



TCSS 445: Final Report

Group Name: Tweetrumper

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Abstract

Tweetrumper App is a joint JavaScript-Python technology that crawls the 2020 election candidates' and the President of United States' Twitter accounts timelines and collects tweets, uses regular expressions to determine keywords, then commits them to a database for searching. The front-end of the applications utilizes serverless commands to organize, aggregate, and display the data from the database on the web browser. The Tweetrumper App is a program that aids user decisions in elections by enabling viewership of tweets related to keywords.

Introduction

The Tweetrumper application, at its core, is a program that searches for Twitter data on all Democratic nominee hopefuls' and the current President's latest tweets as they race for the Democratic Convention Nomination and the 2020 Presidential election. The data will highlight key or core issues in society linked with every Tweet. The program will expose those who are concerned with the issues at hand and to what extent they express this for several categories such as: economy, debt, workers, and health care. These are seen as issues that people care for, that people work for, and what people vote for and they have significant influence on the outcome of the election.

Objectives and Scope

The original goal in the proposed project was to expose or bring to light the manner of President Donald J. Trump's Twitter feed and his views on the topics listed above. However, that viewpoint has expanded as well as the scope of the project linearly. The Tweetrumper application now keeps track of all the candidates involved with the election since late January 2020, before the Democratic National Party's nomination process began in full swing. These candidates include: President Donald J. Trump, Sen. Bernie Sanders, Sen. Elizabeth Warren, Sen. Joe Biden, Sen. Amy Klobuchar, Rep. Tulsi Gabbard, Gov. Pete Buttigieg, Former Mayor Mike Bloomberg, Andrew Yang, and Tom Steyer. This expansion was from notions taught in TCSS 325, Ethics, that the program must be closer to an unbiased form or there will be inconsistencies in its usage. The objective of the program is to enlighten users on viewpoints made by candidates. If the program narrows the scope to one candidate, then viewership of the content will consist of trivial users who only seek a single source of data. The mandate of the program is to broaden each user's view on each topic and to spread knowledge of what each candidate has to bring to the election table.

Existing Solutions

An existing solution is called Trump Twitter Archive which shows all of Trump's tweets based on popular keywords that users might search for as well as a search engine that enables users to find all tweets by use of a search bar. This archive of data does not work in a relational data method because entered keywords do not specifically target the target topics that the Tweetrumper application does target. While their search feature allows for a broader viewset, the data is not presented in a manner that could be organized to the user's interests. However, the Tweetrumper application should define a relationship such that while each keyword can be found in multiple tweets, we want to actually narrow the search down, so

it accounts for a keyword in every message matching topics that show consistently in candidate debates. Essentially, the application should present the information in a faster and more concise way than what Trump Twitter Archive aims to accomplish.

Another difference is that the scope of our project has increased. Trump Twitter Archive only keeps track of the tweets from President Donald J. Trump. While the website still provides information, the Tweetrumper application cannot accept a closed-world view of only having a single political figure as its featureset. Tweetrumper keeps record of all candidates (who are in the best stature for acquiring delegates) and reports their tweets from their timeline. This is an expanded view and truly sets the two applications apart.

Architecture & Design Overview

The Tweetrumper application utilizes serverless functions to call the database for information to display on the front end. To begin an overview of the design, the numerous technologies that the application uses will be stated. The program uses the following set of languages: HTML, CSS, JavaScript, and Python. The accompanying frameworks and libraries aids the application: Node.js, Next.js, React, and Tweepy (Twitter's REST API). The primary DBMS used is MariaDB (a fork of MySQL).

The Node.js, Next.js, and React half of Tweetrumper comprises the "front-end" of the program. React is a javascript library that allows for easy creation of web applications. Next.js is a framework for React that handles many necessary functions such as file-system routing and server side rendering [1]. Next.js uses Node.js for server-side rendering of the website and database connectivity. Next.js also allows for easy creation of serverless API functions to handle the fetching of data from an external source, such as our SQL server. Although we run these functions on the same server as the web application, it would be possible to export them to run on the cloud, along with our database.

The other half of the application utilizes the Tweepy library in a Python program called "candidate_reader.py" or the Candidate Reader. The Tweepy library is a REST API created by Twitter, Inc. that allows usage of their read and write functionalities in regards to their data sets on their respectively-named website. The Tweetrumper application uses the read-only functionality of the API, where Twitter handles of candidates (their username followed by the '@' on the website) are the primary key to access data objects it returns known as "Status". Status objects are packaged JSON files that contain bundled user information.

