CS 410 - Group Project Fall 2023

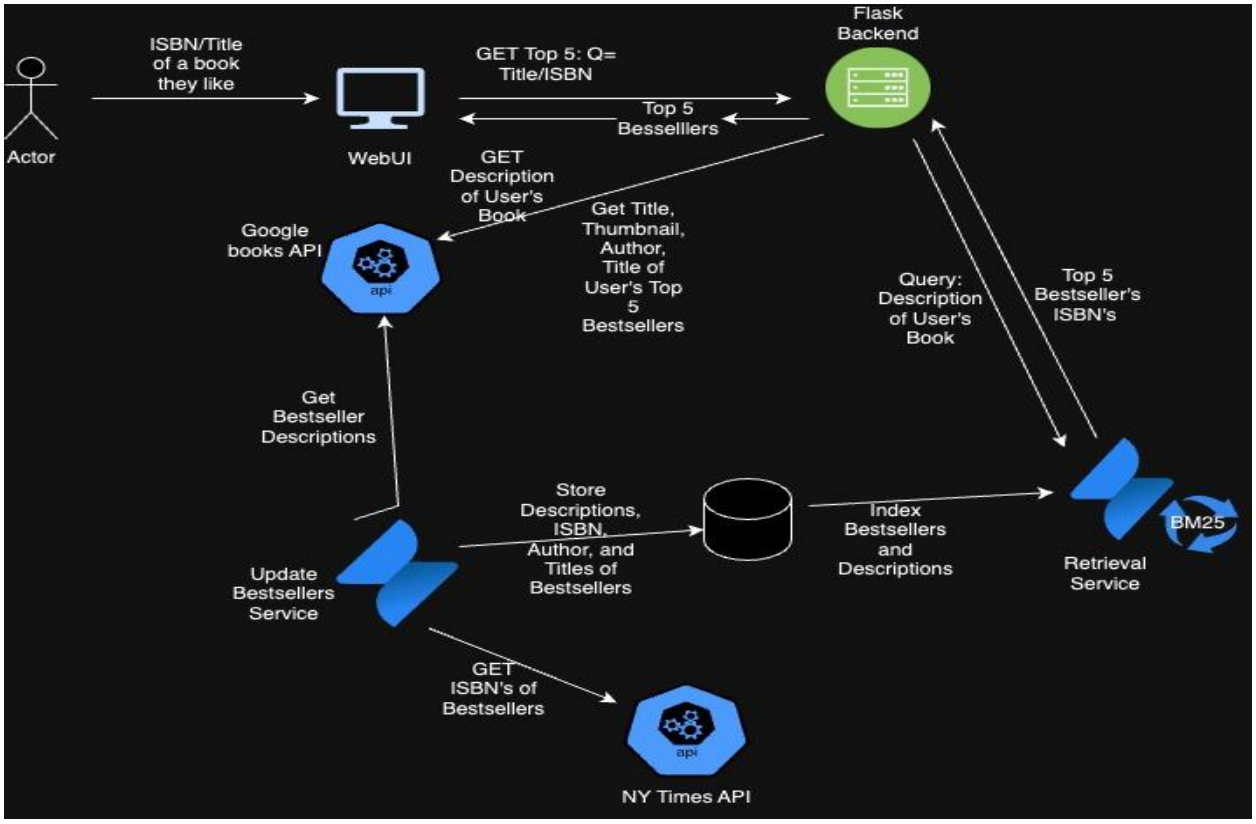
Team: EMKW

Overview of Code Function

The purpose of this code is to take an input of a book that the user is interested in and return a ranked list of 5 books on the current New York Times BestSeller List that are similar to that book. It is intended for use by those who want to find their next book to read and want something that is well liked and easy to find in a bookstore as most New York Times BestSeller books are.

Software Methodology

Design Diagram



The diagram above shows the Design Diagram for this software. The user will input the ISBN or Title of a book that they like into the Web User Interface(UI). The Web UI will then reach to the Flask Backend which gets a description of the book from the Google Books API and will reach to the Retrieval Service that ranks the books returned from the Update BestSellersService which is run separately prior to launching the WebUI currently. The Update BestSellers Service reaches out to the New York Times Books

API when it is run to get a list of all books currently on the New York Times BestSeller List (approximately 230 books).

Software Use

Usage of APIs and Functions:

1. *Django WebApp*
    - We chose to use this framework since it runs on python and we could easily apply the functions that we have used in the MPs to the project. We later changed to flask.

