Media bias

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May 9, 2020

Goals

Primary: Find objective way to score bias in 36 selected news organizations.

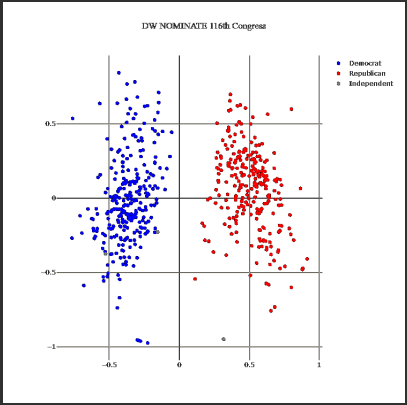
Secondary: Estimate the political bias of a given tweet.

Secondary: Heroku deployment.

Objective Media Bias Rankings

www.mediabias.herokuapp.com

DW-NOMINATE scores



Methodology

1. Gathered tweets from Democratic lawmakers than Republicans (38,491 tweets vs 15,826 tweets) from Alex Litel github repository into SQL database.

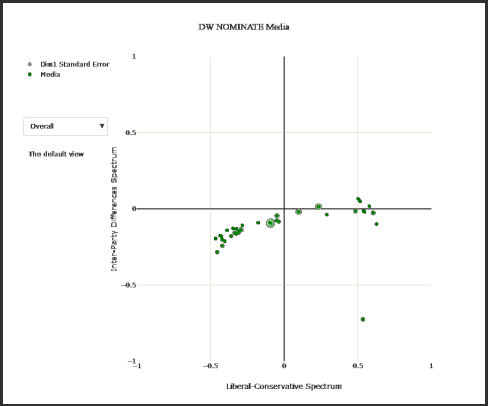
   https://github.com/alexlitel/congresstweets

2. DW-NOMINATE scores of congress people from voteview

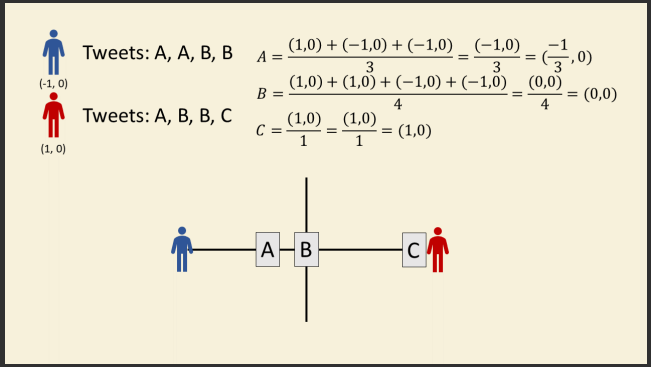
   https://voteview.com/data

3. Queried tweets of congresspeople for the media domains they tweet from and used the congressperson DW-NOMINATE score to score the media domain.

