

Ehsan Hosseinzadeh Khaligh  
Student ID 1112811250

HW4 Report:

### **1) Steps you followed to complete this assignment.**

- a. Since I am using a macbook, there was no need to install Ubuntu.
- b. Both Java and php were already installed.  

```
$ java -version
java version "1.8.0_291"
Java(TM) SE Runtime Environment (build 1.8.0_291-b10)
Java HotSpot(TM) 64-Bit Server VM (build 25.291-b10, mixed mode)

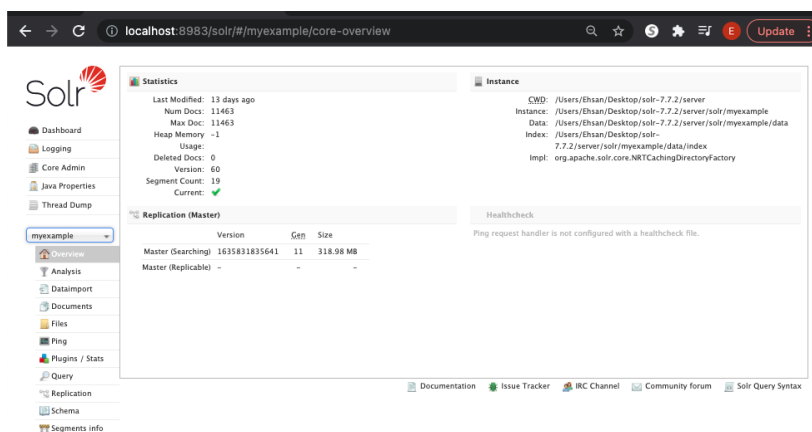
$ php -v
WARNING: PHP is not recommended
PHP is included in macOS for compatibility with legacy software.
Future versions of macOS will not include PHP.
PHP 7.3.24-(to be removed in future macOS) (cli) (built: Jun 17 2021 21:41:15) ( NTS )
Copyright (c) 1997-2018 The PHP Group
Zend Engine v3.3.24, Copyright (c) 1998-2018 Zend Technologies
```
- c. Downloaded Solr 7.7.2 and placed in /Desktop
- d. Opened a terminal and exported  

```
export JAVA_HOME="/Library/Java/JavaVirtualMachines/jdk1.8.0_291.jdk/Contents/Home/"
export PATH=$JAVA_HOME/bin:$PATH
```
- e. Started solr and created a core called 'myexample'  

```
$ cd /Users/Ehsan/Desktop/solr-7.7.2
$ bin/solr start
$ bin/solr create -c myexample
$ pwd
/Users/Ehsan/Desktop/solr-7.7.2/server/solr/myexample
```
- f. Modified managed-schema to comment out  

```
ehsans-MBP-2:conf Ehsan$ pwd
/Users/Ehsan/Desktop/solr-7.7.2/server/solr/myexample/conf
Managed-schema file:
..
<copyField source="" dest="_text_"/>
..
```
- g. Used post command to post download FoxNews crawled data.  

```
$ pwd
/Users/Ehsan/Desktop/solr-7.7.2
Ehsan$ bin/post -c myexample -filetypes html FOXNEWS/foxnews/
```



I tried using the 'q' box to test query output results with Solr UI, but realized there is a bug in the version I am using and it is mentioned also in Piazza.

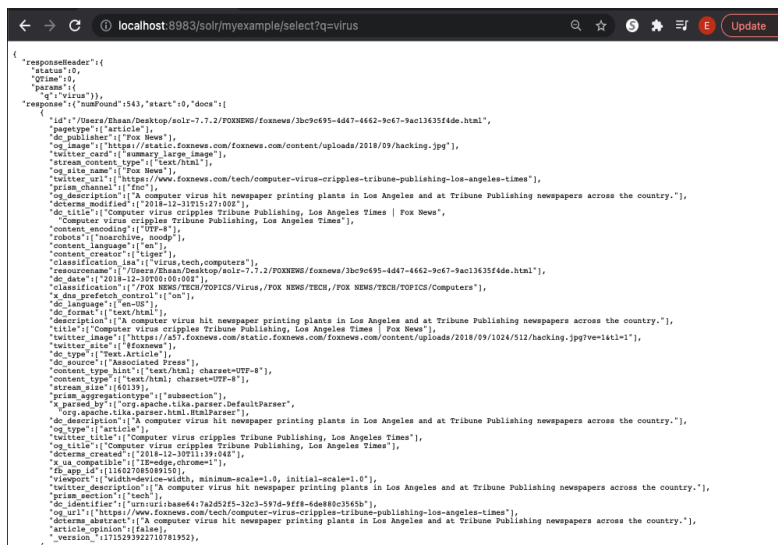
Next Following the instructions, I commented out below line on solrconfig.xml

```
/Users/Ehsan/Desktop/solr-7.7.2/server/solr/myexample/conf/solrconfig.xml
```

```
...
<str name="df">_text_/str>
...
```

Lastly reloaded the new config from UI.

Solr result URL:



- h. Cloned the solr-php-client repo and used [this example](#) as a base line to develop the search UI (Radio Buttons + Display result)

Placed the index.php inside the cloned repo.

```
ehsans-MBP-2:solr-php-client Ehsan$ pwd
/Users/Ehsan/Desktop/solr-php-client
ehsans-MBP-2:solr-php-client Ehsan$ ls
Apache          COPYING          README.md        composer.json    index.php        my.php           tests
```

Once the development of php script finished and lucene was selected as a default, I ran the the local server on localhost:9000

```
ehsans-MBP-2:solr-php-client Ehsan$ pwd
/Users/Ehsan/Desktop/solr-php-client
ehsans-MBP-2:solr-php-client Ehsan$ php -S localhost:9000
```

There were some additional changes inside php such as:

```
$URLtoHTMLcsvFile = file('/Users/Ehsan/Desktop/solr-7.7.2/FOXNEWS/URLtoHTML_fox_news.csv');
$solr = new Apache_Solr_Service('localhost', 8983, '/solr/myexample');
...
```

By the end of this step, I was able to run queries and get results back using Lucene.

*Side note: Since I have Astigmatism and waiting for my new glasses, I added a logic to highlight Title in yellow for testing and compreting results (below screenshots).*

- i. Next, I downloaded <https://jsoup.org/download> jar file and created a project in Eclipse to generate the edgelist.txt given the code template.

Maily two hashmaps have been used to map URLs and HTML files when reading the csv doc.

