Assignment 4 Report

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1. **Steps to complete the assignment**

   1) Download binary released solr and unzip it from given link and use command **'bin/solr start'** to start solr;

   2) Create a core named **myexample** on solr using command **'bin/solr create -c myexample'**;

   3) Modify the config fille in my solr core folder named **managed-schema** as below:

      <field name="_root_" type="string" docValues="false" indexed="true" stored="false"/>

      <field name="_text_" type="text_general" multiValued="true" indexed="true" stored="false"/>

      <field name="_version_" type="plong" indexed="false" stored="false"/>

      <copyField source="*" dest="_text_"/>

   4) Indexing the HTML files in solr, using command 'bin/post -c myexample - filetypes html <path_to_html_files>'. For me, the command is 'bin/post -c myexample -filetypes html /Users/lacticacid/Desktop/2018\ Fall/CSCI\ 572/Homework/4/mercurynews/mercurynews_html_files';

   5) Open solr UI on browser via http://localhost:8983, use the query "*:*" and successfully got the expected results;

   6) Download MAMP for running my PHP webpage;

   7) Clone the solr-php-client repository on my computer and use it when developing the user interface;

   8) Create a folder named csci572-hw4 under /Applications/MAMP/htdocs/, copy solr-php-client/Apache/Solr/Service.php to this folder, create a php file named index.php, modify the codes to provide the query box, option radio-buttons and a submit button;

9) Write Java codes in Eclipse with JSOUP library to get all the outgoing links in HTML pages and then create a edgelist file. Use this file as the input for calculating the pageranks;

10) Write Python codes in Sublime with networkx library to generate the graph using the edgelist file we got from last step and also calculate the pagerank values based on the graph. The configuration of Pagerank algorithm I used in the Python code is: **alpha=0.85, personalization=None, max_iter=30, tol=1e-06, nstart=None, weight='weight', dangling=None**. Save pagerank values in a file named "external_pageRankFile.txt";

11) Copy the pagerank file to the data folder of my core—myexample;

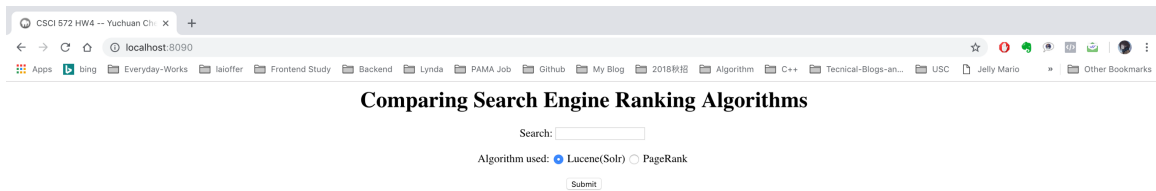12) Modify the config file—managed-schema by adding the field as instructed:
    <fieldType name="external" keyField="id" defVal="0"
    class="solr.ExternalFileField"/>
    <field name="pageRankFile" type="external" stored="false"
    indexed="false"/>

13) Reload Solr in Solr admin;

14) Open the query webpage via http://localhost:8090, and successfully get the results;