2. *Flask Webapp*
    - The flask webapp holds our backend and calls the google api and calls the retrieval service which is the communication connection between our bestsellers service. It also holds the frontend where a user can go to their local port and enter a book title or isbn.

3. *New York Times API*
    - We chose to use this API to get a list of popular books to recommend to readers.
    - Requires an API key that can be obtained through creating an account with NYT (https://developer.nytimes.com/get-started) and adding it to the config.py file. Only the Books API needs to be enabled for the key to work for this project.

4. *Google Books API*
    - We chose to use this API to get additional information about books that the user can search for because it does not require additional API Keys, it is free to use, and it contains all the necessary information to run this application, including title, ISBN, description, and book cover image.

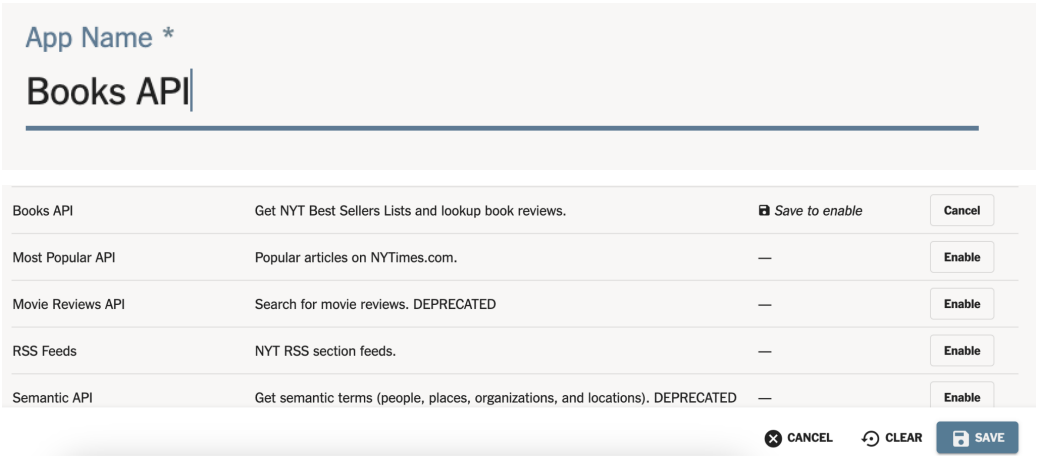
5. *NLTK Function*
    - We used this function for preprocessing book descriptions, involving:
        a. Converting words to lowercase
        b. Removing punctuations
        c. Removing stop words
        d. Lemmatizing words
        e. Stemming words

6. *Inverted Index Function*
    - We initially considered utilizing the MetaPy Inverted Index to efficiently index book descriptions. However, we did not proceed with its implementation due to challenges encountered in integrating the inverted index with ranking functions using the MetaPy library.

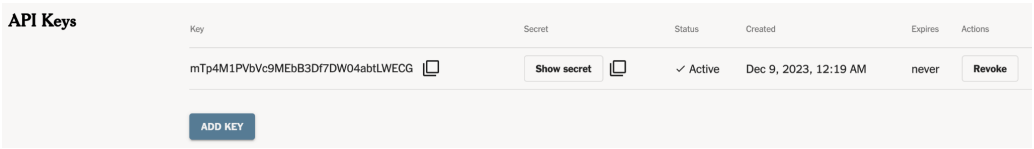
7. *BM25 Function*
    - We used this function to rank the books in the New York Times bestseller list based on similarity to the description of any book from user input.

How to use this application:

1. Create an API key from New York Times
    a. Create an account at https://developer.nytimes.com/accounts/create.
    b. Once you verified your email and logged into your account, head to https://developer.nytimes.com/my-apps to create a new app.
    c. Set an 'App Name', enable 'Books API', and click 'Save'.

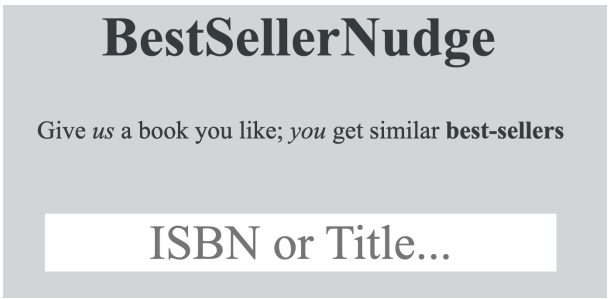


    d. Once saved, your API key should be available, save it as it will be used later.