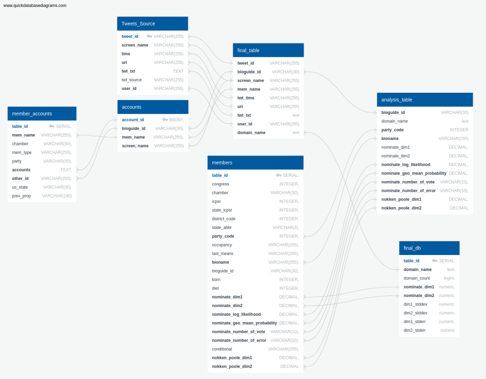
Media domain scores



Method diagram



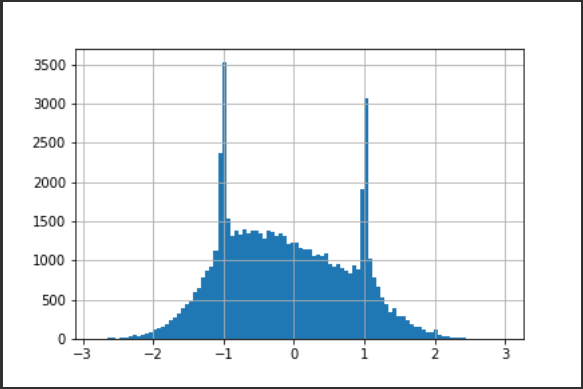
SQL Schema


www.quickdatabasediagrams.com
Tweets_Source
tweet_id VARCHAR(255)
screen_name VARCHAR(255)
time VARCHAR(255)
url VARCHAR(255)
twt_txt TEXT
twt_source VARCHAR(255)
user_id VARCHAR(255)
accounts
account_id BIGINT,
bioguide_id VARCHAR(30),
mem_name VARCHAR(255),
screen_name VARCHAR(255)
member_accounts
table_id SERIAL,
mem_name VARCHAR(255),
chamber VARCHAR(30),
mem_type VARCHAR(255),
party VARCHAR(30),
accounts TEXT,
other_id VARCHAR(255),
us_state VARCHAR(30),
prev_prop VARCHAR(140)
final_table
tweet_id VARCHAR(255)
bioguide_id VARCHAR(30)
screen_name VARCHAR(255)
mem_name VARCHAR(255)
twt_time VARCHAR(255)
url VARCHAR(255)
twt_txt text
user_id VARCHAR(255)
domain_name text
members
table_id SERIAL,
congress INTEGER,
chamber VARCHAR(30),
icpsr INTEGER,
state_icpsr INTEGER,
district_code INTEGER,
state_abbr VARCHAR(3),
party_code INTEGER,
occupancy VARCHAR(255),
last_means VARCHAR(255),
bioname VARCHAR(255),
bioguide_id VARCHAR(30),
born INTEGER,
diet INTEGER,
nominate_dim1 DECIMAL,
nominate_dim2 DECIMAL,
nominate_log_likelihood DECIMAL,
nominate_geo_mean_probability DECIMAL,
nominate_number_of_vote VARCHAR(10),
nominate_number_of_error VARCHAR(10),
conditional VARCHAR(255),
nokken_poole_dim1 DECIMAL,
nokken_poole_dim2 DECIMAL
analysis_table
bioguide_id VARCHAR(30)
domain_name text
party_code INTEGER
bioname VARCHAR(255)
nominate_dim1 DECIMAL,
nominate_dim2 DECIMAL,
nominate_log_likelihood DECIMAL,
nominate_geo_mean_probability DECIMAL,
nominate_number_of_vote VARCHAR(10),
nominate_number_of_error VARCHAR(10),
nokken_poole_dim1 DECIMAL,
nokken_poole_dim2 DECIMAL
final_db
table_id SERIAL,
domain_name text,
domain_count bigint,
nominate_dim1 numeric,
nominate_dim2 numeric,
dim1_stddev numeric,
dim2_stddev numeric,
dim1_stderr numeric,
dim2_stderr numeric

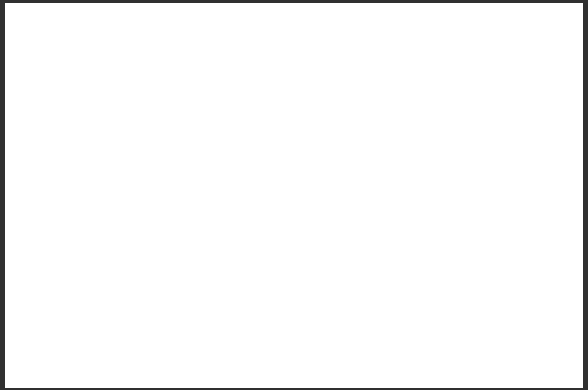
ML Model

1. Use nltk to remove stopwords from tweets.
2. Tweets are vectorized using several schemes.
3. Best performing scheme is selected for fine tuning.
4. End result is Stochastic Gradient Decent Model with X score.
5. Empirical CDF of errors in large test used to estimate probability of making an error.

Test for normality failed (couldn’t use prediction interval)



Empirical Complementary CDF



Passing user input to flask app

```
<div class="col">
    <h2 class="headers">Party Predictor</h2>
    <p>
        Type in a tweet to get a prediction of tweeters political party.
    </p>
    <form method="POST">
        <input name="text">
        <input type="submit">
    </form>
    {{party_prediction}}
</div>
```

Heroku deployment features

- About page - interactive plots.
- ML models page - text box to predict party of tweeter.
- Search Media Scores Page - text box to search SQL data base for media domain.

Heroku difficulty

Flask app, `app.py`, is in a separate directory from heroku config files. This made it difficult to load the scikit learn models into the app. The issue was resolved using by printing information to the page on the current working directory using the os library if the models failed to run:

```
    if loading_error:
        def list_tostring(input_list):
            return '   '.join(input_list)
        party_result = os.getcwd()+' loaded '+str(num_loaded)+'  '+list_tostring(os.listdir())
    else:
```

SQL Query

```
select domain_name, domain_count, nominate_dim1, nominate_dim2, dim1_stddev,
dim2_stddev, round((dim1_stddev/sqrt(domain_count-1))::numeric,3) as dim1_stderr,
round((dim2_stddev/sqrt(domain_count-1))::numeric,3) as dim2_stderr
into final_db
from tenthousand_db
where domain_count>1
group by domain_name, domain_count, nominate_dim1, nominate_dim2, dim1_stddev, dim2_stddev
order by domain_count desc
```

jsonToCSV

```python
def jsonToCSV(json_path, csv_path):
    import json
    import csv
    merged_csv = []
    with open(json_path, encoding='utf-8') as ref:
        data = json.load(ref)
        headers = list(data[0].keys())
        csv_row = []
        for item in data:
            item_ls = []
            for col in headers:
                try:
                    item_ls.append(item[col])
                except:
                    item_ls.append(None)
            csv_row.append(item_ls)
        merged_csv += csv_row

    with open(csv_path, 'w', newline='', encoding='utf-8') as csvfile:
        spamwriter = csv.writer(csvfile)
        for row in merged_csv:
            spamwriter.writerow(row)
```