Team MPDL Final Project Proposal: CS410 – Fall 2022

11/14/2022

Names, NetIDs, Captain

Team MPDL consists of the following members (NetID): Michaela Horn (mmhorn2), Peter Jefferson (peterwj2), Da'Mon Morris (dmorri25), and Lookman Olowo (lolowo2). The captain of the team is Peter Jefferson (peterwj2).

Which Tasks Have Been Completed?

Since our project proposal, our team has held a few meetings and accomplished some of the main tasks for the project. First, we created a Twitter account and configured the account to utilize the Twitter API. We wrote a Python script to interface with the Twitter API that returns tweets for a given query.

We also implemented Flask microframework in our project and built a simple search engine page as well as a results page.
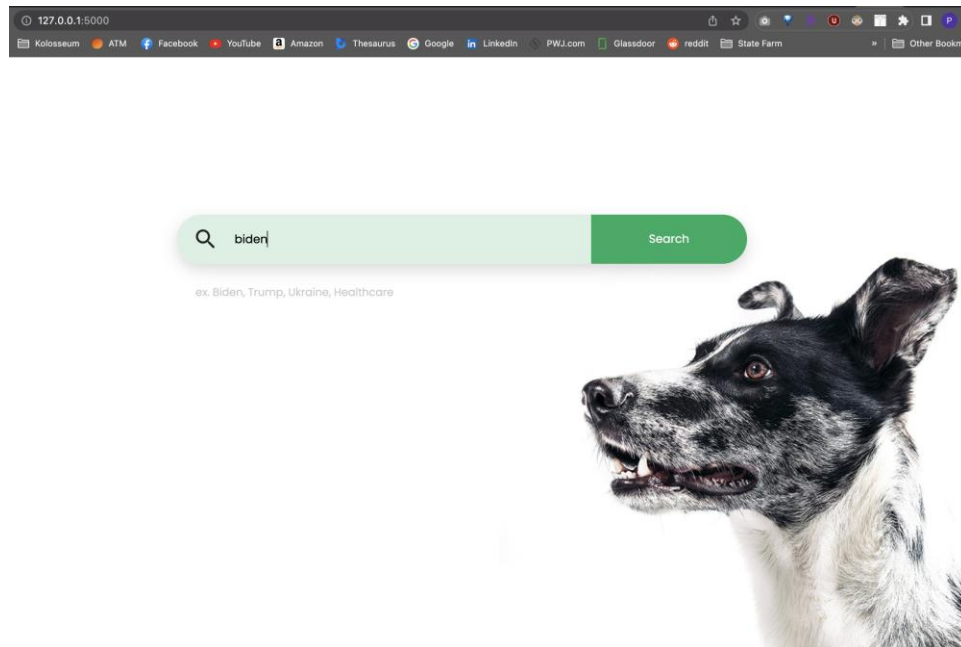
Behind the user interface is the REST API service ("The API") of our application. The API includes a Twitter Client class written by our team which is leveraged by our user interface to query the Twitter API. A list of prominent news sources and their Twitter usernames are consolidated within the API. Each news source's ID is paired with the user-provided query datum to compose the query data. When sending a request to the Twitter API, the query data are included as arguments. The response from the Twitter API is sent to our sentiment analysis function. The sentiment analysis function implements the TextBlob python package and returns a sentiment of *positive*, *negative*, or *neutral*. Each tweet is