Candidate Reader first makes a connection to the database and sets up a command cursor pointing to the database. This allows Candidate Reader to use prepared SQL queries on the database without producing a .sql extension file. Then, the program employs a query on each candidate's Twitter timeline tweets and retrieves Status objects at a set number (200~1000), starting from the top. Every Status object has an identifier called "full_text" or the entire text of the tweet. The program scans every text string extracted in this manner and compares it against a list of keywords using regular expressions. The keywords are subjects pertinent to the presidential election and include terms like "economy" and "health care".

Every text string, the keyword, the tweet identifier, and the user identifier are bundled into a list of dictionary items. After collecting these assets for each candidate, the program shifts to building the database if it does not exist, if it doesn't it builds it then builds the relational tables: candidates, handles, tweets, and tweet_content. These dictionary items are then written line by line to the database using prepared statements, statements that come in the format of "INSERT INTO candidates VALUES (%s, %s, %s, %s)" where "%s" are the values in the dictionary being retrieved and written. After all writes are committed to the database, the program exits. This procedure is required for populating the database with a dataset vital to the program's view.

Results & Analysis

The Tweetrumper application succinctly does its goal where it enables the user to search for topics like "gun violence" and "economy", then assess the contents of every tweet within the top 200 to 1000 posts of each candidate. Some candidates focus on different topics more than others like Bernie Sanders has talked about the "workers" the most, but in another area, Tom Steyer focuses on the economy. The most surprising of filtering through all these search results is the booming silence the President remains to these topics. One of the queries is able to determine the "strength of concern" in for every keyword input where it shows the count of posts each candidate has made with a given topic and President Trump hardly appears on every keyword. Results where there is reoccurring silence are alarming in this kind of program, because the program truly showcases how polarizing the candidates are or the President.

Conclusion

The Tweetrumper application allows users to gain a view on how candidates are effectively using social media today to express their mantra. The program gauges the strength of that mantra and displays it to the users in a fashion they can assess and make sound decisions as they hopefully hit the ballot box in the upcoming 2020 primaries and elections. The purpose of Tweetrumper is that most people follow few candidates and their interests can get pulled into a filter bubble (another topic worthy of another paper) where their worldview is closed even though social media has connected society more than ever before. There is hope that the application can influence people to make clear judgements and know what their voting for and what they're getting as a result in the upcoming elections.

Future Work

The Tweetrumper application has room to grow in many areas of design and implementation. Amongst the list of them are the following: transform the application into a progressive web application via the Google guidelines otherwise known as Google Lighthouse[2] and allowing the program to live update/schedule updating tweets. These improvements stand out the most, but there can be others.

Upgrading to a progressive web application (PWA) is an undertaking that is often unseen. A progressive web app is an installable program that is to look and feel like an app that you get from the mobile ecosystem [3] or installed on the desktop. The program must be reliable and fast, including during and after initial setup. A PWA employs several units (at least one) called service workers [3]. These