- j. Once edgelist.txt generated, I installed networkx using python pip to generate external\_pageRankFile.txt using DiGraph().

PageRank algorithm Configuration:

```
nx.pagerank(self.mygraph, alpha=0.85, personalization=None, max_iter=30, tol=1e-06, nstart=None, weight='weight', dangling=None)
```

- k. Once external\_pageRankFile.txt is generated, I placed a copy of the file on /Users/Ehsan/Desktop/solr-7.7.2/server/solr/myexample/data.

Next, I modified managed-schema to add:

```
<fieldType name="external" keyField="id" defVal="0" class="solr.ExternalFileField"/>
<field name="pageRankFile" type="external" stored="false" indexed="false"/>
```

Finally the listener is added to solarconfig.xml and the core is reloaded.

```
<listener event="newSearcher" class="org.apache.solr.schema.ExternalFileFieldReloader"/>
<listener event="firstSearcher" class="org.apache.solr.schema.ExternalFileFieldReloader"/>
```

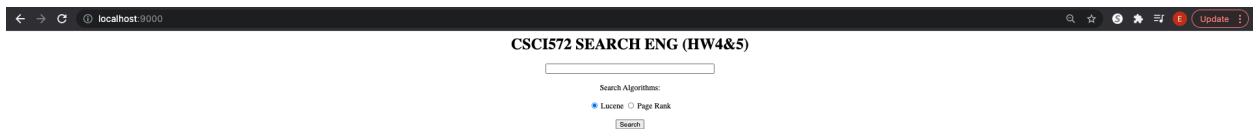
- l. Finally, the search UI also returned documents with PageRank and I started running the query terms to get top 10 search results shown below and have the overlap graph.

pageRankFile desc is used on php as both descending and ascending were options.

## **2) Explanation regarding why some pages have higher PageRank values than others.**

PageRank works by counting the number and quality of links to a page to determine how important the website is. For this reason, mostly home or parent pages are shown on top search results despite not being the most relevant item to the query term(s). As an example, if we look at the 'Senate' search we can see that Lucne returns more specific pages/articles and page rank returns Fox news Parent pages. The underlying assumption is that more important websites are likely to receive more links from other websites in page rank. In contrast, Lucne uses a combination of TF-IDF & vector closeness and to get a better result. If a combination of a page rank alongside TF-IDF and/or Vector space is used, better results can be seen from the search engine.

### **3.1) Screenshot of the initial page where you enter the query in the input box.**



### 3.2) Screenshot of page which shows the results for Lucene(Default).

localhost:9000/elect?q=Cannes&algorithm=lucene

#### CSCI572 SEARCH ENG (HW4&5)

Search Algorithms:  
☒ Lucene ☐ Page Rank

[Search]

Display Results: 1 - 10 | Total Results Found: 30:

**Title: Cannes Film Festival | Fox News**  
 URL: <https://www.foxnews.com/entertainment/cannes-film-festival>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/fate2a43-8962-407b-9b6d-d14d541bc06.html  
 Description: Cannes Film Festival

**Title: Selena Gomez reveals what Bill Murray whupped to her during viral moment on Cannes Film Festival red carpet | Fox News**  
 URL: <https://www.foxnews.com/entertainment/selena-gomez-bill-murray-whupped-cannes-film-festival-red-carpet>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/69a8f991-9c1d-4341-8d7a-b64d1cadf00.html  
 Description: Selena Gomez finally revealed what her "The Dead Don't Die" co-star Bill Murray whupped to her on the red carpet at the Cannes Film Festival in May.

**Title: Selena Gomez shows some skin at Cannes Film Festival in black white dress with thigh-high slit | Fox News**  
 URL: <https://www.foxnews.com/entertainment/selena-gomez-cannes-film-festival-and-cameo>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/01961c-463d-4275-932d-83bd2a3bbad.html  
 Description: Talk about a jaw-dropping moment: Selena Gomez strutted on the red carpet Tuesday at the high-anticipated Cannes Film Festival.

**Title: Ryan Gosling: Eva Mendes is definitely not anti-sweatpants | Fox News**  
 URL: <https://www.foxnews.com/entertainment/ryan-gosling-eva-mendes-is-definitely-not-anti-sweatpants>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/2a84d9f7-992d-4d98-8889-48889b8a9b9.html  
 Description: Ryan Gosling wants you to know that Eva Mendes was totally kidding about being against sweatpants.

**Title: Quentin Tarantino's 'Once Upon a Time in Hollywood' trailer drops | Fox News**  
 URL: <https://www.foxnews.com/entertainment/quentin-tarantino-once-upon-a-time-in-hollywood-trailer-release>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/33605af6-d4a4-4d51-d990-55d5c210fad.html  
 Description: Hippie Hollywood is in full swing in the official trailer for Quentin Tarantino's "Once Upon a Time in Hollywood."

**Title: Whitney Houston was sexually abused during childhood, new documentary claims | Fox News**  
 URL: <https://www.foxnews.com/entertainment/whitney-houston-was-sexually-abused-during-childhood-new-documentary-claims>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/57ab10b-5553-48fb-af6d-bad58f3d136a.html  
 Description: Whitney Houston was sexually abused as a child by a female member of her family, a documentary on her life revealed Wednesday.

**Title: Woody Allen says he won't retire 'no matter what happens in my family or with politics' | Fox News**  
 URL: <https://www.foxnews.com/entertainment/woody-allen-won-t-retire-no-matter-what-happens-in-my-family-or-with-politics>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/6959775-95d-4b19-b7d-0731f051d04.html  
 Description: Woody Allen said in a recent interview that he has no plans to retire from filmmaking regardless of any damage to his reputation or politics.

**Title: Elton John reveals his most difficult scenes to watch in 'Rocketman' biopic | Fox News**  
 URL: <https://www.foxnews.com/entertainment/elton-john-rocketman-biopic-draws-addiction-erasing-disorder>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/fab883b1-6a71-4c9d-b7d-6d8b67c2fad.html  
 Description: Sir Elton John has been living in the public for nearly all his entire adult life.

**Title: 8 John Deere Thanksgivings | Fox News**  
 URL: <https://www.foxnews.com/entertainment/8-john-deere-thanksgivings>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/a92d62b6-35b-4036-9676-7c14d873d6d3d.html  
 Description: When Joan Rivers moved back to her native New York City in the late 1980's, she arrived with an extravagant vision of the baroque residence she planned to create — and of the festive gatherings she would hold there.