2. **Explanation regarding why some pages have higher PageRank values than others.**
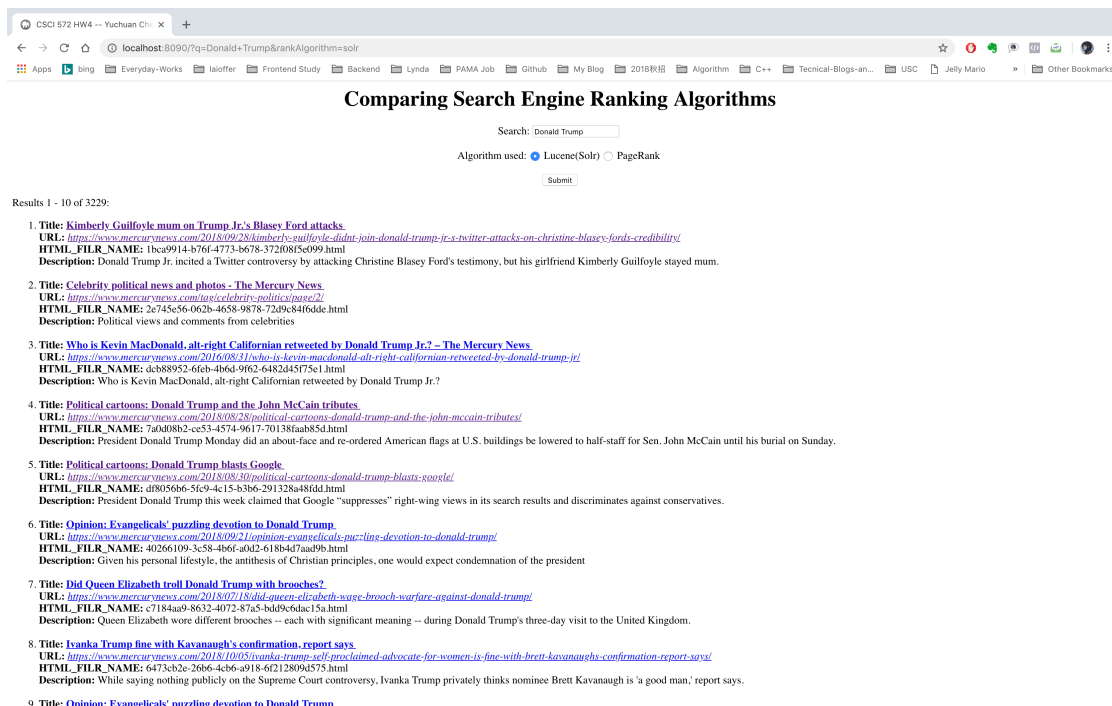
PageRank works by counting the number and quality of links to a page to determine a rough estimate of how important the website is. The underlying assumption is that more important websites are likely to receive more links from other websites. For example, https://www.mercurynews.com/tag/cartoons/, which is reachable from many other web pages, it has the higher PageRank value. If a page can be reached from more pages, it will have a higher indegrees and thus, it will have a higher PageRank value.
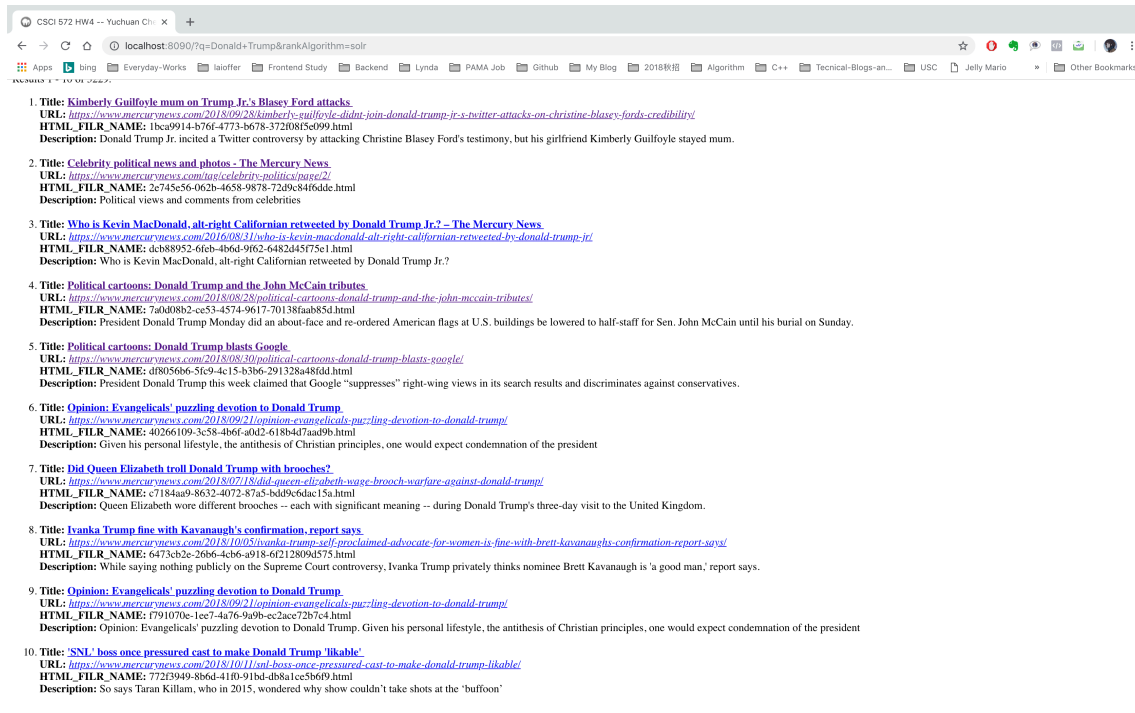
3. **Screenshots**