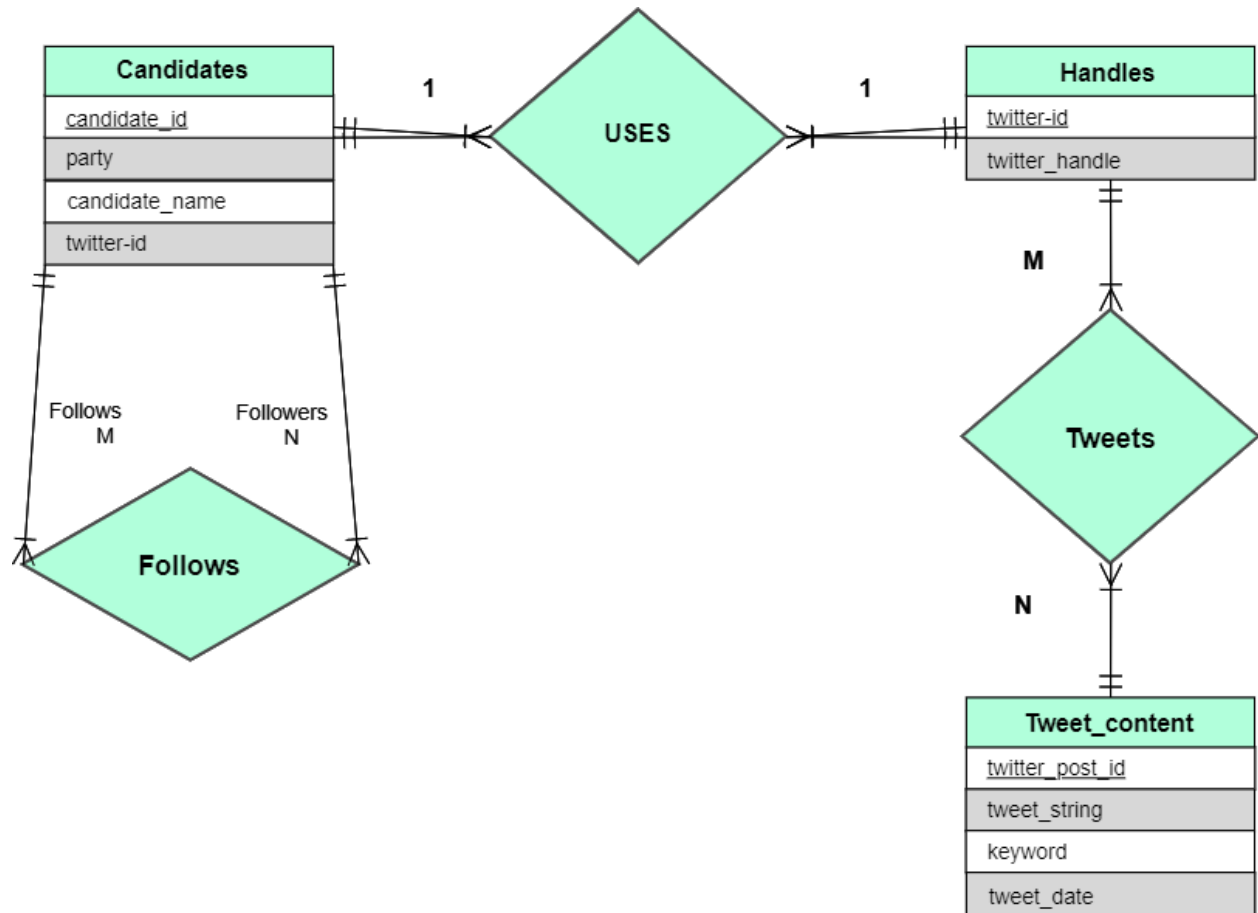
service workers ensure that state is not lost if the user pans away from the application. The workers also aid against application crashes by acting as threads for the program, so if one goes down, another service worker comes online. Along with service workers is an integrated cache that self-manages itself [3]. The cache ensures browsed data retention and data remains durable throughout application use, even in offline use. A project like Tweetrumper should accept the mandates of these capabilities because the application is light and should be portable. Once these improvements are in place, it will be more accessible than apps from ecosystems as it's obtained from the browser.

Another improvement would be to allow live-scheduled or scheduled Twitter updates from the candidates, where Tweet updates from candidates are retroactive. An idea that falls synonymous in that regard is having updated candidate statuses when the candidate postpones or drops out of running. Scheduled updates would ensure data integrity and reliability. Currently the database is either in a “static” state of the last snapshot from a Twitter data pull or in a new state from the latest data pull. Neither of these suffice in complete design and breaks the good will of having a database. A secondary live-update condition is to report the status of running candidates in real time. Candidates can drop out of the running or come in at any time, however, it must be limited by a forecast of success.

References

- [1] “Next.js.” *Learn - Getting Started / Next.js*, Feb. 2020, nextjs.org/learn/basics/getting-started.
- [2] “Lighthouse | Tools for Web Developers | Google Developers.” Google, Google, 2020, developers.google.com/web/tools/lighthouse.
- [3] Richard, Sam, and Pete LePage. “Progressive Web Apps.” Web.dev, Google Developers, 2020, web.dev/progressive-web-apps/.

Appendix A: E-R Diagram



Appendix B: Normalization Proof to BCNF

For the candidates relation, the following functional dependencies are outlined:

Fd.1 $\text{candidate_id} \rightarrow \{\text{candidate_name}, \text{party}, \text{twitter_id}\}$
Fd.2 $\{\text{candidate_id}, \text{candidate_name}\} \rightarrow \{\text{party}, \text{twitter_id}\}$
Fd.3 $\{\text{candidate_id}, \text{candidate_name}, \text{party}\} \rightarrow \text{twitter_id}$
Fd.4 $\{\text{candidate_id}, \text{twitter_id}\} \rightarrow \{\text{candidate_name}, \text{party}\}$

Since the determinant Fd.1 is a proper subset of the determinants in Fd.2 and Fd.3 and Fd.1 covers all relational attributes, Fd.2 and Fd.3 cannot be considered candidate keys, hence cannot be considered primary keys for BCNF. Fd.1 and Fd.4 are the remaining candidate keys, but since we seek a minimal superkey, Fd.1 has the least number of attributes that satisfy all columns, therefore qualifies for primary key. Nonetheless, the determinant of Fd.1 is also a proper subset of the determinant of Fd.4, hence Fd.1 is the remaining candidate key. Since one candidate key is a determinant of all columns in the candidates relation, candidates is proven BCNF.

For the handles relation, the following function dependencies are provided below:

Fd.1 $\text{twitter_id} \rightarrow \text{twitter_handle}$

Since the determinant of Fd.1 is a minimal superkey and is the only candidate key for the handles relation, handles is proven BCNF.

