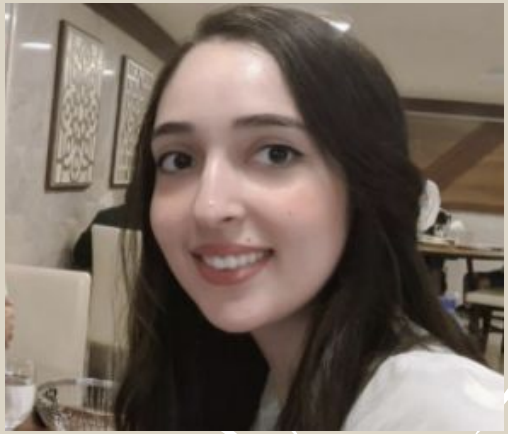
U.S.A.

Debating Debates

By: Lara Fares, Chris Rattigan, JJ Reyes

Who are we?

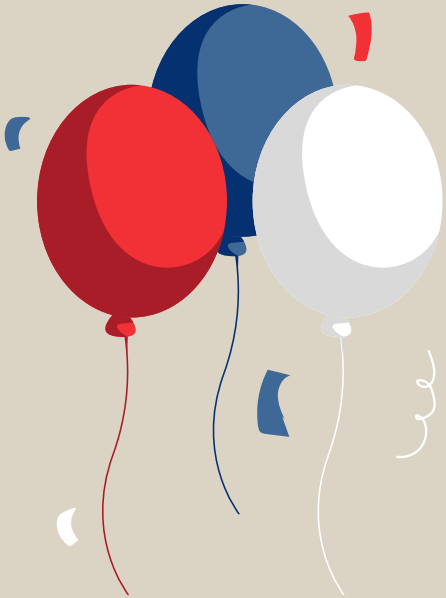
Lara Fares



Chris Ratigan

JJ Reyes

Presentation Overview



1. Raw Data
2. Data Cleaning
3. EDA
4. Models and Results
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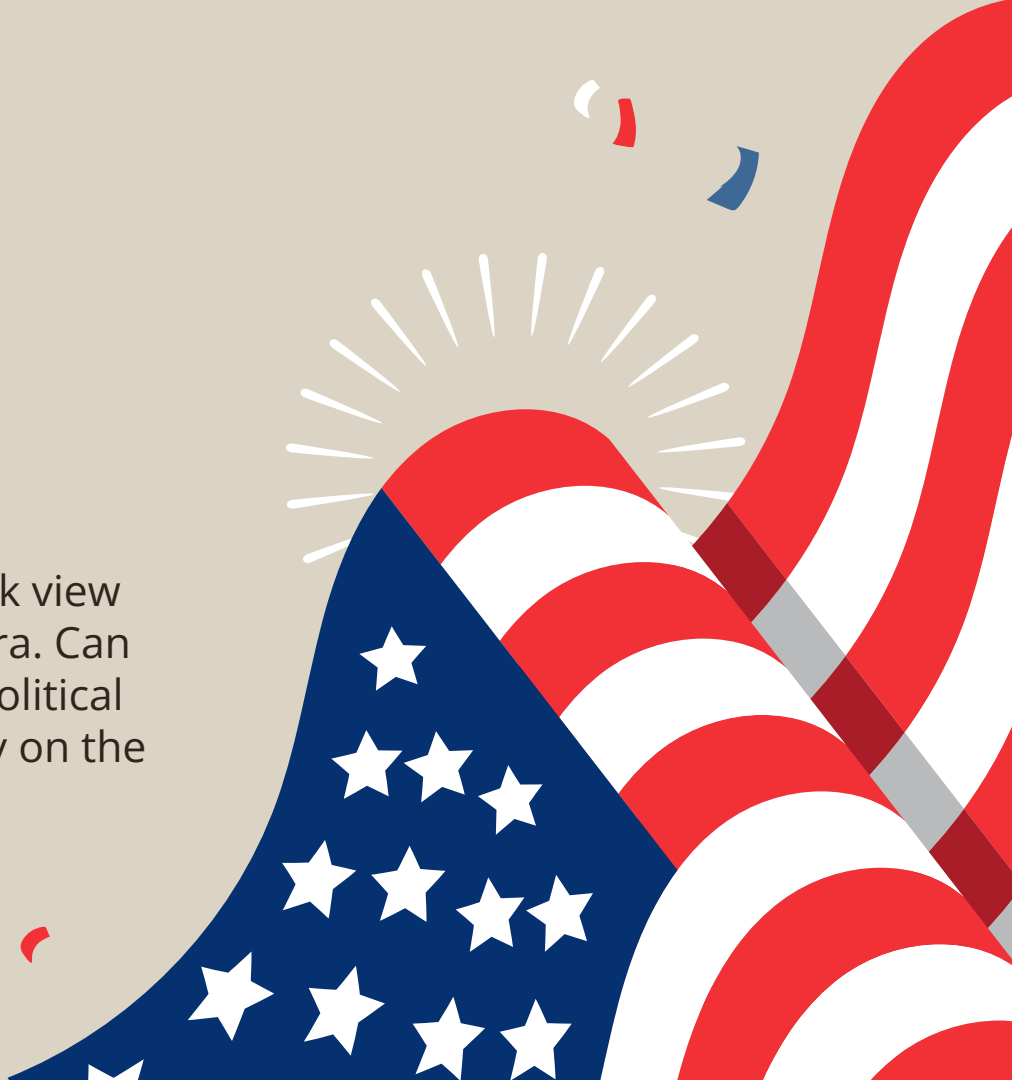
Problem Statement

