Obama Speech NLP Analysis

Team Egypt

Speech Analytics Pipeline

Text Clustering
-K-Means Clustering
-Generate word clouds

Result Interpretation

Date Preprocessing
-Web crawling
-Extract speech date
-Case conversion
-Tokenizations
-Remove redundancie

Topic Modelling
-Set desired topic no.
-Train topic model
-Inspect top words and
top speeches in topics

Time Series Mapping
-Plot topics over time
-Overlay with external
variables (e.g. goverment
expenditures, unemployment
rate etc.)

Data Collecting

- Package: urllib, beautifulSoup

Link of each individual speech

- BeautifulSoup(webpage, 'html.parser')
- soup.find_all('a', href=TRUE) with a_href['href']
- The complete website url format

```
'https://www.americanrhetoric.com/speeches/barackobama/weeklyaddresses/barackobamaweekly1.htm'
```

Contents of the speech

- BeautifulSoup(resp.text, "lxml")
- Extracting the date corresponds to each speech

Data pre-processing

Step 1

- Remove heading and useless words from title and content

| content	content_clean
I stand here today humbled \r\n\t\tby the task...	stand today humble task u grateful trust besto...
We begin this year and this \r\n\t\tAdministra...	begin year administration midst unprecedented ...
- Al-Arabiya Television InterviewBarackObamaAl...	television television interview hisham melhemd...
- Remarks on Executive CompensationBarackObama...	remark executive compensationbarackobamaremark...
Good \r\n\t\tevening, everybody. Please be sea...	good even everybody please take question tonig...

Step 2

- NLTK, WordNetLemmatizer, pos_tag
- StopWords.extend()
- Keep nouns only

NN	noun, singular (cat, tree)
NNS	noun plural (desks)
NNP	proper noun, singular (sarah)
NNPS	proper noun, plural (indians or americans)

K-means

Package: sklearn, wordcloud
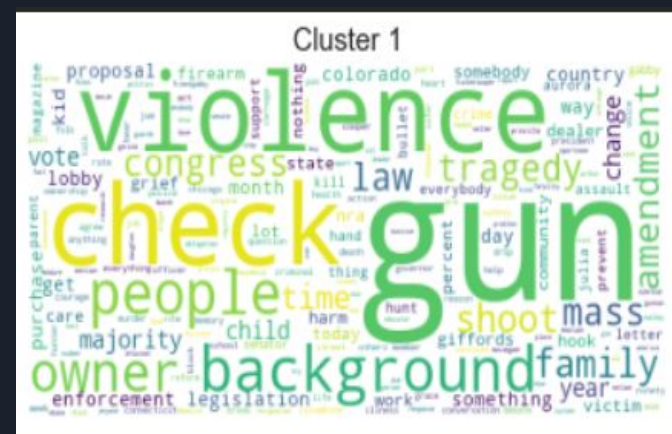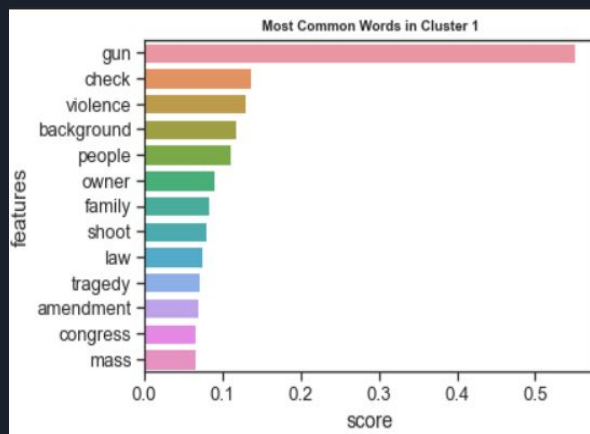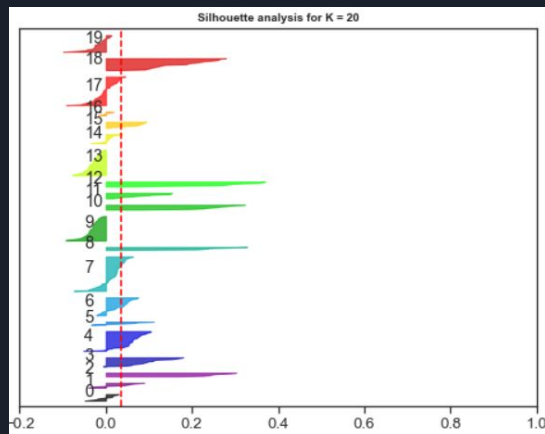
Latent Dirichlet Allocation (LDA)