appended to a dictionary along with the sentiment and the news source. The API returns a list of all the tweets sorted by news source. See the images below to observe the consistency between the API and the live twitter website.
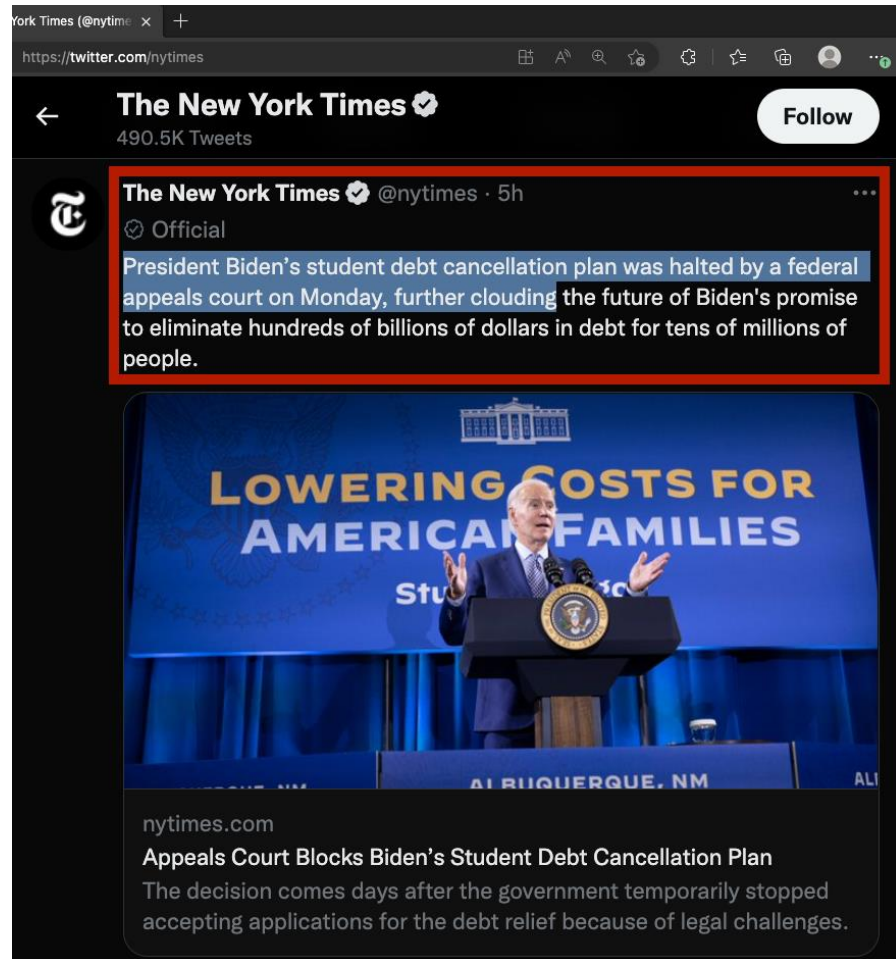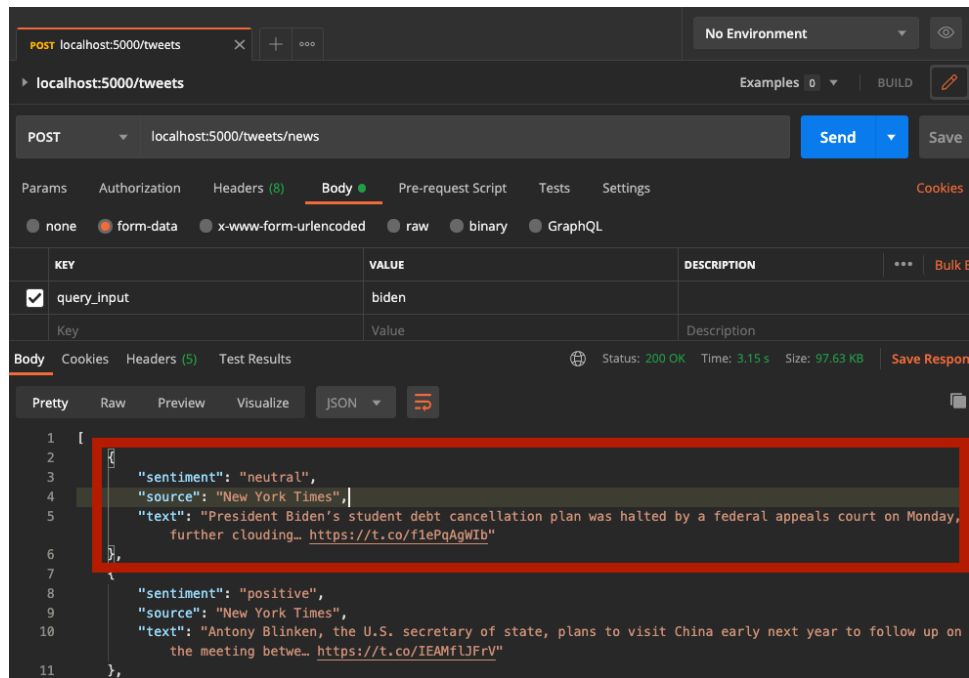
We then linked the back-end and front-end so that when a user inputs a query and clicks "Search" it takes them to the results page and displays the results as well as each tweet's sentiment.