2. Instructions for MacOS
    a. Open Terminal
    b. Change directory to Documents folder
        i. cd Documents
    c. Clone GitHub Repo into your Documents folder
        i. git clone https://github.com/emilynmeyer/EMKW/
    d. Change directory to EMKW folder
        i. cd EMKW
    e. Create a virtual environment
        i. python -m venv venv
    f. Activate the virtual environment
        i. source venv/bin/activate
    g. Change directory to BestSellerNudge folder
        i. cd BestSellerNudge
    h. Install python dependencies
        i. pip install -r requirements.txt
    i. Edit config.py file
        i. vi config.py
        ii. Click on ‘I’ to enter insert mode
        iii. Update ‘YOUR_API_KEY’ to the API key generated in step one
        iv. Click on ‘ESC’ to exit insert mode
        v. Type ‘:wq’, then enter to exit and save the file
    j. Run update_bestsellers code to obtain most recent NYT best sellers list
        i. python update_bestsellers.py
    k. Run app code to start the server for BestSellerNudge application
        i. python app.py
        ii. Once the code executed successfully, look for the link generated from the log

```
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5000
```

    l. Copy and link from above and paste it in your internet browser to launch the application
        i. 

        ii. Enter the title or ISBN of a book to discover other NYT bestsellers that share similarities with the selected book.

3. Instructions for Windows
    a. Open Terminal
    b. Change directory to Documents folder
        i. cd Documents
    c. Clone GitHub Repo into your Documents folder
        i. git clone https://github.com/emilynmeyer/EMKW/
    d. Change directory to EMKW folder
        i. cd EMKW
    e. Create a virtual environment
        i. python -m venv venv
    f. Activate the virtual environment
        i. source venv\Scripts\activate
    g. Change directory to BestSellerNudge folder
        i. cd BestSellerNudge
    h. Install python dependencies
        i. pip install -r requirements.txt
    i. Edit config.py file
        i. notepad config.py
        ii. Update 'YOUR_API_KEY' to the API key generated in step one
        iii. ctrl s
        iv. Exit the notepad file
    j. Run update_bestsellers code to obtain most recent NYT best sellers list
        i. python update_bestsellers.py
    k. Run app code to start the server for BestSellerNudge application
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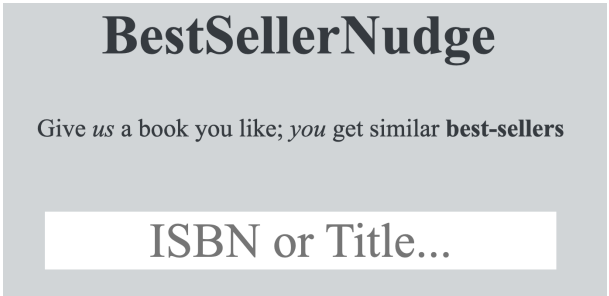
        i.



        ii. Enter the title or ISBN of a book to discover other NYT bestsellers that share similarities with the selected book.

Team Member Contributions

Table of the contributions from each team member.

Tasks	Time (hours)	Responsible	Language
Get information from Best Seller List	**10**		
Extract information from NYT API		Emily Meyer	Python (pass JSON)
Formatting Information once extracted		Emily Meyer	Python
Get description information from Google Books	**15**		
Write a function to return a description from Google Books		Emily Meyer	Python (pass JSON)
Preprocess descriptions pulled from Google Books		Kin Yik Lam	Python
Creation of Inverted Index	**10**		
Code Inverted Index algorithm function		Kin Yik Lam	Python
Store inverted index per book for ranking		Kin Yik Lam	Python
Ranking Algorithm Implementation	**10**		
Code the BM25 Function		Kin Yik Lam	Python
Implementing the function on an imported list		Warren Dietz	Python
Back End	**10**		
Exporting the results to the Results Table		Warren Dietz	Python (pass JSON)
Create Endpoints		Warren Dietz	Python
User Interface	**25**		
Set up Framework		Mark Falcone	HTML/CSS/Javascript
Write Instructions for User		Warren Dietz	HTML/CSS/Javascript
Implement Search Bar (search google books)		Mark Falcone	HTML/CSS/Javascript
Include drop down to pick from books?		Mark Falcone	HTML/CSS/Javascript
Implement Table with Results (ranked NYT list)		Warren Dietz	HTML/CSS/Javascript