Presidential debates provide a quick view into the zeitgeist of any particular era. Can we classify the candidates and/or political parties in these debates based solely on the transcripts?



Data Info

https://www.debates.org/

Unique Texts: Over 9000

1960 to 2020

45 Urls Scraped

PARTICIPANTS:
Former Vice President Joe Biden (D) and
President Donald Trump (R)

MODERATOR:
Chris Wallace (Fox News)

WALLACE: Good evening from the Health Education Campus of Case Western Reserve University and the Cleveland Clinic. I'm Chris Wallace of Fox News and I welcome you to the first of the 2020 presidential debates between

Data Diagram

Raw Web Scraped Data

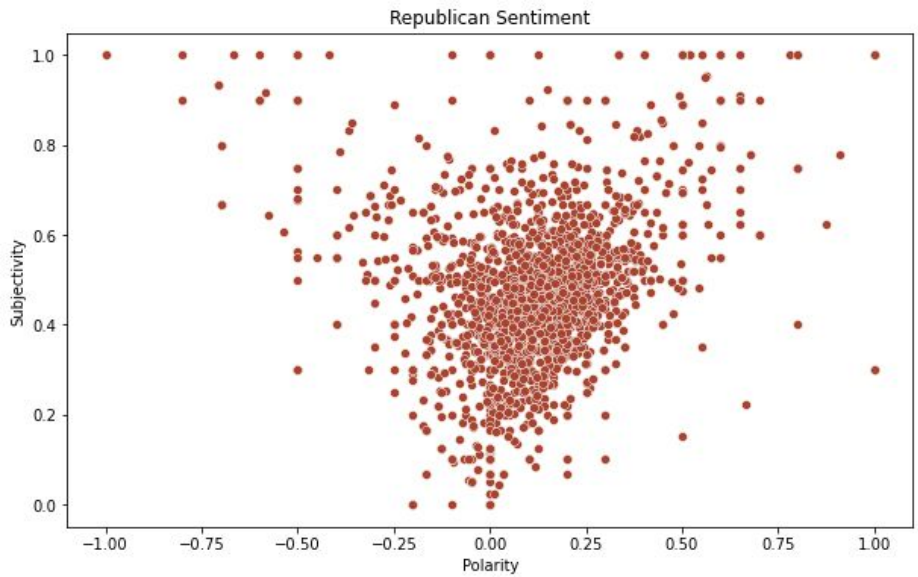
- **Speaker**
  - Moderator (removed)
  - Republican (55%)
  - Democrat (45%)
- **Debate Text**
- **Sentiment**
  - Subjectivity
  - Polarity