For the tweets relation, the following functional dependencies are outlined:

Fd.1 $\text{twitter_id} \rightarrow \text{twitter_post_id}$

Since the determinant of Fd.1 is a minimal superkey and is the only candidate key for the tweets relation, tweets is proven BCNF.

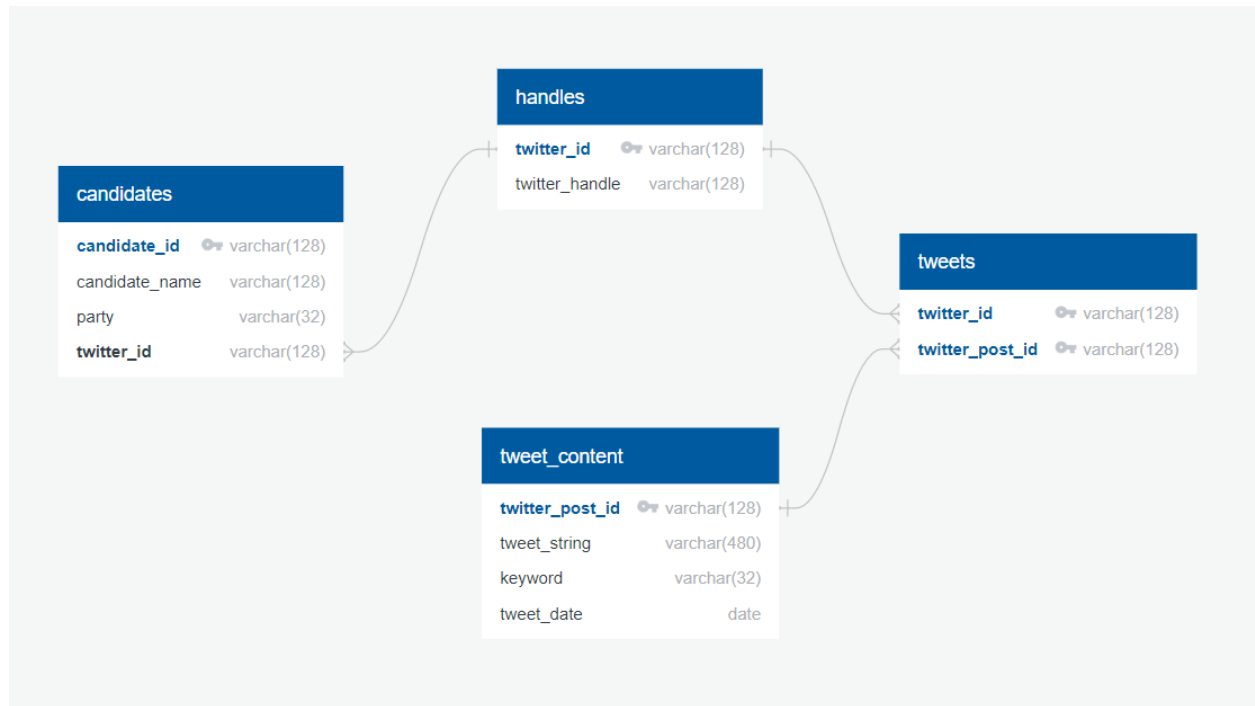
Lastly, for the tweet_content relation, the following function dependencies are stated:

Fd.1 $\text{twitter_post_id} \rightarrow \{\text{tweet_string}, \text{keyword}, \text{tweet_date}\}$
Fd.2 $\{\text{twitter_post_id}, \text{tweet_string}\} \rightarrow \{\text{keyword}, \text{tweet_date}\}$
Fd.3 $\{\text{twitter_post_id}, \text{keyword}, \text{tweet_string}\} \rightarrow \text{tweet_date}$
Fd.4 $\{\text{tweet_string}, \text{keyword}\} \rightarrow \text{tweet_date}$
Fd.5 $\text{keyword} \rightarrow \text{tweet_date}$

Since the determinant of Fd. 1 is a proper subset of the determinants of Fd.2 and Fd.3, and Fd.1 covers all relational attributes uniquely, then the determinants of Fd.2 and Fd.3 cannot be candidate keys. Fd.4 and Fd.5 do not map to both `twitter_post_id` and hence cannot be a super key of the relation, so consequently

cannot be a candidate key for the relationship as well. This leaves the determinant of Fd.1 to be the only remaining candidate key and the only remaining minimal superkey. Since it is the only determinant of that nature for the relation, tweet_content is proven BCNF.