Package: litter_mallet_wrapper

```
Topic 0

['world', 'people', 'state', 'war', 'nation', 'russia', 'europe', 'conflict', 'action', 'power',
'security', 'support', 'peace', 'effort', 'use', 'weapon', 'regime', 'violence', 'border', 'orde
r']

Topic 1

['isil', 'syria', 'country', 'attack', 'force', 'threat', 'part', 'fight', 'partner', 'world', 'ir
aq', 'coalition', 'fighter', 'kind', 'terrorist', 'target', 'intelligence', 'strategy', 'group',
'france']

Topic 2

['people', 'country', 'question', 'year', 'state', 'world', 'thing', 'change', 'leader', 'societ
y', 'education', 'woman', 'opportunity', 'democracy', 'government', 'start', 'part', 'university',
'everybody', 'group']

Topic 3

['gun', 'violence', 'people', 'law', 'check', 'background', 'shoot', 'tragedy', 'owner', 'majorit
y', 'congress', 'crime', 'enforcement', 'child', 'year', 'hand', 'mass', 'amendment', 'victim', 'p
olice']

Topic 4

['president', 'people', 'question', 'time', 'issue', 'thing', 'way', 'obama', 'something', 'term',
'lot', 'fact', 'point', 'problem', 'get', 'talk', 'state', 'part', 'think', 'look']
```