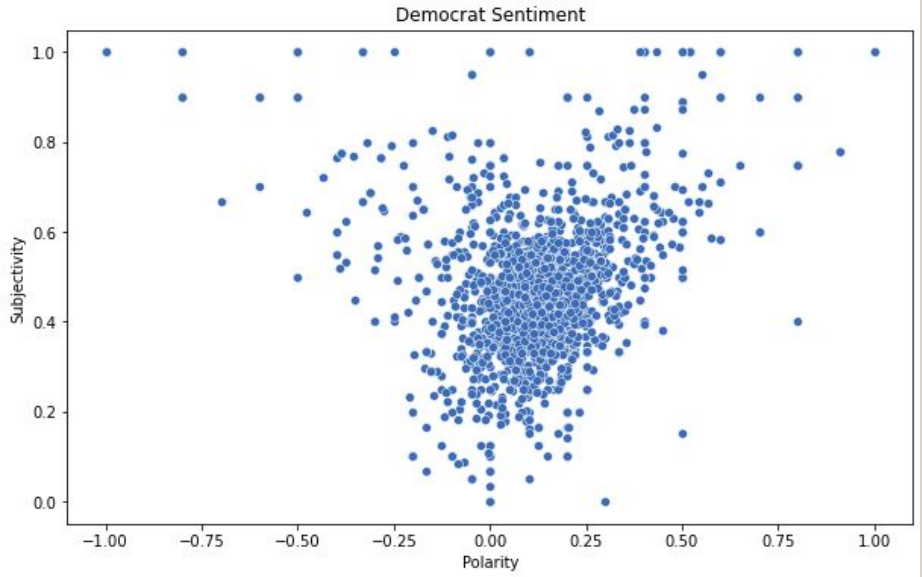
Data Cleaning: Levenshtein Distance!

		k	i	t	t	e	n
	0	1	2	3	4	5	6
s	1	1	2	3	4	5	6
i	2	2	1	2	3	4	5
t	3	3	2	1	2	3	4
t	4	4	3	2	1	2	3
i	5	5	4	3	2	2	3
n	6	6	5	4	3	3	2
g	7	7	6	5	4	4	3