Appendix C: Relational Schema Diagram

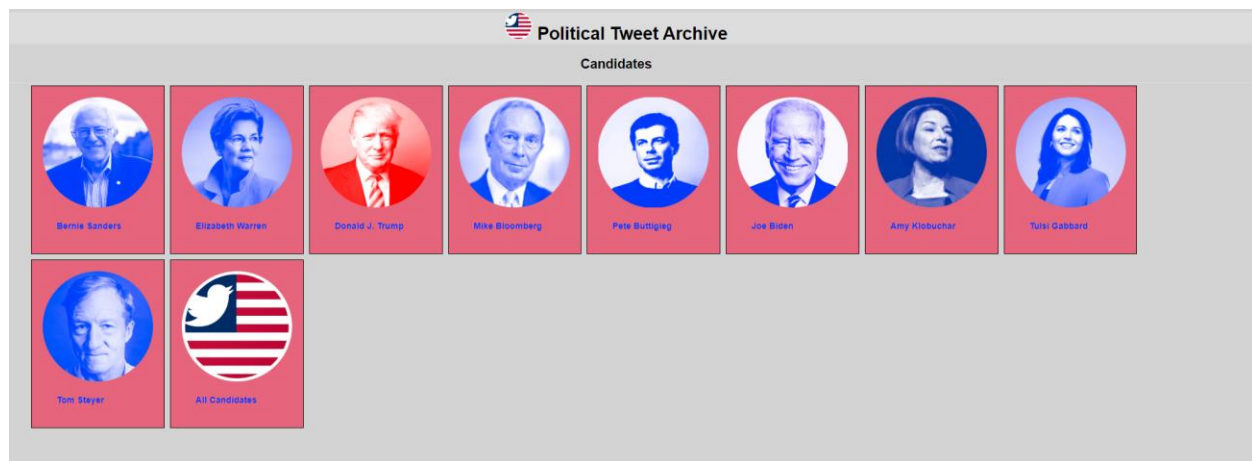


Appendix D: Functional SQL Queries (pictures and description for each)

Query 1: Selects all entries from the table of candidates and orders by the unique candidate ID.

```
module.exports = async (req, res) => {  
  const tweets = await db.query(escape`  
    SELECT *  
    FROM candidates  
    ORDER BY candidate_id  
  `);  
  res.status(200).json({ tweets })  
}
```

Result:



Query 2: Selects the candidate name, keyword, tweet date, and content of tweets made by all candidates that contain a certain keyword in the tweet body, ordered by candidate name.

```
const allTweets = await db.query(escape`  
  SELECT C.candidate_name AS "name",  
         TC.keyword       AS "keyword",  
         TC.tweet_date    AS "tweet_date",  
         TC.tweet_string  AS "content"  
  FROM candidates AS C  
       JOIN tweets AS T  
         ON C.twitter_id = T.twitter_id  
       JOIN tweet_content AS TC  
         ON T.twitter_post_id = TC.twitter_post_id  
  WHERE keyword = ${req.query.keyword}  
  ORDER BY C.candidate_name  
`);
```

Result:



Tweets from All Candidates


Search for a Keyword:

Candidate Name	Keyword	Tweet Date	Post Content
Amy Klobuchar	workers	2020-02-16T08:00:00.000Z	Unions help all workers fight for better wages and workplaces. America needs more unions—not fewer. I'm the granddaughter of a miner and the daughter of a union teacher and union newspaperman. I will always defend the right to organize.
Amy Klobuchar	workers	2020-02-18T08:00:00.000Z	Nevada: If you're ready to make childcare and long-term care more affordable, If you're ready to take on Big Pharma and stand up for workers' rights, join our campaign. We can do this. https://t.co/4q3egltSgn https://t.co/1zNF127Oyx
Amy Klobuchar	workers	2020-02-19T08:00:00.000Z	I stand in solidarity with the Station Casinos workers fighting for a fair contract in Las Vegas at The Palms. When unions are strong, America is strong. I will continue to fight for workers' rights alongside @culinary226, @teamsters, and everyone united in this effort. https://t.co/0E8SKo2kKW
Amy Klobuchar	workers	2020-02-22T08:00:00.000Z	Visited with @Culinary226 workers at Mandalay Bay here in Las Vegas this morning! Culinary has helped over 18,000 immigrants become American citizens. Their work is remarkable and what the American Dream is all about. https://t.co/At25iZwyB
Bernie Sanders	workers	2020-02-24T08:00:00.000Z	I stand with Denver airport workers who organized with @SEIU. Workers stood together, won raises, and voted to join @SEIU105. I hope to see @United honor their choice. https://t.co/5tAvEixrJo
Bernie Sanders	workers	2020-02-24T08:00:00.000Z	We do not need a nominee who profits from private equity vultures and the destruction of the planet. We need someone who is willing to stand up for workers and will stop the greed of the fossil fuel industry. Unlike Mr. Bloomberg, as president, that's exactly what I will do. https://t.co/Qsz8gRAxZ8
Bernie Sanders	workers	2020-02-29T08:00:00.000Z	This is disgraceful. All workers deserve the right to bargain and strike for better wages and benefits. To Janet Napolitano and @UCSC: stop this outrageous union busting and negotiate in good faith. https://t.co/oaQGTOvOdW
Elizabeth Warren	workers	2020-02-19T08:00:00.000Z	More than half of hourly workers get their schedules with less than a week's notice & hours can fluctuate 40-70% each month. That makes it nearly impossible to go to school, get child care, & pay the bills. That's why @RosaDeLauro & I have the #SchedulesThatWork Act. https://t.co/cwFiWHzv8Z
Elizabeth Warren	workers	2020-02-19T08:00:00.000Z	My #SchedulesThatWork Act would set some ground rules for retail, fast food, & other hourly workers' schedules: ❌ Workers should get their schedule 2 weeks in advance ❌ No retaliation for requesting schedule changes ❌ Workers have a right to rest between shifts
Elizabeth Warren	workers	2020-02-20T08:00:00.000Z	2/3 of part-time retail workers want full-time work, but corporations keep them part-time to skimp on wages & benefits. My Part-Time Worker Bill of Rights would make big companies offer available hrs to their part-time workers before hiring new employees. https://t.co/CAzXuZMST7