**Title: Selena Gomez shows off new dog on Instagram: 'So cute' | Fox News**  
 URL: <https://www.foxnews.com/entertainment/selena-gomez-new-dog-instagram>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/bf156a31-657e-4c58-8a78-bd0f3ba62d7.html  
 Description: It appears Selena Gomez has a new fur baby.

### 3.3) Screenshot of page which shows the results for PageRank.

localhost:9000/elect?q=Cannes&algorithm=pagerank

#### CSCI572 SEARCH ENG (HW4&5)

Search Algorithms:  
☐ Lucene ☒ Page Rank

[Search]

Display Results: 1 - 10 | Total Results Found: 30:

**Title: Roman Polanski accused of 'extremely violent' rape of French woman in 1975 when she was 16, report | Fox News**  
 URL: <https://www.foxnews.com/entertainment/roman-polanski-rape-1975>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/86d5761e-59b9-886d-09af4c2d865.html  
 Description: Roman Polanski is facing new sexual assault allegations.

**Title: Ryan Gosling: Eva Mendes is definitely not anti-sweatpants | Fox News**  
 URL: <https://www.foxnews.com/entertainment/ryan-gosling-eva-mendes-is-definitely-not-anti-sweatpants>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/2a84d9f7-992d-4d98-8889-48889b8a9b9.html  
 Description: Ryan Gosling wants you to know that Eva Mendes was totally kidding about being against sweatpants.

**Title: Julie Andrews says divorce 'saved' her life after her first marriage ended | Fox News**  
 URL: <https://www.foxnews.com/entertainment/julie-andrews-divorce-saved-her-life>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/3d22d0c-6b2d-405d-99f5-8d4c09c1bd.html  
 Description: Julie Andrews revealed it was therapy that saved "The Sound of Music" star's life after her first marriage came to an end in 1967.

**Title: Whitney Houston was sexually abused during childhood, new documentary claims | Fox News**  
 URL: <https://www.foxnews.com/entertainment/whitney-houston-was-sexually-abused-during-childhood-new-documentary-claims>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/57ab10b-5553-48fb-af6d-bad58f3d136a.html  
 Description: Whitney Houston was sexually abused as a child by a female member of her family, a documentary on her life revealed Wednesday.

**Title: Selena Gomez poses with mom, sister in rare family photo, 'Could've been this mom' | Fox News**  
 URL: <https://www.foxnews.com/entertainment/selena-gomez-mom-sister-concert>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/2dab1087-1f0e-4aa2-9d4d-c310342d0460.html  
 Description: Girl time! Selena Gomez was spotted with her mom and sister at a concert over the weekend.

**Title: Sharon Stone Rocks Bikini: See Her Many Appearances | Fox News**  
 URL: <https://www.foxnews.com/entertainment/sharon-stone-rocka-bikini-see-her-many-appearances>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/86d14777-3eef-4743-a0f3-9c7d92d812f.html  
 Description: At age 55, actress Sharon is confidently flaunting her swimwear-ready body in a tiny bikini for the cover of Shape Magazine. PHOTOS: Sharon Stone Wears Body-Hugging Dress To Movie Premiere But the mad to aging gracefully was tough for the sultry "Basic Instinct" star. PHOTOS: 8 Celebs Over 40 Who Look Better With Age "It hasn't been easy," Stone tells Shape. "There was a point in my life when I went into the bathroom with a bottle of wine, locked the door, and said, 'I'm not coming out until I can totally accept the way I look right now.'" READ: Staying Stylish In Your 40s And Beyond Fortunately for us, Stone did eventually come out, but not without shedding some tears first. "I examined my face in the morning mirror, and I looked at my body and I cried and cried," she confessed, as reported by E! Online. "Then I said to myself, 'You're going to get old now. How do you want to do that?'" PHOTOS: The Age-Defying Christie Brinkley And how does Stone keep her fabulous figure in a top shape? According to E!, she wanted to take control of her body by aging "like a dancer," which means working out at the gym daily lots of stretching, and dancing. Regarding her diet, Stone admits to indulging in "perpetrator steak, rib-eyes, and New York strip" only because she has a "very low cholesterol" and very low blood pressure. "However, she is conscious of her eating habits by preparing clean food" as simply as possible, "as well as eating fish. READ: What To Eat In Your 40s, 50s And Beyond However, there is one thing that she's given up on. Prepare to grab the tissues. "I used to love wine, but I don't drink at all now," says Stone. "I think, at a certain point, it's better for women not to have any alcohol because it can make your face, breast, and midsection get very bloated." READ: Julianne Moore's Fab After 50 Secrets While Stone's method of being the best she can be at her age may not work for everyone, the glowing results show. See some of Stone's agents looks below.

**Title: Daphne Lundgren nearly killed Sylvester Stallone while filming 'Rocky IV' | Fox News**  
 URL: <https://www.foxnews.com/entertainment/daphne-lundgren-sylvester-stallone-rocky-iv-battling>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/417d4777-8836-4b74-91bd-6d605d09c56.html  
 Description: Sylvester Stallone and Daphne Lundgren may be the best of friends now, but Sly didn't always love the Swedish-born karate champion.

**Title: Michael Moore endorses Bernie Sanders: 'He isn't afraid to use capitalism in the problem' | Fox News**  
 URL: <https://www.foxnews.com/entertainment/michael-moore-endorses-bernie-sanders>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/4d8c755f-1c0d-4d2d-9762-41b2adef549.html  
 Description: Documentary filmmaker Michael Moore endorsed Sen. Bernie Sanders, D-Vt., for president on Friday. He said Sanders isn't "afraid" to say that capitalism is the problem.

**Title: Elton John reveals his most difficult scenes to watch in 'Rocketman' biopic | Fox News**  
 URL: <https://www.foxnews.com/entertainment/elton-john-rocketman-biopic-draws-addiction-erasing-disorder>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/fab883b1-6a71-4c9d-b7d-6d8b67c2fad.html  
 Description: Sir Elton John has been living in the public for nearly all his entire adult life.