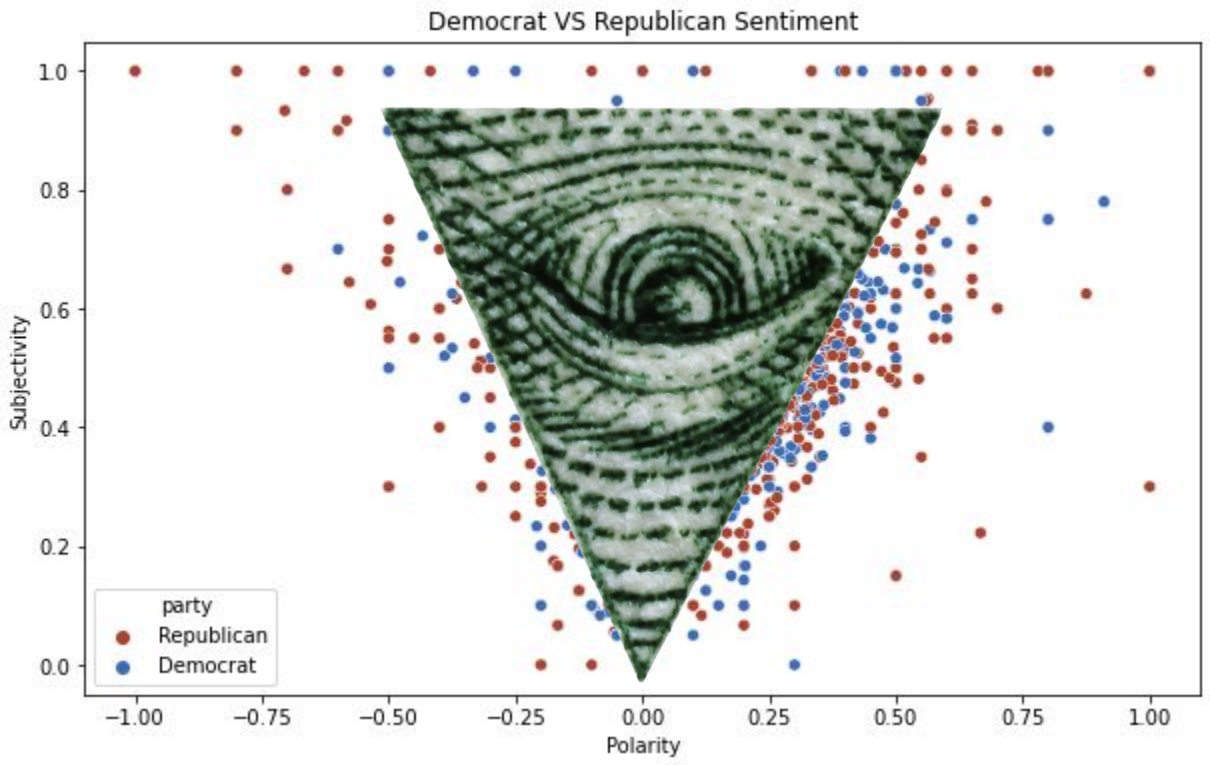
```
('[*]CROWLEY', 'CROWLEY') 3
('[*]SCHIEFFER', 'SCHIEFFER') 3
('MR.FORD', 'FORD') 3
('KONDRACKE', 'MONDALE') 4
('OTIS', 'BUSH') 4
('JOHNSON', 'CLINTON') 4
('OREGONIAN', 'REAGAN') 5
('OBAM', 'OBAMA') 1
('ROMNEHY', 'ROMNEY') 1
('SM1TH', 'SMITH') 1
('REAGAV', 'REAGAN') 1
```