Query 3: Selects all tweets from a certain candidate that contain a certain keyword, ordered by tweet date.

```
const candidates_info = await db.query(escape`
  SELECT *
  FROM tweet_content
  JOIN tweets
  ON tweet_content.twitter_post_id = tweets.twitter_post_id
  WHERE tweets.twitter_id = ${req.query.id} AND
  keyword = ${req.query.keyword}
  ORDER BY tweet_date
`);
res.status(200).json({candidates_info});
```

Result:



Tweets from Elizabeth Warren

Search for a Keyword:

Post ID	Keyword	Tweet Date	Post Content
1222884145191407616	gun violence	2020-01-30T08:00:00.000Z	My big, bold Gun Violence Prevention and Community Safety Act with @RepHankJohnson combines & builds upon Congress's best common-sense gun safety legislation for one comprehensive bill to protect our kids & keep our communities safer. #EndGunViolenceBill
1222884146646786048	gun violence	2020-01-30T08:00:00.000Z	I'm grateful that our #EndGunViolenceBill has the support of the @NAACP, @GiffordsCourage, @AMarch4OurLives, @NewtownAction, @stophandguns, & a number of gun violence prevention, civil rights, public health, & community organizations in MA & across the country.
1222932037713133568	gun violence	2020-01-30T08:00:00.000Z	RT @RepHankJohnson: It's long past time for Congress to treat gun violence in America like the public health crisis that it is. That's why...
1222933049979101184	gun violence	2020-01-30T08:00:00.000Z	RT @MassAGO: Thank you @SenWarren. 100 Americans die from gun violence every day. It's time for Congress to stand up to the gun lobby and...
1222933828815204357	gun violence	2020-01-30T08:00:00.000Z	RT @stophandguns: We are proud of our proven success in gun violence prevention in Massachusetts. We applaud Senator Warren for her support...
1222936474213068801	gun violence	2020-01-30T08:00:00.000Z	RT @NewtownAction: It's long past time for Congress to treat gun violence in America like the public health crisis that it is. That's why w...
1222938688046366723	gun violence	2020-01-30T08:00:00.000Z	RT @SUPGVNetwork: Senator Warren's new Gun Violence Prevention and Community Safety Act is exactly the comprehensive national legislation w...
1222982617643069442	gun violence	2020-01-30T08:00:00.000Z	RT @bradybuzz: Today, @SenWarren & @RepHankJohnson introduced a bill to reduce gun violence. It includes: <input checked="" type="checkbox"/> universal background checks <input checked="" type="checkbox"/> sa...
1222984615511625730	gun violence	2020-01-30T08:00:00.000Z	RT @SenatorMenendez: Joining @SenWarren today to release the Gun Violence Prevention and Community Safety Act —sweeping, commonsense gun leg...
1222986009262141456	gun violence	2020-01-30T08:00:00.000Z	RT @po_murray: Newtown was devastated by gun violence. The incremental approach has failed too many American families. That is why I am thr...

Query 4: Obtains a list of all keywords of issues that candidates tweeted about.

```
const keywordList = await db.query(escape`SELECT DISTINCT keyword FROM tweet_content`);
```

Result:

How concerned are candidates about a particular topic?

