplayNumber": "5", "volumeSeries": [{"seriesId": "YZf3GgAAABCXjM", "seriesBookType": "COLLECTED_EDITION", "orderNumber": 5}]}, "saleInfo": {"country": "US", "saleability": "FOR_SALE", "isEbook": true, "listPrice": {"amount": 6.99, "currencyCode": "USD"}, "retailPrice": {"amount": 6.99, "currencyCode": "USD"}, "buyLink": "https://play.google.com/store/books/details?id=SRdSCwAAQBAJ&rdid=book-SRdSCwAAQBAJ&rdot=1&source=gb_api", "offers": [{"finskyOfferType": 1, "listPrice": {"amountInMicros": 6990000, "currencyCode": "USD"}, "retailPrice": {"amountInMicros": 6990000, "currencyCode": "USD"}, "giftable": true}], "accessInfo": {"country": "US", "viewability": "PARTIAL", "embeddable": true, "publicDomain": false, "textToSpeechPermission": "ALLOWED", "epub": {"isAvailable": true}, "pdf": {"isAvailable": true}, "webReaderLink": "http://play.google.com/books/reader?id=SRdSCwAAQBAJ&hl=&source=gb_api", "accessViewStatus": "SAMPLE", "quoteSharingAllowed": false}, "searchInfo": {"textSnippet": "Dragon Ball (30c930e930b430f330dc30fc30eb, 201cDoragon B014dru201d): A manga series written by Akira Toriyama from 1984 to 1995, adapted into a hit anime, video game, and merchandise franchise. The quintessential batoru manga and the world's most recognized ..."}}, {"kind": "books#volume", "id": "_3ICBwAAQBAJ", "etag": "9DQrC8y5tsc", "selfLink": "https://www.googleapis.com/books/v1/volumes/_3ICBwAAQBAJ", "volumeInfo": {"title": "Dragon Ball Culture Volume 4", "subtitle": "Westward", "authors": ["Derek Padula"], "publisher": "Derek Padula", "publishedDate": "2015-03-09", "description": "Goku goes west! His grand adventure begins anew as his martial arts master tells him to travel the world to increase his power. But what will happen when this na00efve boy enters the real world and meets people who want to harm him? Will he be able to find his grandpa's 4-Star dragon ball, or will the villainous Red Ribbon Army get to it first?! In Dragon Ball Culture Volume 4, you'll discover the origin of the Red Ribbon Army in Western cinema. You'll see how author Akira Toriyama brings Western concepts into his Eastern world and fuses them together, creating the Dragon World that we know and love. And you2019ll learn how monster movies, witches, and magical dragons mix together to tell a story about a young boy with a dream of becoming stronger. Volume 4 explores Chapters 54 to 112 of the Dragon Ball manga. So let's hop on our magic cloud and head west with Goku!", "industryIdentifiers": [{"type": "ISBN_13", "identifier": "9781943149001"}, {"type": "ISBN_10", "identifier": "1943149003"}], "readingModes": {"text": true, "image": true}, "pageCount": 283, "printType": "BOOK", "categories": ["Comics & Graphic Novels"], "maturityRating": "NOT_MATURE", "allowAnonLogging": true, "contentVersion": "1.6.4.0.preview.3", "panelizationSummary": {"containsEpubBubbles": false, "containsImageBubbles": false}, "imageLinks": {"smallThumbnail": "http://books.google.com/books/content?id=_3ICBwAAQBAJ&printsec=frontcover&img=1&zoom=5&edge=c", "thumbnail": "http://books.google.com/books/content?id=_3ICBwAAQBAJ&printsec=frontcover&img=1&zoom=5"}, "language": "en", "previewLink": "http://books.google.com/books?id=_3ICBwAAQBAJ&pg=PT340&dq=Dragon"}]

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0.9 Pieces of Data & Data Structures

The accordion-style display is created using the Bootstrap framework. In the results.html file, the accordion structure is created using the following code snippet:

```
[ ]: <div id="accordion">
  <!-- Accordion for Books -->
  <div class="card">
    ...
  </div>
  <!-- Accordion for Movies -->
  <div class="card">
    ...
  </div>
  <!-- Accordion for Articles -->
  <div class="card">
    ...
  </div>
  <!-- Accordion for Most Common Genres -->
  <div class="card">
    ...
  </div>
  <!-- Accordion for Highest Rated Books -->
  <div class="card">
    ...
  </div>
</div>
```

Each section of the accordion is contained within a

element with the class="card" attribute. Inside each card, there are two child

elements, one for the card header and one for the card body. The card header contains a link with the data-toggle="collapse" attribute, which triggers the accordion effect. The card body contains the content to be displayed when the accordion is expanded. For example, here is the code for the "Books" section:

```
[ ]: <div class="card">
    <div class="card-header">
        <a class="card-link" data-toggle="collapse" href="#collapseBooks">
            Books
        </a>
    </div>
    <div id="collapseBooks" class="collapse show" data-parent="#accordion">
        <div class="card-body">
            <ul>
                {% for book in book_list %}
                <li><a href="{ { book.url } }" target="_blank">{{ book.info() }}</a>
                {% endfor %}
            </ul>
        </div>
    </div>
</div>
```

Here, the "Books" section header is created using a link (< a > element) with the data-toggle="collapse" attribute, and the href attribute points to the ID of the collapsible content (#collapseBooks). The collapsible content is contained within a < div > element with the ID "collapseBooks" and the class="collapse show" attribute. The show class means that this section will be expanded by default when the page is loaded. The content of the "Books" section is dynamically generated using a Jinja2 template for loop.

NOTE: To see the organization and presentation of the different sections, such as Books, Movies, Articles, Most Common Genres, and Highest Rated Books please see the demo video.

0.10 Demo Video

Here is the link to the Demo Video:

<https://youtu.be/x6-qnc-nvOk>

Video Extension showing the other search filters: <https://youtu.be/TyK7pI8p5kQ>

0.11 Interaction and Presentation Options

0.12 User-facing Capabilities

Users can search for books, movies, and related articles using a query, apply filters like language, author, genre, and minimum rating, and sort the results. They can view search results, analyze the most common genres, and find the highest-rated books. The application also displays movie descriptions and news articles related to the search query.

0.13 Interactive and Presentation Technologies

- Flask: A web framework used to create the application’s frontend and backend, handling user input and displaying search results.
- Jinja2: A templating engine used in Flask to render the search results dynamically in the results.html file.
- Bootstrap: A CSS framework used to style the application, making it responsive and visually appealing. It also provides functionality for collapsible sections and navigation buttons.
- JavaScript: Used to implement interactive elements such as toggling dark mode functionality.
- Python: Used to handle the backend processing, including searching for books, movies, and related articles, creating the genre graph, and applying filters to the results.

0.14 Instructions for User Interaction

After submitting the search query from the index.html page, the user will be redirected to the search results page (results.html).

1. On the search results page, the user can view the results organized into collapsible sections: Books, Movies, Articles, Most Common Genres, and Highest Rated Books.
2. Users can click on the section headers to expand or collapse the content within each section.
3. Click on the URLs provided to access more information about the items displayed.
4. Users can navigate through the search results using the “Previous” and “Next” buttons at the bottom of the page.
5. To start a new search, users can click the “Start New Search” button, which will redirect them back to the index.html page.