Exploratory Data Analysis: Sentiment

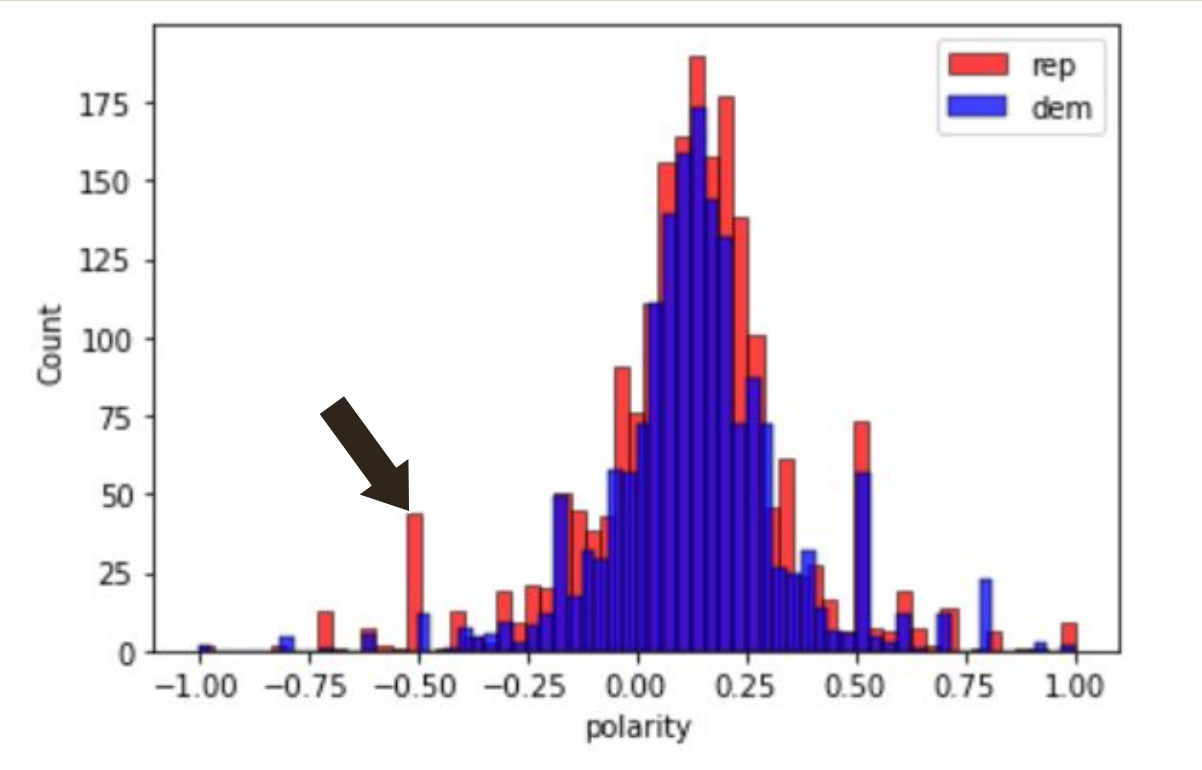




EDA continued



EDA: Polarity by Party



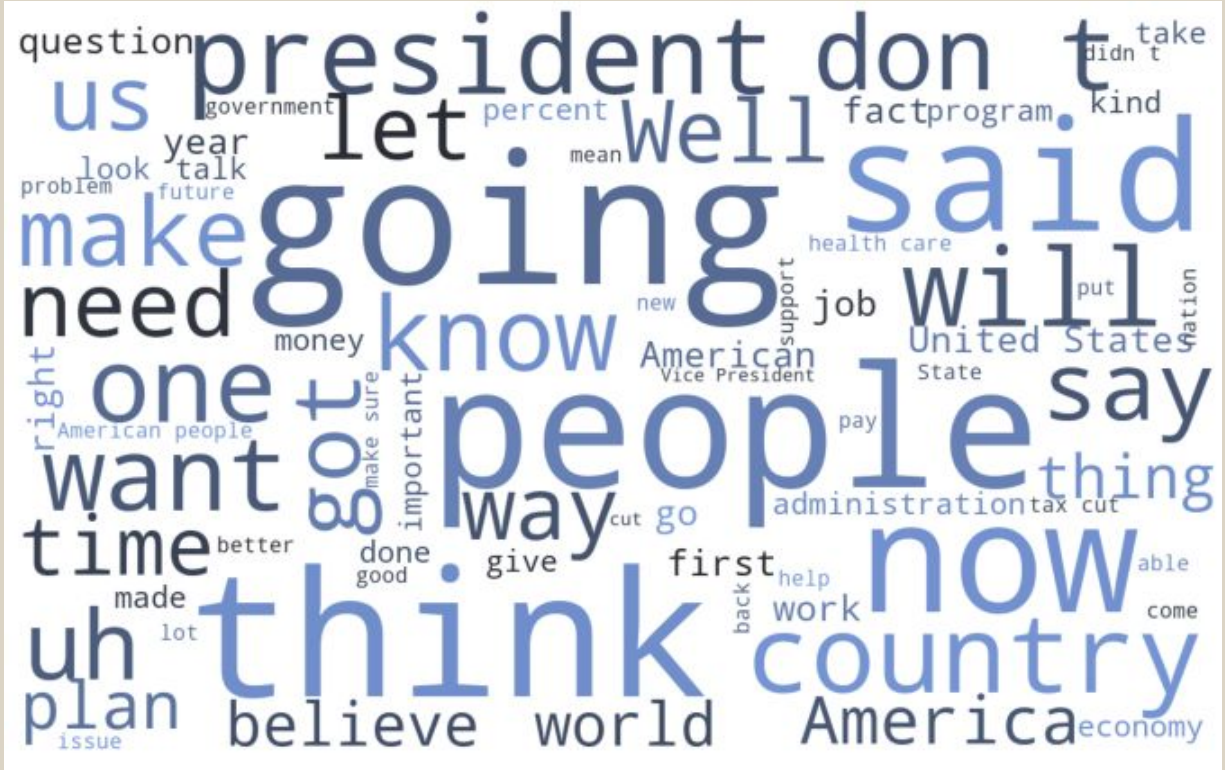
Outlier Example 1

"I get treated worse than the Tea Party got treated. A lot of people in there, deep down in the IRS, they treat me horribly. We made a deal, it was all settled, until I decided to run for president. I get treated