**Title: Cannes Film Festival | Fox News**  
 URL: <https://www.foxnews.com/entertainment/cannes-film-festival>  
 ID: /Users/Ethan/Desktop/7.2.FOXNEWS/foxnews/fate2a43-8962-407b-9b6d-d14d541bc06.html  
 Description: Cannes Film Festival

### 3.4) Screenshot of page of the actual webpage that opens when clicking on one of the result's link.



**4) A table containing a list of URLs of the top ten results produced by both ranking methods for each query.**

Cannes:

Lucene	PageRank
<a href="https://www.foxnews.com/category/entertainment/events/cannes-film-festival">https://www.foxnews.com/category/entertainment/events/cannes-film-festival</a>	<a href="https://www.foxnews.com/entertainment/french-woman-roman-polanski-rape-1975">https://www.foxnews.com/entertainment/french-woman-roman-polanski-rape-1975</a>
<a href="https://www.foxnews.com/entertainment/selena-gomez-bill-murray-whispered-cannes-film-festival-reveal">https://www.foxnews.com/entertainment/selena-gomez-bill-murray-whispered-cannes-film-festival-reveal</a>	<a href="https://www.foxnews.com/entertainment/ryan-gosling-eva-mendes-is-definitely-not-anti-sweatpants">https://www.foxnews.com/entertainment/ryan-gosling-eva-mendes-is-definitely-not-anti-sweatpants</a>
<a href="https://www.foxnews.com/entertainment/selena-gomez-cannes-film-festival-red-carpet">https://www.foxnews.com/entertainment/selena-gomez-cannes-film-festival-red-carpet</a>	<a href="https://www.foxnews.com/entertainment/julie-andrews-therapy-saved-my-life">https://www.foxnews.com/entertainment/julie-andrews-therapy-saved-my-life</a>
<a href="https://www.foxnews.com/entertainment/ryan-gosling-eva-mendes-is-definitely-not-anti-sweatpants">https://www.foxnews.com/entertainment/ryan-gosling-eva-mendes-is-definitely-not-anti-sweatpants</a>	<a href="https://www.foxnews.com/entertainment/whitney-houston-was-sexually-abused-during-childhood-new-documentary-claims">https://www.foxnews.com/entertainment/whitney-houston-was-sexually-abused-during-childhood-new-documentary-claims</a>
<a href="https://www.foxnews.com/entertainment/quentin-tarantino-once-upon-a-time-in-hollywood-trailer-release">https://www.foxnews.com/entertainment/quentin-tarantino-once-upon-a-time-in-hollywood-trailer-release</a>	<a href="https://www.foxnews.com/entertainment/selena-gomez-mom-sister-concert">https://www.foxnews.com/entertainment/selena-gomez-mom-sister-concert</a>
<a href="https://www.foxnews.com/entertainment/whitney-houston-was-sexually-abused-during-childhood-new-documentary-claims">https://www.foxnews.com/entertainment/whitney-houston-was-sexually-abused-during-childhood-new-documentary-claims</a>	<a href="https://www.foxnews.com/entertainment/sharon-stone-rocks-bikini-see-her-many-ageless-looks">https://www.foxnews.com/entertainment/sharon-stone-rocks-bikini-see-her-many-ageless-looks</a>
<a href="https://www.foxnews.com/entertainment/woody-allen-retire-family-politics">https://www.foxnews.com/entertainment/woody-allen-retire-family-politics</a>	<a href="https://www.foxnews.com/entertainment/dolph-lundgren-sylvester-stallone-rocky-iv-hospital">https://www.foxnews.com/entertainment/dolph-lundgren-sylvester-stallone-rocky-iv-hospital</a>
<a href="https://www.foxnews.com/entertainment/elton-john-rocketman-biopic-drugs-addiction-eating-disorder">https://www.foxnews.com/entertainment/elton-john-rocketman-biopic-drugs-addiction-eating-disorder</a>	<a href="https://www.foxnews.com/entertainment/michael-moore-endorses-bernie-sanders">https://www.foxnews.com/entertainment/michael-moore-endorses-bernie-sanders</a>
<a href="https://www.foxnews.com/opinion/a-joan-rivers-thanksgiving">https://www.foxnews.com/opinion/a-joan-rivers-thanksgiving</a>	<a href="https://www.foxnews.com/entertainment/elton-john-rocketman-biopic-drugs-addiction-eating-disorder">https://www.foxnews.com/entertainment/elton-john-rocketman-biopic-drugs-addiction-eating-disorder</a>
<a href="https://www.foxnews.com/entertainment/selena-gomez-new-dog-instagram">https://www.foxnews.com/entertainment/selena-gomez-new-dog-instagram</a>	<a href="https://www.foxnews.com/category/entertainment/events/cannes-film-festival">https://www.foxnews.com/category/entertainment/events/cannes-film-festival</a>

Congress:

Lucene	PageRank
<a href="https://www.foxnews.com/us/navy-vet-donates-gold-star-families-stories-to-library-of-congress">https://www.foxnews.com/us/navy-vet-donates-gold-star-families-stories-to-library-of-congress</a>	<a href="https://www.foxnews.com/opinion">https://www.foxnews.com/opinion</a>
<a href="https://www.foxnews.com/opinion/judge-andrew-apolitano-congress-constitutional-power-declare-war">https://www.foxnews.com/opinion/judge-andrew-apolitano-congress-constitutional-power-declare-war</a>	<a href="https://www.foxnews.com/tech">https://www.foxnews.com/tech</a>
<a href="https://www.foxnews.com/opinion/rep-andy-biggs-congress-debt-ceiling-budget-deal">https://www.foxnews.com/opinion/rep-andy-biggs-congress-debt-ceiling-budget-deal</a>	<a href="https://www.foxnews.com/category/politics/foreign-policy">https://www.foxnews.com/category/politics/foreign-policy</a>
<a href="https://www.foxnews.com/opinion/gutfeld-congress-attacking-zuckerberg">https://www.foxnews.com/opinion/gutfeld-congress-attacking-zuckerberg</a>	<a href="https://www.foxnews.com/category/world/conflicts">https://www.foxnews.com/category/world/conflicts</a>
<a href="https://www.foxnews.com/politics/jon-stewart-blasts-congress-over-9-11-fund-hearing-drove-me-nuts-there-were-empty-seats">https://www.foxnews.com/politics/jon-stewart-blasts-congress-over-9-11-fund-hearing-drove-me-nuts-there-were-empty-seats</a>	<a href="https://www.foxnews.com/official-polls">https://www.foxnews.com/official-polls</a>
<a href="https://www.foxnews.com/category/us/congress">https://www.foxnews.com/category/us/congress</a>	<a href="https://www.foxnews.com/category/politics/executive">https://www.foxnews.com/category/politics/executive</a>
<a href="https://www.foxnews.com/faith-values/bible-school-drew-brees-day-congress">https://www.foxnews.com/faith-values/bible-school-drew-brees-day-congress</a>	<a href="https://www.foxnews.com/category/tech/topics/security">https://www.foxnews.com/category/tech/topics/security</a>
<a href="https://www.foxnews.com/opinion/andy-biggs-congress-judges-immigration-laws">https://www.foxnews.com/opinion/andy-biggs-congress-judges-immigration-laws</a>	<a href="https://www.foxnews.com/opinion/mike-huckabee-lets-fight-for-fabricated-structural-steel-manufacturing-jobs">https://www.foxnews.com/opinion/mike-huckabee-lets-fight-for-fabricated-structural-steel-manufacturing-jobs</a>
<a href="https://www.foxnews.com/opinion/bradley-blakeman-trade-pact-with-canada-and-mexico-offers-incredible-benefits-congress-should-approve-it">https://www.foxnews.com/opinion/bradley-blakeman-trade-pact-with-canada-and-mexico-offers-incredible-benefits-congress-should-approve-it</a>	<a href="http://www.foxnews.com/trending">http://www.foxnews.com/trending</a>
<a href="https://www.foxnews.com/politics/trump-tells-congress-to-immediately-approve-mexico-canada-trade-deal-says-us-moving-past-stupid-years-of-trade-policy">https://www.foxnews.com/politics/trump-tells-congress-to-immediately-approve-mexico-canada-trade-deal-says-us-moving-past-stupid-years-of-trade-policy</a>	<a href="https://www.foxnews.com/media/elijah-cummings-seat-kimberly-klacik-baltimore-election-republican">https://www.foxnews.com/media/elijah-cummings-seat-kimberly-klacik-baltimore-election-republican</a>