load_topic_keys()

```
Topic 1

['isil', 'syria', 'country', 'attack', 'force', 'threat', 'part', 'fight', 'partner', 'world', 'ir
aq', 'coalition', 'fighter', 'kind', 'terrorist', 'target', 'intelligence', 'strategy', 'group',
'france']

0.3604 good even american killedas come together celebrate holiday take family friend love deeply
white black latino asian immigrant mom dad daughter son serve fellow citizen part american want ta
lk tragedy broader threat terrorism keep country fbi still gather fact happen san bernardino know
victim brutally murder injure one coworkers wife far evidence killer direct terrorist organization
overseas part broader conspiracy home clear two go dark path radicalization embrace pervert interp
retation islam call war america west stockpile assault weapon ammunition pipe bomb act terrorism d
esign kill innocent nation war terrorist sinceal qaeda kill nearly american process harden defense
airport financial center critical infrastructure intelligence law enforcement agency disrupt count
less plot overseas work around clock keep u safe military counterterrorism professional relentless
ly pursue terrorist network overseas disrupt safe haven several different country kill osama bin l
ade decimate al last year however terrorist threat evolve new phase become better prevent complex
multifaceted attack like terrorist turn le complicate act violence like mass shoot common society
type ofattack saw fort hood chattanooga earlier year san bernardino group like isil grow stronger
amidst chaos war iraq syria internet erase distance country see grow effort terrorist poison mind
people like theboston marathon bombersand san bernardino seven year confront evolve threat morning
intelligence brief since day take office authorize force take terrorist abroad precisely know real
danger greater responsibility security american people father two young daughter precious part lif
e know see friend coworkers holiday party like one san bernardino know see kid face theyoung peopl
e kill paris know much war many american ask whether confront cancer immediate want know threat te
rrorism real overcome destroy isil organization try harm u success depend tough talk abandon value
```
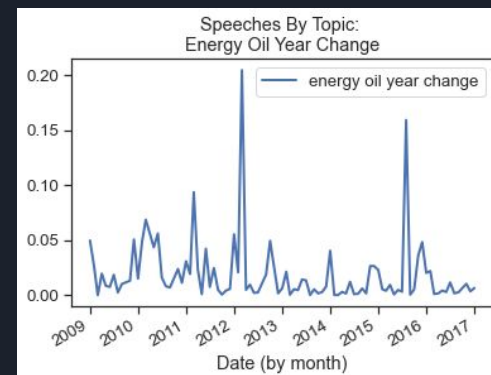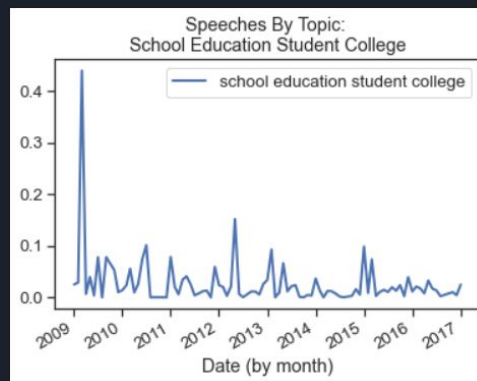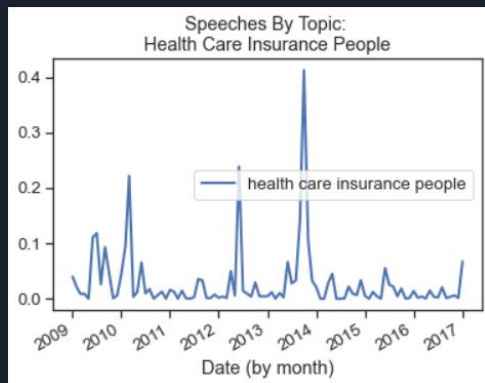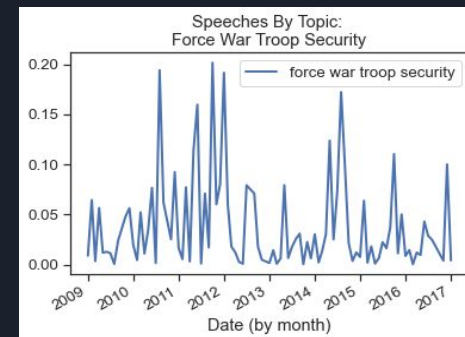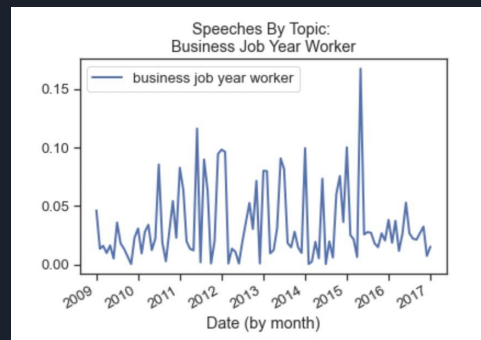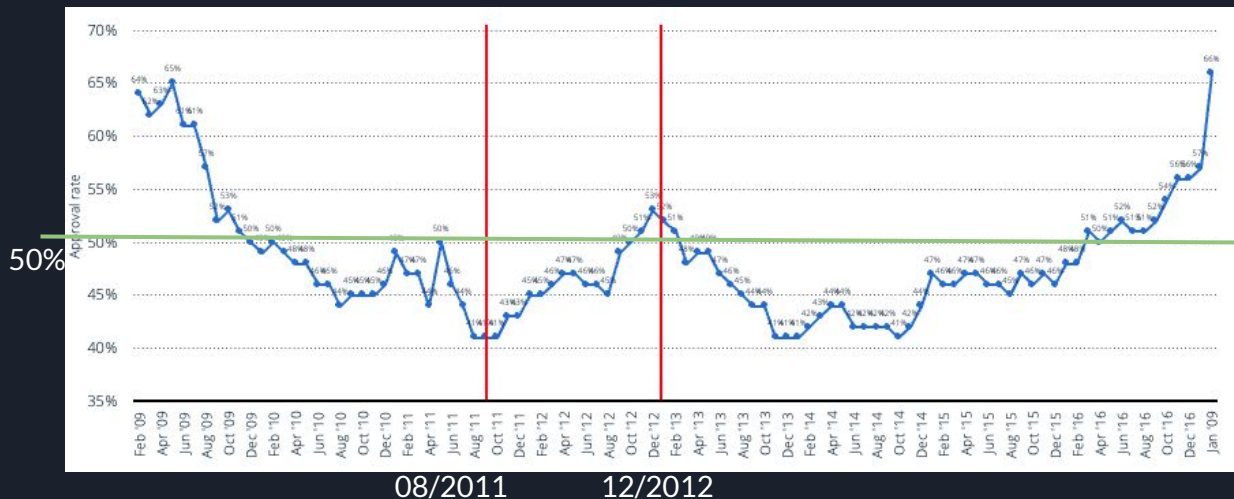
load_topic_distributions()

Topics

We concluded the following topics:
- War/violence
- Health care
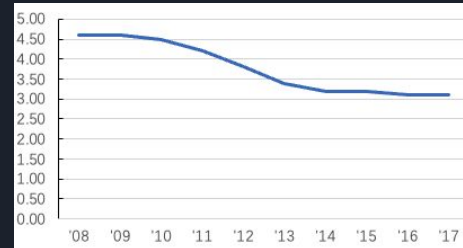- Employment
- Education
- Climate change/clean energy