very badly by the IRS, very unfairly, but we had a deal all done. As soon as we're completed with the deal, I want to release it. But I have paid millions and millions of dollars. And it's worse than paying. I paid in advance. It's called prepaying your taxes." - Donald J. Trump

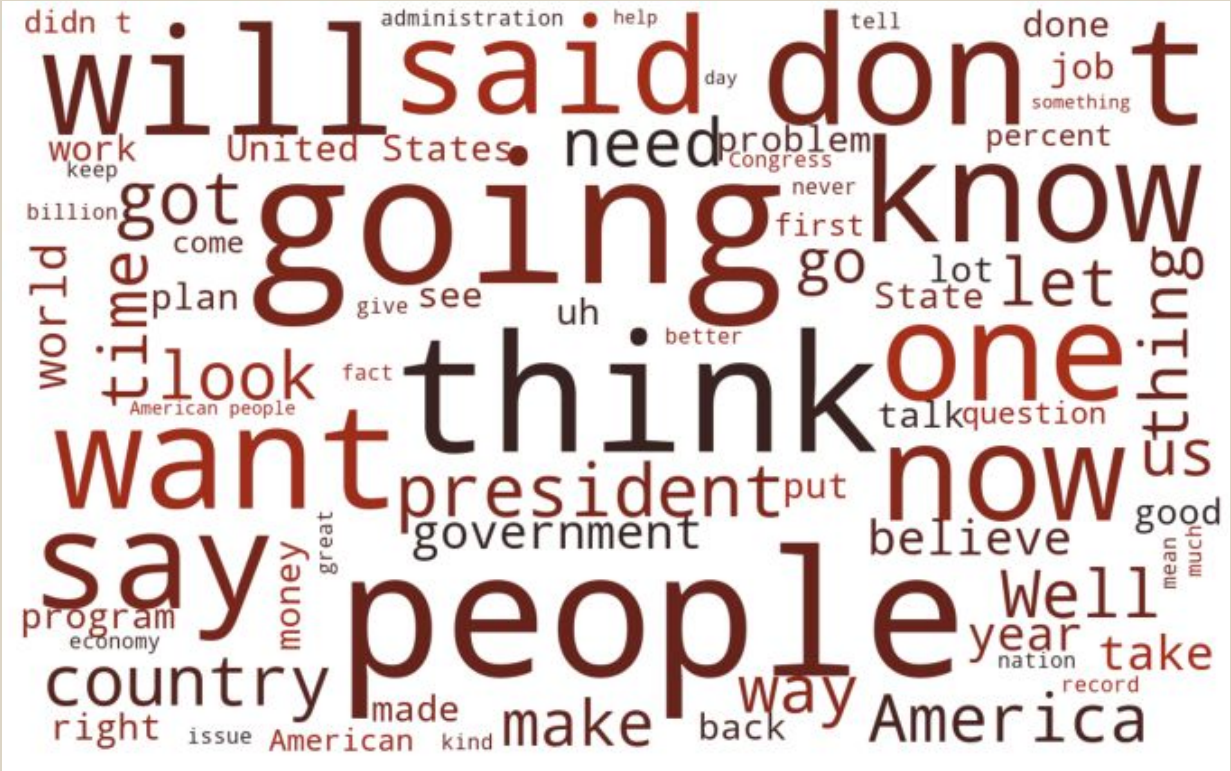
Outlier Example 2

"Wrong" - Donald J. Trump (~10% of the -0.5 polarity cohort)