Democrats:

Lucene	PageRank
<a href="https://www.foxnews.com/opinion/rnc-chair-mcdaniel-democrats-impeachment-vote-is-baseless-political-vendetta-trump-did-nothing-wrong">https://www.foxnews.com/opinion/rnc-chair-mcdaniel-democrats-impeachment-vote-is-baseless-political-vendetta-trump-did-nothing-wrong</a>	<a href="https://www.foxnews.com/opinion">https://www.foxnews.com/opinion</a>
<a href="https://www.foxnews.com/politics/federal-judge-house-democrats-mazars-subpoena-trump-financial-record">https://www.foxnews.com/politics/federal-judge-house-democrats-mazars-subpoena-trump-financial-record</a>	<a href="https://www.foxnews.com/us">https://www.foxnews.com/us</a>
<a href="https://www.foxnews.com/politics/democrats-arent-actually-impeaching-the-president-yet-but-they-are-digging-deep">https://www.foxnews.com/politics/democrats-arent-actually-impeaching-the-president-yet-but-they-are-digging-deep</a>	<a href="https://www.foxnews.com">https://www.foxnews.com</a>
<a href="https://www.foxnews.com/media/democrats-disdain-working-class-trump-jr-fox-friends">https://www.foxnews.com/media/democrats-disdain-working-class-trump-jr-fox-friends</a>	<a href="https://www.foxnews.com/politics">https://www.foxnews.com/politics</a>
<a href="https://www.foxnews.com/opinion/david-bossie-baseless-trump-impeachment-inquiry-by-desperate-democrats-makes-dramatic-flip-flop">https://www.foxnews.com/opinion/david-bossie-baseless-trump-impeachment-inquiry-by-desperate-democrats-makes-dramatic-flip-flop</a>	<a href="https://www.foxnews.com/category/us/personal-freedoms">https://www.foxnews.com/category/us/personal-freedoms</a>
<a href="https://www.foxnews.com/opinion/rep-andy-biggs-lipstick-impeachment">https://www.foxnews.com/opinion/rep-andy-biggs-lipstick-impeachment</a>	<a href="https://www.foxnews.com/category/politics/house-of-representatives">https://www.foxnews.com/category/politics/house-of-representatives</a>
<a href="https://www.foxnews.com/media/sen-lindsey-graham-every-american-should-be-bothered-by-what-democrats-are-doing-to-trump">https://www.foxnews.com/media/sen-lindsey-graham-every-american-should-be-bothered-by-what-democrats-are-doing-to-trump</a>	<a href="https://www.foxnews.com/category/politics/senate">https://www.foxnews.com/category/politics/senate</a>
<a href="https://www.foxnews.com/opinion/david-bossie-trump-impeachment-vote-is-democratic-declaration-of-war-republicans-must-declare-war-on-dems">https://www.foxnews.com/opinion/david-bossie-trump-impeachment-vote-is-democratic-declaration-of-war-republicans-must-declare-war-on-dems</a>	<a href="https://www.foxnews.com/category/entertainment/music">https://www.foxnews.com/category/entertainment/music</a>
<a href="https://www.foxnews.com/tech/google-facebook-and-twitter-staffs-splurge-on-democrats-ahead-of-midterms">https://www.foxnews.com/tech/google-facebook-and-twitter-staffs-splurge-on-democrats-ahead-of-midterms</a>	<a href="https://www.foxnews.com/category/politics/foreign-policy">https://www.foxnews.com/category/politics/foreign-policy</a>
<a href="https://www.foxnews.com/media/democrats-impeachment-abuse-ken-starr">https://www.foxnews.com/media/democrats-impeachment-abuse-ken-starr</a>	<a href="https://www.foxnews.com/category/world/conflicts">https://www.foxnews.com/category/world/conflicts</a>