Select an issue from the list:

- Russia
- nuclear
- health care
- workers
- gun violence
- weapons
- impeachment
- banks
- economy
- Fed
- Iran
- personal interest
- Bolton
- national security
- corruption
- economic
- sham trial

Query 5: Obtains a count of how many tweets were made by each candidate that contains a particular keyword

```
const keyword = await db.query(escape`  
  SELECT C.candidate_name AS "name", TC.Keyword AS "Keyword", COUNT(TC.keyword) AS "strength"  
  FROM candidates AS C  
  JOIN tweets AS T  
  ON C.twitter_id = T.twitter_id  
  JOIN tweet_content AS TC  
  ON T.twitter_post_id = TC.twitter_post_id  
  WHERE TC.keyword = ${req.query.keyword}  
  GROUP BY C.candidate_name;`
```

Result:

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Concern Strength for Keyword "health care"

Candidate Name	Tweets with Keyword
Amy Klobuchar	4
Bernie Sanders	10
Elizabeth Warren	2
Joe Biden	9
Mike Bloomberg	9
Pete Buttigieg	5
Tom Steyer	3
Tulsi Gabbard	4

Appendix E: Web Interface (pictures and description)

Home Page: Obtains a list of candidates from the database and outputs cards for each candidate that link to their individual page. (Candidate pictures are automatically populated by looking for a file with the name of the candidate. If a new candidate was added to the database it would show up but without a picture)




By clicking on an individual candidate, it takes you to a page that is automatically populated by tweets from that particular candidate

Post ID	Keyword	Tweet Date	Post Content
1231662862856310786	economic	2020-02-23T08:00:00.000Z	The American people are sick and tired of a corrupt administration that is undermining American democracy. They are sick and tired of a government based on greed and lies. It is time for an administration based on racial, social, economic and environmental justice.
1232014427937034240	education	2020-02-24T08:00:00.000Z	Other countries around the world understand the importance of child care, early education, and family leave. It is long past time for the United States to join them. Read our plan for free child care and pre-K for all: https://t.co/zELo98tZEY
1232026195996368897	health care	2020-02-24T08:00:00.000Z	Mental health care is health care. No one should be barred from accessing it because of their income. That's why it's covered under Medicare for All.
1232036664199012353	health care	2020-02-24T08:00:00.000Z	This thread shows why we cannot maintain the status quo of our profit-driven health care system. Even "good" insurance doesn't protect Americans from the endless greed of private health insurance companies. We must end this inhumanity and pass Medicare for All. https://t.co/WWZG28K13a
123204377222926850	economic	2020-02-24T08:00:00.000Z	I am proud to have the support of leaders like @JillianDURM who are fighting for economic justice in their communities. Together we are going to guarantee decent, affordable housing and a living wage for all our people. https://t.co/u1rk8gaWEu
1232049385879543808	workers	2020-02-24T08:00:00.000Z	I stand with Denver airport workers who organized with @SEIU. Workers stood together, won raises, and voted to join @SEIU105. I hope to see @United honor their choice. https://t.co/5TAvEixrJo
1232057200631320576	workers	2020-02-24T08:00:00.000Z	We do not need a nominee who profits from private equity vultures and the destruction of the planet. We need someone who is willing to stand up for workers and will stop the greed of the fossil fuel industry. Unlike Mr. Bloomberg, as president, that's exactly what I will do. https://t.co/Qsz8gRAXZ8
1232087418137870337	education	2020-02-24T08:00:00.000Z	Trump believes in tax breaks for billionaires. I believe in investing in the working people of America. We will tax the extreme wealth of the top 0.1% so we can invest \$1.5 trillion to guarantee free, quality child care and early education for all.
1231955724642799616	debt	2020-02-24T08:00:00.000Z	Trump and his Republican friends gave over a trillion dollars in tax breaks to the top 1% and large corporations. I don't think the top 1% and corporations like Amazon need any more breaks. I think we should cancel all student debt and invest in the needs of working people.
123198458333289985	national security	2020-02-24T08:00:00.000Z	I've been criticized for being an "alarmist" on climate change. You're damn right I'm alarmed. Climate change is a major national security threat and a global emergency. That is why we have the boldest plan to address it of any campaign in history. https://t.co/WD4sO5iCSB

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For any candidate, you can filter by only tweets that contain a particular keyword.