RESULTS PAGE

Tweet	Sentiment
President Biden's student debt cancellation plan was halted by a federal appeals court on Monday, further clouding… https://t.co/f1ePqAgWIb	neutral
Antony Blinken, the U.S. secretary of state, plans to visit China early next year to follow up on the meeting betwe… https://t.co/IEAMflJFrV	positive
"I do not think there's an imminent attempt on the part of China to invade Taiwan," President Biden said at a news… https://t.co/5qzvBABZ9z	neutral
President Biden and President Xi Jinping, leaders of the two biggest emitters of greenhouse gases, agreed to restar… https://t.co/uEE0VtOmjF	neutral
Breaking News: President Biden and his Chinese counterpart, Xi Jinping, signaled an openness to repairing bilateral… https://t.co/pKsnr0ONGP	neutral
President Biden and his Chinese counterpart, Xi Jinping, will hold a face-to-face meeting in Bali. The talks comes… https://t.co/BSIunjMHCj	neutral
President Biden feels buoyant after the better-than-expected midterms. But as he nears his 80th birthday, he confro… https://t.co/1lQd6KqPDK	positive
By holding their Senate control, even with a bare-minimum majority, Democrats have preserved their ability to confi… https://t.co/STdJ8vQdC3	positive
In Opinion President Biden's first two years in office did not bring unity "because the goal of national unity was… https://t.co/esh5pd8yBt	positive
Did John Fetterman show Democrats how to solve their white-working-class problem? His victory in Pennsylvania's Sen… https://t.co/5ovli0txUB	neutral
The individual showings of Senate candidates across the U.S. varied widely in the midterms. Some Democrats and Repu… https://t.co/3kq0cF2s9M	negative
President Biden trod a well-worn presidential path by going abroad on official functions just after the midterms. B… https://t.co/ctYp7tjisr	neutral
RT @katierogers: NEW: "We've seen the affirmation of the president's agenda, vindication of his message, and rejection of so many election…	positive
President Biden told Association of Southeast Asian Nations members that the U.S. was committed to deepening "peace… https://t.co/55LRihzm7K	neutral
President Biden's meeting on Monday with his Chinese counterpart, Xi Jinping — their first in person since Biden to… https://t.co/kebGMWiw36	positive
OPINION: Joe Biden's spending blitz keeps setting records and he's not even halfway through his presidency https://t.co/INlb5ONkTF	neutral
Biden's China diplomacy is 'strategic insanity' with real-world repercussions: Thiessen https://t.co/3DNXW6RRgM	positive
Judge says FBI agent can be deposed for allegedly working with Meta to bury Hunter Biden laptop story https://t.co/3TSmsI7I2d	negative
Biden student debt relief handout blocked by federal appeals court https://t.co/W6lKPc4D08	neutral
'Don't Run Joe': Progressive group gathers petition signatures urging Biden not to seek re-election https://t.co/hKmTLZuD1D	neutral
Jen Psaki posts odd defense of Biden running in 2024 despite advanced age: 'You know Trump is 76, right?' https://t.co/zvumdserj0	positive
Biden called out for failing to bring up COVID with China's Xi: 'Stand up for families' https://t.co/3yG7ppYzGe	neutral
Twitter 'trust and safety' head who resigned post-election played role in censoring Hunter Biden laptop story https://t.co/AathCbQjWv	neutral
Biden's failed border policies forced Arizona to build container wall, Yuma county says https://t.co/JJDwxo0JPh	negative
Biden official mocks 'oppression' voiced by 'White protesters' against lockdowns, shares defense of BLM riots https://t.co/LSSrbdryKR	neutral
Biden admits Democrats won't be able to codify Roe v. Wade: 'I don't think there's enough votes' https://t.co/NsrWPxRrmc	positive
Biden says after Xi meeting he doesn't believe there is 'imminent attempt' from China to invade Taiwan https://t.co/g8hYUvRXn9	neutral
Biden-Xi meeting did not mention COVID-19 pandemic, according to White House https://t.co/9XK3Es3Wsi	neutral
Biden quickly regrets making news on abortion at press conference: 'I shouldn't have answered your question' https://t.co/COHyYZvmYi	negative