EDA: Democrat Word Cloud



EDA: Republican Word Cloud



Model Testing Primaries

	Original		Lemmas		Stems	
	Cvect	Tfidf	Cvect	Tfidf	Cvect	Tfidf
MultinomialNB	**0.71**	0.64	0.70	0.64	**0.71**	0.65
LogisticRegression	0.69	0.69	0.69	0.70	0.70	**0.71**
BaggingClassifier	0.64	0.64	0.64	0.64	0.64	0.64
RandomForestClassifier	0.68	0.69	0.69	0.70	0.70	0.68
ExtraTreesClassifier	0.70	0.69	0.70	0.70	0.70	**0.71**
KNeighborsClassifier	0.55	0.68	0.56	0.68	0.56	0.68
SGDClassifier	0.67	0.70	0.70	0.70	0.70	0.70

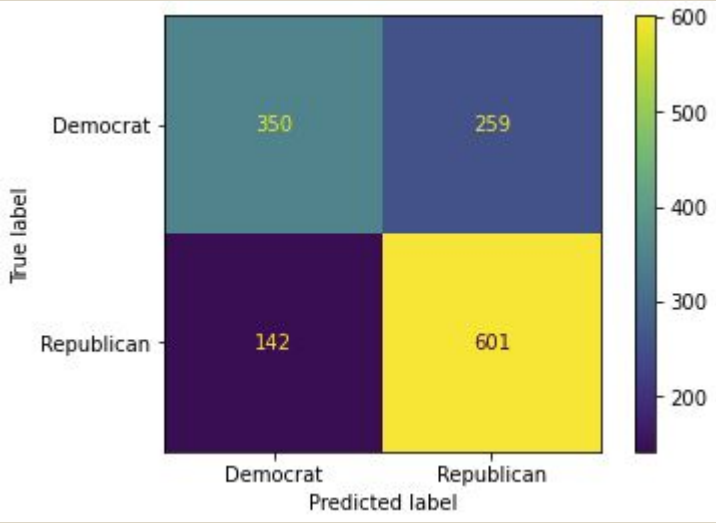
The Winner!

- **LogisticRegression** and **TfidVectorizer** via GridSearch
- LogReg C Value: **2**
- LogReg Fit Intercept: **True**
- Tfid binary: **True**
- Tfid ngram range: **1 - 4**

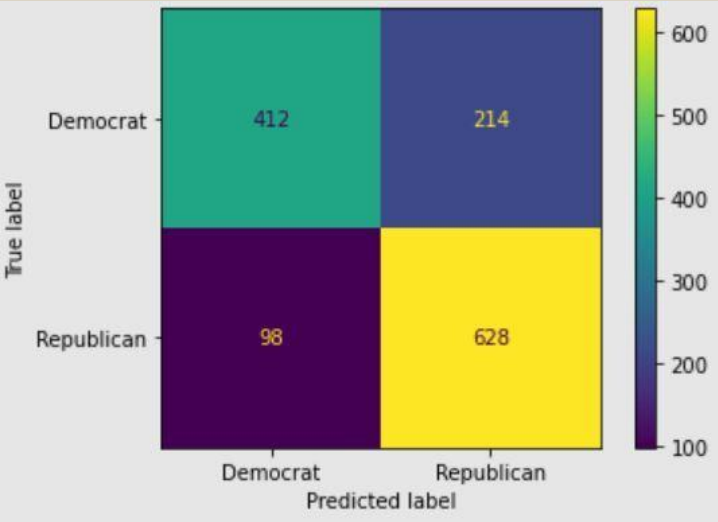
Accuracy Score: **0.76**

Modeling Results: Confusion Matrix

Before GridSearch



After GridSearch



Conclusion

- Democrats and Republicans are actually more similar than different when it comes to debates!
- Republicans have a marginally more negative polarity (especially in recent years).
- Polarity is more split in recent year data vs older debate data which is more down the middle.