[Home](#)
[Issue Tracker](#)
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Tweets from Bernie Sanders

Post ID	Keyword	Tweet Date	Post Content
1231662862856310786	economic	2020-02-23T08:00:00.000Z	The American people are sick and tired of a corrupt administration that is undermining American democracy. They are sick and tired of a government based on greed and lies. It is time for an administration based on racial, social, economic and environmental justice.
123204377222926850	economic	2020-02-24T08:00:00.000Z	I am proud to have the support of leaders like @JillianDURM who are fighting for economic justice in their communities. Together we are going to guarantee decent, affordable housing and a living wage for all our people. https://t.co/u1rk8gaWEu
1233132397891162112	economic	2020-02-27T08:00:00.000Z	This is our time to build a nation based on racial, social, economic and environmental justice. If we stand together, there is nothing we cannot accomplish. Join us live in Richmond, Virginia: https://t.co/luTo5Jm2qJ
1233466191496327168	economic	2020-02-28T08:00:00.000Z	It's pathetic and unacceptable that, while reports of coronavirus infection continue to grow and economic concerns rise, Donald Trump is flying around playing his own political game, traveling to South Carolina in an attempt to disrupt the Democratic primary
123413122206521345	economic	2020-03-01T08:00:00.000Z	I'm honored to receive the endorsement of Black scholars and educators who are fighting for justice and freedom for Black Americans. Together, we will work to end racism in all its forms and achieve racial and economic justice for all. https://t.co/QC2Zsi2OWu
1234226974316474370	economic	2020-03-01T08:00:00.000Z	We are a multigenerational movement. We are a multiracial movement. We are a movement of millions of people who are sick and tired of grotesque income and wealth inequality. We are a movement of millions of people demanding social, racial, economic and environmental justice.

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By clicking on all candidates, it takes you to a separate page that displays a list of tweets by all candidates.

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Tweets from All Candidates

Candidate Name	Keyword	Tweet Date	Post Content
Amy Klobuchar	workers	2020-02-16T08:00:00.000Z	Unions help all workers fight for better wages and workplaces. America needs more unions—not fewer. I'm the granddaughter of a miner and the daughter of a union teacher and union newspaperman. I will always defend the right to organize.
Amy Klobuchar	workers	2020-02-18T08:00:00.000Z	Nevada: If you're ready to make childcare and long-term care more affordable, if you're ready to take on Big Pharma and stand up for workers' rights, join our campaign. We can do this. https://t.co/4q3egltSgn https://t.co/1zNF127Oyx
Amy Klobuchar	workers	2020-02-19T08:00:00.000Z	I stand in solidarity with the Station Casinos workers fighting for a fair contract in Las Vegas at The Palms. When unions are strong, America is strong. I will continue to fight for workers' rights alongside @culinary226, @teamsters, and everyone united in this effort. https://t.co/0E8SKo2kKW
Amy Klobuchar	health care	2020-02-20T08:00:00.000Z	RT @tmjhogan: Well, this is the longest two paragraphs I've ever read. Here's a link to Amy's comprehensive health care plan we can actu...
Amy Klobuchar	health care	2020-02-20T08:00:00.000Z	RT @factcheckdotorg: Elizabeth Warren claimed that Amy Klobuchar's health care plan is two paragraphs long. Warren is wrong. https://t.co/h...
Amy Klobuchar	health care	2020-02-20T08:00:00.000Z	The hard-working people of @culinary226 have health care plans that have been negotiated over time. The same is true for so many Americans right now. There are 149 million Americans that would lose their current health insurance under Medicare for All. #DemDebate https://t.co/5ZVpshVHsu
Amy Klobuchar	McConnell	2020-02-20T08:00:00.000Z	RT @StopBigMoney: #DemDebates: @amyklobuchar points out Mitch McConnell has 400 bills on his desk — including #HR1, the biggest anti-corrup...
Amy Klobuchar	McConnell	2020-02-20T08:00:00.000Z	We need to send Mitch McConnell packing. #DemDebate https://t.co/fdwez9CP1z
Amy Klobuchar	McConnell	2020-02-20T08:00:00.000Z	We need to send Mitch McConnell packing. https://t.co/FR7haQsX5w
Amy Klobuchar	Russia	2020-02-21T08:00:00.000Z	Russia is attacking our democracy again and instead of doing everything he can to stop it, Donald Trump is retaliating against our intelligence officials for doing their jobs. This must stop. https://t.co/mSKiq3LHgn

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By clicking the issue tracker on the navbar, it takes you to a page that lists various issues that candidates are concerned about.

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How concerned are candidates about a particular topic?

Select an issue from the list:

- Russia
- nuclear
- health care
- workers
- gun violence
- weapons
- impeachment
- banks
- economy
- Fed
- Iran
- personal interest
- Bolton
- national security
- corruption
- economic
- sham trial
- climate
- McConnell
- education
- data
- budget
- disabilities
- teachers
- environment
- Iranian
- debt
- William Barr

By clicking on a topic from the list, it displays a table that shows how many tweets were made that contain that issue from each candidate

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Concern Strength for Keyword "health care"

Candidate Name	Tweets with Keyword
Amy Klobuchar	4
Bernie Sanders	10
Elizabeth Warren	2
Joe Biden	9
Mike Bloomberg	9
Pete Buttigieg	5
Tom Steyer	3
Tulsi Gabbard	4

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