Lastly, we have been researching and redesigning portions of our projects in response to some of the feedback we received. We are adding more material from the course as a TA suggested. To do this we will not only be performing a sentiment analysis on the tweets, but also utilizing topic modeling to suggest to the user related "trending" topics to search once they have used the search engine at least once. Please see below for the process diagram for the process. The green boxes represent parts of the process that we have implemented successfully.
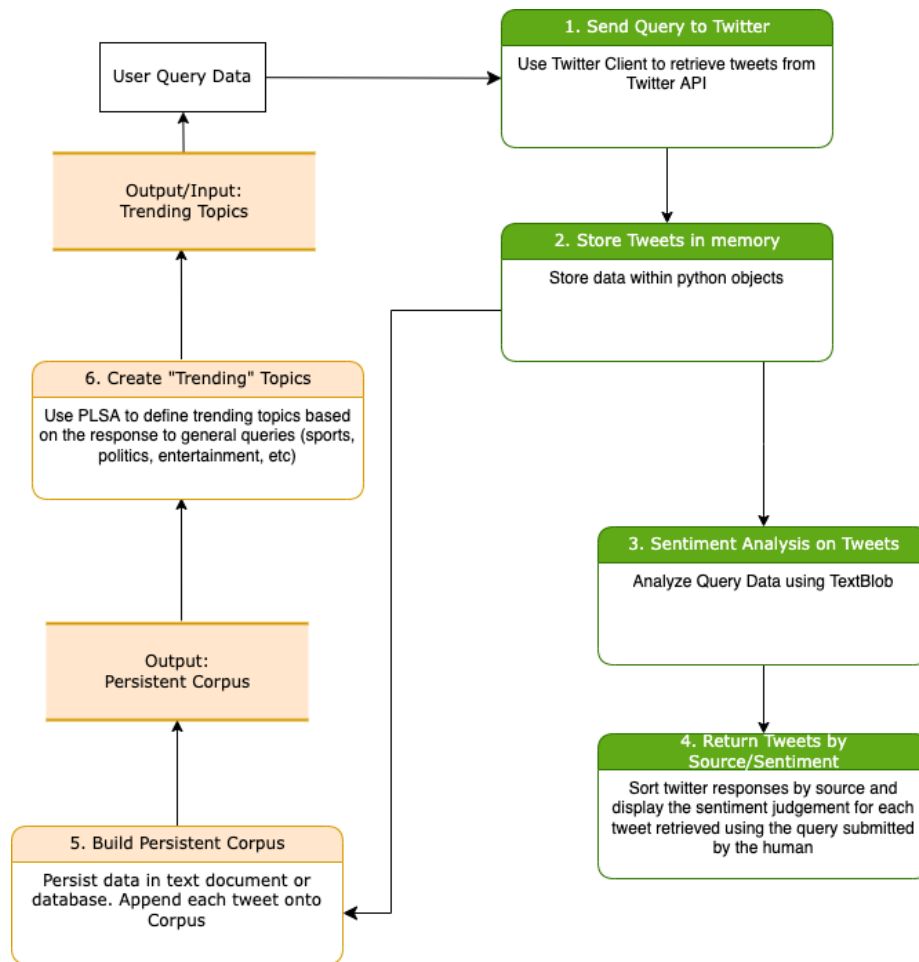
Which Tasks Are Pending?

We have steps 5 and 6 of the above process to complete (represented by the orange boxes). First, we need to decide on how we will persist the corpus as well as the user's queries so that we can suggest trending topics related to their queries (and to ensure that the trending topics are not their queries exactly). Next, we need to implement a topic modeling algorithm within the API. We also need to write a couple of functions to clean, prepare, and return the queried tweets in a structured manner so that they do not have emojis, special characters, and are formatted as a 'document' in our returned results.

After, we also need to design the front-end to display the results cleaner, offer a filtering or ranking option, and make the tweets clickable. We will also need to include the options to filter a query by certain Twitter news pages if the user only wants to see results from certain news sources. This will most likely be accomplished via the use of HTML check boxes.

Lastly, we will also need to make the application more resilient to handle errors, null entries, and other bugs. We then will need to test the app by reading articles/tweets that are returned

for a query, deciding what our sentiment is on the article/tweet and comparing it to what the application returned.

Are you Facing any Challenges?

So far, we have only had a couple of challenges. The first being everyone's schedule lining up for the past couple of weeks; everyone has been very busy. We also still need to figure out how to implement the topic modeling algorithms into our application for our use case. We have been looking at past lectures and MPs to figure out how to best approach implementation of the topic modeling portion into our application.

In addition, we need to implement a way to save user's queries so that we can use them to suggest other trending topics to search. We plan on using a local CSV file for this, but we may need to move to something more resilient like a database.

We are all also new to Flask, so we have been slowly coming up to speed on how to properly use the framework, and how to communicate between the API and user interface.