## Patriot Movement:

Lucene	PageRank
<a href="https://www.foxnews.com/politics/trump-antifa-terrorist-portland-protests">https://www.foxnews.com/politics/trump-antifa-terrorist-portland-protests</a>	<a href="https://www.foxnews.com/science">https://www.foxnews.com/science</a>
<a href="https://www.foxnews.com/world/iranian-cruise-missiles-drones-saudi-oil">https://www.foxnews.com/world/iranian-cruise-missiles-drones-saudi-oil</a>	<a href="https://www.foxnews.com">https://www.foxnews.com</a>
<a href="https://www.foxnews.com/transcript/gutfeld-w-hats-a-liberal-to-do-when-a-republican-turns-out-to-be-better-at-compassion">https://www.foxnews.com/transcript/gutfeld-w-hats-a-liberal-to-do-when-a-republican-turns-out-to-be-better-at-compassion</a>	<a href="https://www.foxnews.com/tech">https://www.foxnews.com/tech</a>
<a href="https://www.foxnews.com/media/fox-nation-patriot-awards-american-heroes-st-petersburg">https://www.foxnews.com/media/fox-nation-patriot-awards-american-heroes-st-petersburg</a>	<a href="https://www.foxnews.com/category/science/planet-earth">https://www.foxnews.com/category/science/planet-earth</a>
<a href="https://www.foxnews.com/media/marine-vet-most-valuable-patriot-awards-congress">https://www.foxnews.com/media/marine-vet-most-valuable-patriot-awards-congress</a>	<a href="https://www.foxnews.com/category/entertainment/movies">https://www.foxnews.com/category/entertainment/movies</a>
<a href="https://www.foxnews.com/media/fox-nation-patriot-awards">https://www.foxnews.com/media/fox-nation-patriot-awards</a>	<a href="https://www.foxnews.com/entertainment/gwyneth-paltrow-relationship-harvey-weinstein">https://www.foxnews.com/entertainment/gwyneth-paltrow-relationship-harvey-weinstein</a>
<a href="https://www.foxnews.com/media/tomi-lahren-patriot-awards-fox-nation">https://www.foxnews.com/media/tomi-lahren-patriot-awards-fox-nation</a>	<a href="https://www.foxnews.com/politics/aoc-bloomberg-purchase-election">https://www.foxnews.com/politics/aoc-bloomberg-purchase-election</a>
<a href="https://www.foxnews.com/faith-values/veterans-serve-disaster-relief">https://www.foxnews.com/faith-values/veterans-serve-disaster-relief</a>	<a href="https://www.foxnews.com/world/ukraine-russia-separatists-pullback">https://www.foxnews.com/world/ukraine-russia-separatists-pullback</a>
<a href="https://www.foxnews.com/entertainment/netflix-pulls-patriot-act-with-hasan-minhaj-episode-after-getting-valid-legal-complaint-from-saudi-arabia">https://www.foxnews.com/entertainment/netflix-pulls-patriot-act-with-hasan-minhaj-episode-after-getting-valid-legal-complaint-from-saudi-arabia</a>	<a href="https://www.foxnews.com/science/earths-mantle-and-crust-are-in-a-fiery-battle-to-the-death-of-supercontinents">https://www.foxnews.com/science/earths-mantle-and-crust-are-in-a-fiery-battle-to-the-death-of-supercontinents</a>
<a href="https://www.foxnews.com/tech/netflix-defends-pulling-patriot-act-episode-in-saudi-arabia">https://www.foxnews.com/tech/netflix-defends-pulling-patriot-act-episode-in-saudi-arabia</a>	<a href="https://www.foxnews.com/auto/2020-ram-1500-built-to-serve-pickup-salutes-the-u-s-military">https://www.foxnews.com/auto/2020-ram-1500-built-to-serve-pickup-salutes-the-u-s-military</a>

Republicans:

Lucene	PageRank
<a href="https://www.foxnews.com/politics/house-republicans-storm-impeachment-inquiry-deposition-what-went-down">https://www.foxnews.com/politics/house-republicans-storm-impeachment-inquiry-deposition-what-went-down</a>	<a href="https://www.foxnews.com/opinion">https://www.foxnews.com/opinion</a>
<a href="https://www.foxnews.com/opinion/tom-del-becaro-republicans-must-win-the-impeachment-trial-and-they-can-by-following-these-five-steps">https://www.foxnews.com/opinion/tom-del-becaro-republicans-must-win-the-impeachment-trial-and-they-can-by-following-these-five-steps</a>	<a href="https://www.foxnews.com">https://www.foxnews.com</a>
<a href="https://www.foxnews.com/politics/republicans-hunter-biden-ukraine-whistleblower-impeachment-witness">https://www.foxnews.com/politics/republicans-hunter-biden-ukraine-whistleblower-impeachment-witness</a>	<a href="https://www.foxnews.com/politics">https://www.foxnews.com/politics</a>
<a href="https://www.foxnews.com/politics/bill-weld-thrilled-other-republicans-are-challenging-trump-in-primary">https://www.foxnews.com/politics/bill-weld-thrilled-other-republicans-are-challenging-trump-in-primary</a>	<a href="https://www.foxnews.com/category/politics/house-of-representatives">https://www.foxnews.com/category/politics/house-of-representatives</a>
<a href="https://www.foxnews.com/politics/house-republicans-plan-to-call-adam-schiff-to-testify-in-impeachment-inquiry-call-him-a-fact-witness">https://www.foxnews.com/politics/house-republicans-plan-to-call-adam-schiff-to-testify-in-impeachment-inquiry-call-him-a-fact-witness</a>	<a href="https://www.foxnews.com/category/politics/senate">https://www.foxnews.com/category/politics/senate</a>
<a href="https://www.foxnews.com/politics/republicans-impeachment-hearings-lineup">https://www.foxnews.com/politics/republicans-impeachment-hearings-lineup</a>	<a href="https://www.foxnews.com/category/world/conflicts">https://www.foxnews.com/category/world/conflicts</a>
<a href="https://www.foxnews.com/politics/trump-settles-score-with-republicans-who-didnt-embrace-him-in-midterms">https://www.foxnews.com/politics/trump-settles-score-with-republicans-who-didnt-embrace-him-in-midterms</a>	<a href="https://www.foxnews.com/official-polls">https://www.foxnews.com/official-polls</a>
<a href="https://www.foxnews.com/opinion/newt-gingrich-house-republicans-2020-retirements">https://www.foxnews.com/opinion/newt-gingrich-house-republicans-2020-retirements</a>	<a href="https://www.foxnews.com/category/world/scandals">https://www.foxnews.com/category/world/scandals</a>
<a href="https://www.foxnews.com/opinion/matt-gorman-kavanaugh-republicans">https://www.foxnews.com/opinion/matt-gorman-kavanaugh-republicans</a>	<a href="https://www.foxnews.com/category/politics/elections">https://www.foxnews.com/category/politics/elections</a>
<a href="https://www.foxnews.com/media/joe-biden-republicans-epiphany-trump">https://www.foxnews.com/media/joe-biden-republicans-epiphany-trump</a>	<a href="https://www.foxnews.com/politics">https://www.foxnews.com/politics</a>

Senate:

Lucene	PageRank
<a href="https://www.foxnews.com/politics/trump-senate-trial-impeachment-inquiry-reporters-notebook">https://www.foxnews.com/politics/trump-senate-trial-impeachment-inquiry-reporters-notebook</a>	<a href="https://www.foxnews.com/opinion">https://www.foxnews.com/opinion</a>
<a href="https://www.foxnews.com/category/politics/2020-senate-races">https://www.foxnews.com/category/politics/2020-senate-races</a>	<a href="https://www.foxnews.com/travel">https://www.foxnews.com/travel</a>
<a href="https://www.foxnews.com/media/jeff-sessions-former-embattled-trump-attorney-general-announces-bid-for-old-us-senate-seat">https://www.foxnews.com/media/jeff-sessions-former-embattled-trump-attorney-general-announces-bid-for-old-us-senate-seat</a>	<a href="https://www.foxnews.com/us">https://www.foxnews.com/us</a>
<a href="https://www.foxnews.com/opinion/newt-gingrich-left-viciously-attacks-mcconnell-because-hes-successful-senate-leader-and-trump-ally">https://www.foxnews.com/opinion/newt-gingrich-left-viciously-attacks-mcconnell-because-hes-successful-senate-leader-and-trump-ally</a>	<a href="https://www.foxnews.com/health">https://www.foxnews.com/health</a>
<a href="https://www.foxnews.com/faith-values/pastor-andrew-brunson-senate-trump-prayer">https://www.foxnews.com/faith-values/pastor-andrew-brunson-senate-trump-prayer</a>	<a href="https://www.foxnews.com/shows">https://www.foxnews.com/shows</a>
<a href="https://www.foxnews.com/politics/jeff-sessions-alabama-senate-campaign-expected">https://www.foxnews.com/politics/jeff-sessions-alabama-senate-campaign-expected</a>	<a href="https://www.foxnews.com/entertainment">https://www.foxnews.com/entertainment</a>
<a href="https://www.foxnews.com/category/politics/elections/senate">https://www.foxnews.com/category/politics/elections/senate</a>	<a href="https://www.foxnews.com/world">https://www.foxnews.com/world</a>
<a href="https://www.foxnews.com/politics/trump-sessions-against-senate-run-alabama">https://www.foxnews.com/politics/trump-sessions-against-senate-run-alabama</a>	<a href="https://www.foxnews.com/science">https://www.foxnews.com/science</a>
<a href="https://www.foxnews.com/media/judge-pirro-jeff-sessions-senate-run-fox-friends">https://www.foxnews.com/media/judge-pirro-jeff-sessions-senate-run-fox-friends</a>	<a href="https://www.foxnews.com">https://www.foxnews.com</a>
<a href="https://www.foxnews.com/politics/virginia-democrat-accused-of-sex-with-teen-secretary-wins-state-senate-seat">https://www.foxnews.com/politics/virginia-democrat-accused-of-sex-with-teen-secretary-wins-state-senate-seat</a>	<a href="https://www.foxnews.com/politics">https://www.foxnews.com/politics</a>

Olympics 2020:

Lucene	PageRank
<a href="https://www.foxnews.com/sports/alex-morgan-2020-olympics-child-birth">https://www.foxnews.com/sports/alex-morgan-2020-olympics-child-birth</a>	<a href="https://www.foxnews.com/opinion">https://www.foxnews.com/opinion</a>
<a href="https://www.foxnews.com/sports/naomi-osaka-us-citizenship-japan-2020-olympics">https://www.foxnews.com/sports/naomi-osaka-us-citizenship-japan-2020-olympics</a>	<a href="https://www.foxnews.com/entertainment">https://www.foxnews.com/entertainment</a>
<a href="https://www.foxnews.com/category/sports/olympics">https://www.foxnews.com/category/sports/olympics</a>	<a href="https://www.foxnews.com">https://www.foxnews.com</a>
<a href="https://www.foxnews.com/tech/russian-hackers-attack-possible-olympic-ban">https://www.foxnews.com/tech/russian-hackers-attack-possible-olympic-ban</a>	<a href="https://www.foxnews.com/politics">https://www.foxnews.com/politics</a>
<a href="https://www.foxnews.com/category/sports/soccer">https://www.foxnews.com/category/sports/soccer</a>	<a href="https://www.foxnews.com/tech">https://www.foxnews.com/tech</a>
<a href="https://www.foxnews.com/person/c/barnini-chakraborty">https://www.foxnews.com/person/c/barnini-chakraborty</a>	<a href="https://www.foxnews.com/category/health/heart-health">https://www.foxnews.com/category/health/heart-health</a>
<a href="https://www.foxnews.com/category/sports/tennis">https://www.foxnews.com/category/sports/tennis</a>	<a href="https://www.foxnews.com/lifestyle">https://www.foxnews.com/lifestyle</a>
<a href="https://www.foxnews.com/category/person/alex-morgan">https://www.foxnews.com/category/person/alex-morgan</a>	<a href="https://www.foxnews.com/category/us/personal-freedoms">https://www.foxnews.com/category/us/personal-freedoms</a>
<a href="https://www.foxnews.com/sports/kikkan-randall-new-york-city-marathon-skiing-cancer">https://www.foxnews.com/sports/kikkan-randall-new-york-city-marathon-skiing-cancer</a>	<a href="https://www.foxnews.com/category/entertainment/style">https://www.foxnews.com/category/entertainment/style</a>
<a href="https://www.foxnews.com/sports">https://www.foxnews.com/sports</a>	<a href="https://www.foxnews.com/category/entertainment/tv">https://www.foxnews.com/category/entertainment/tv</a>

Stock:

Lucene	PageRank
<a href="https://www.foxnews.com/tech/jeff-bezos-to-be-no-2-richest-behind-bill-gates-after-amazon-stock-drop">https://www.foxnews.com/tech/jeff-bezos-to-be-no-2-richest-behind-bill-gates-after-amazon-stock-drop</a>	<a href="https://www.foxnews.com">https://www.foxnews.com</a>
<a href="https://www.foxnews.com/transcript/cavuto-looking-back-at-the-stock-market-crash-30-years-ago">https://www.foxnews.com/transcript/cavuto-looking-back-at-the-stock-market-crash-30-years-ago</a>	<a href="https://www.foxnews.com/category/us/economy">https://www.foxnews.com/category/us/economy</a>
<a href="https://www.foxnews.com/transcript/cavuto-the-markets-are-easier-to-take-stock-of-than-life">https://www.foxnews.com/transcript/cavuto-the-markets-are-easier-to-take-stock-of-than-life</a>	<a href="https://www.foxnews.com/science/revolutionary-war-rifle-stolen-50-years-ago-on-display">https://www.foxnews.com/science/revolutionary-war-rifle-stolen-50-years-ago-on-display</a>
<a href="https://www.foxnews.com/category/shows/your-world/transcript/common-sense">https://www.foxnews.com/category/shows/your-world/transcript/common-sense</a>	<a href="https://www.foxnews.com/entertainment/demi-lovato-first-interview-year">https://www.foxnews.com/entertainment/demi-lovato-first-interview-year</a>
<a href="https://www.foxnews.com/category/tech/companies/microsoft">https://www.foxnews.com/category/tech/companies/microsoft</a>	<a href="https://www.foxnews.com/media/chris-wallace-elizabeth-warren-medicare-for-all-plan">https://www.foxnews.com/media/chris-wallace-elizabeth-warren-medicare-for-all-plan</a>
<a href="https://www.foxnews.com/person/c/gordon-chang">https://www.foxnews.com/person/c/gordon-chang</a>	<a href="https://www.foxnews.com/tech/hp-recalls-more-laptop-lithium-ion-batteries-after-reports-of-overheating-melting-and-charring">https://www.foxnews.com/tech/hp-recalls-more-laptop-lithium-ion-batteries-after-reports-of-overheating-melting-and-charring</a>
<a href="https://www.foxnews.com/category/tech/companies/amazon">https://www.foxnews.com/category/tech/companies/amazon</a>	<a href="https://www.foxnews.com/tech/heres-how-the-trump-tariffs-hike-may-affect-prices-for-pc-parts">https://www.foxnews.com/tech/heres-how-the-trump-tariffs-hike-may-affect-prices-for-pc-parts</a>
<a href="https://www.foxnews.com/sports/royals-hire-ex-cardinals-skipper-mike-matheny-as-manager">https://www.foxnews.com/sports/royals-hire-ex-cardinals-skipper-mike-matheny-as-manager</a>	<a href="https://www.foxnews.com/category/tech/companies/amazon">https://www.foxnews.com/category/tech/companies/amazon</a>
<a href="https://www.foxnews.com/category/person/sheryl-sandberg">https://www.foxnews.com/category/person/sheryl-sandberg</a>	<a href="https://www.foxnews.com/opinion/max-lucado-fearless-parenting">https://www.foxnews.com/opinion/max-lucado-fearless-parenting</a>
<a href="https://www.foxnews.com/auto/fiat-chrysler-sales-boss-reid-bigland-sues-company-for-violating-whistleblower-protections">https://www.foxnews.com/auto/fiat-chrysler-sales-boss-reid-bigland-sues-company-for-violating-whistleblower-protections</a>	<a href="https://www.foxnews.com/auto/electric-ford-mustang-lithium">https://www.foxnews.com/auto/electric-ford-mustang-lithium</a>

Virus:

Lucene	PageRank
<a href="https://www.foxnews.com/tech/computer-virus-cripples-tribune-publishing-los-angeles-times">https://www.foxnews.com/tech/computer-virus-cripples-tribune-publishing-los-angeles-times</a>	<a href="https://www.foxnews.com/science">https://www.foxnews.com/science</a>
<a href="https://www.foxnews.com/science/deadly-seal-virus-spreading-melting-arctic-ice">https://www.foxnews.com/science/deadly-seal-virus-spreading-melting-arctic-ice</a>	<a href="https://www.foxnews.com/category/science/planet-earth">https://www.foxnews.com/category/science/planet-earth</a>
<a href="https://www.foxnews.com/health/connecticut-bird-mosquito-eee-death">https://www.foxnews.com/health/connecticut-bird-mosquito-eee-death</a>	<a href="https://www.foxnews.com/category/science/wild-nature">https://www.foxnews.com/category/science/wild-nature</a>
<a href="https://www.foxnews.com/category/tech/topics/virus">https://www.foxnews.com/category/tech/topics/virus</a>	<a href="https://www.foxnews.com/category/tech/topics/computers">https://www.foxnews.com/category/tech/topics/computers</a>
<a href="https://www.foxnews.com/health/eee-eastern-equine-encephalitis-massachusetts-man-killed">https://www.foxnews.com/health/eee-eastern-equine-encephalitis-massachusetts-man-killed</a>	<a href="https://www.foxnews.com/science/deadly-seal-virus-spreading-melting-arctic-ice">https://www.foxnews.com/science/deadly-seal-virus-spreading-melting-arctic-ice</a>
<a href="https://www.foxnews.com/health/what-is-norovirus-3-things-to-know-about-the-vomit-inducing-bug">https://www.foxnews.com/health/what-is-norovirus-3-things-to-know-about-the-vomit-inducing-bug</a>	<a href="https://www.foxnews.com/science/sandra-orangutan-legal-personhood-new-home-florida">https://www.foxnews.com/science/sandra-orangutan-legal-personhood-new-home-florida</a>
<a href="https://www.foxnews.com/health/pregnant-women-who-get-flu-shot-are-less-likely-to-be-hospitalized-from-virus-cdc-says">https://www.foxnews.com/health/pregnant-women-who-get-flu-shot-are-less-likely-to-be-hospitalized-from-virus-cdc-says</a>	<a href="https://www.foxnews.com/science/ancient-shipwrecks-stone-pyramid-anchors-discovered-greek-island">https://www.foxnews.com/science/ancient-shipwrecks-stone-pyramid-anchors-discovered-greek-island</a>
<a href="https://www.foxnews.com/health/flu-season-2019-vaccine">https://www.foxnews.com/health/flu-season-2019-vaccine</a>	<a href="https://www.foxnews.com/science/earths-mantle-and-crust-are-in-a-fiery-battle-to-the-death-of-supercontinents">https://www.foxnews.com/science/earths-mantle-and-crust-are-in-a-fiery-battle-to-the-death-of-supercontinents</a>
<a href="https://www.foxnews.com/category/health/infectious-disease/zika">https://www.foxnews.com/category/health/infectious-disease/zika</a>	<a href="https://www.foxnews.com/science/mammoth-traps-prehistoric-mexico">https://www.foxnews.com/science/mammoth-traps-prehistoric-mexico</a>
<a href="https://www.foxnews.com/health/british-mom-son-flu">https://www.foxnews.com/health/british-mom-son-flu</a>	<a href="https://www.foxnews.com/science/mercury-transit-2019-what-to-know">https://www.foxnews.com/science/mercury-transit-2019-what-to-know</a>

### 5) An overlap graph

Query	Overlap Num
Cannes	4
Congress	0
Democrats	0
Patriot Movement	0
Republicans	0
Senate	0
Olympics 2020	0
Stock	1
Virus	1

Overlap Num vs. Query