Speeches By Topic: Business Job Year Worker

Speeches By Topic: Force War Troop Security

Speeches By Topic: Health Care Insurance People

Speeches By Topic: School Education Student College

Speeches By Topic: Energy Oil Year Change

Interpretation

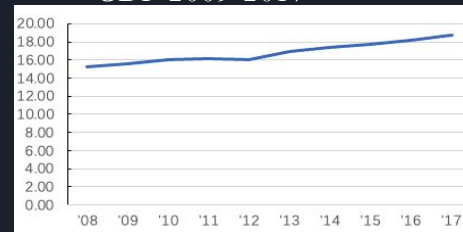*Obama Presidential Job Approval 2009-2017*

50%

08/2011   12/2012

1.Approval rating rose relatively quickly from 41% in August 2011 to 53% in December 2012,other periods was relatively flat

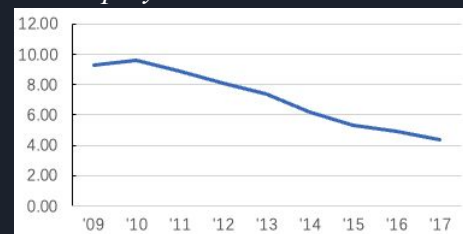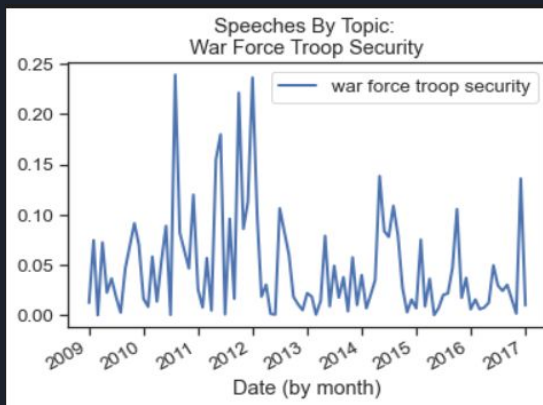*Defense outlays (of GDP) 2009-2017*
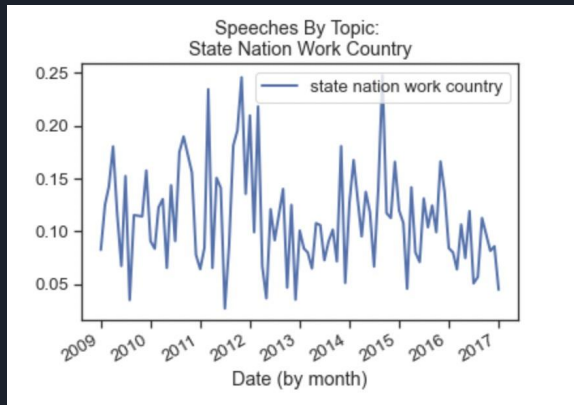

GDP 2009-2017

Unemployment Rate 2009-2017

Interpretation

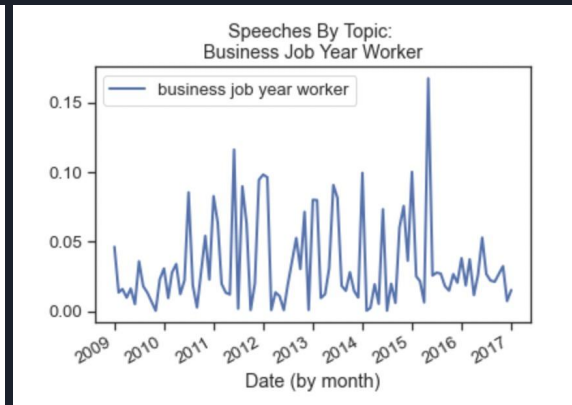During this period, his speeches' main topics : ***war(20%), work(13%),*** *and **Job(13%)***

F1:Proportion of *War*

F2:Proportion of *Work*

F3:Proportion of *Business/Job*

Cause(War)
Ended the war in Iraq

Cause(Work)
Cuted Tax

Cause(Job)
Motivated the American Jobs Act

General conclusion

Obama's speeches reflect the country's social, political and economic events and policies, which is correlated with Approval Ratings.

Approval Ratings — correlate — [End War/Gun Control/Peace…., Employment/Job…., Work/Cut Tax….] — reflect — Obama's Speeches