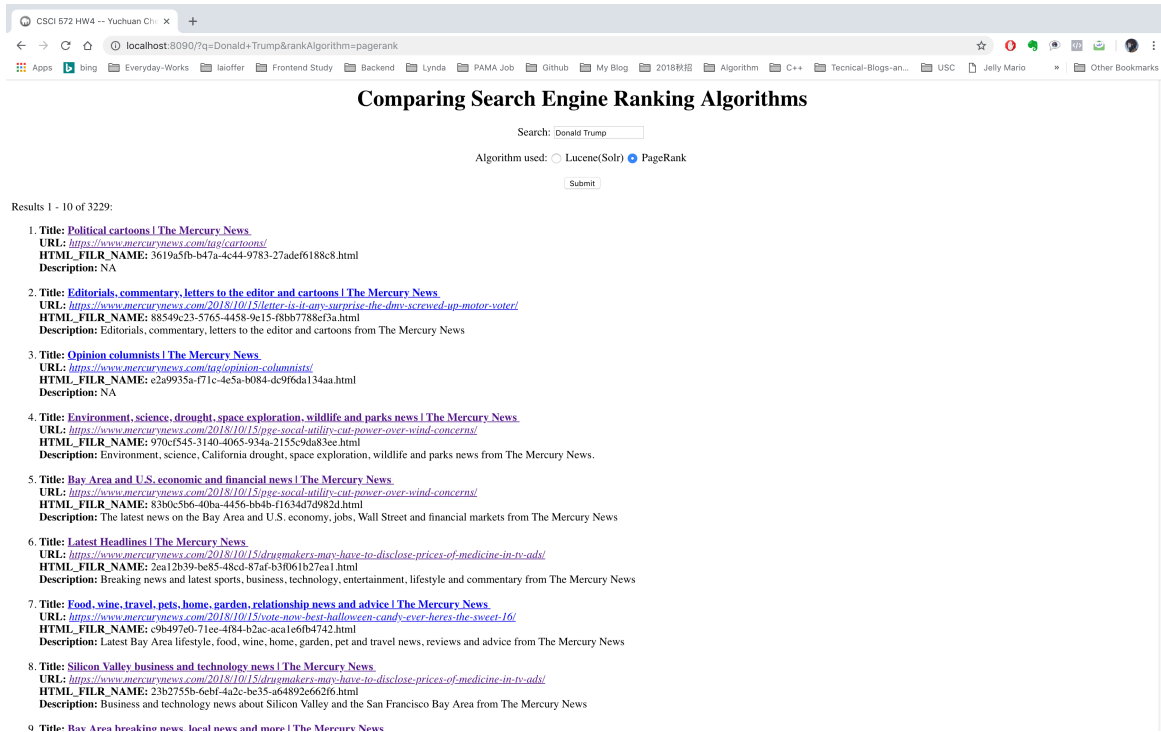• Screenshot of initial page where you enter the query in input box.

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

Results 1 - 10 of 3229:

1. Title: **Kimberly Guilfoyle mum on Trump Jr.'s Blasey Ford attacks**
   URL: *https://www.mercurynews.com/2018/09/28/kimberly-guilfoyle-didnt-join-donald-trump-jr-s-twitter-attacks-on-christine-blasey-fords-credibility/*
   HTML_FILR_NAME: 1bca9914-b76f-4773-b678-372f08f5e099.html
   Description: Donald Trump Jr. incited a Twitter controversy by attacking Christine Blasey Ford's testimony, but his girlfriend Kimberly Guilfoyle stayed mum.

2. Title: **Celebrity political news and photos - The Mercury News**
   URL: *https://www.mercurynews.com/tag/celebrity-politics/page/2/*
   HTML_FILR_NAME: 2e745e56-062b-4658-9878-72d9c84f6dde.html
   Description: Political views and comments from celebrities

3. Title: **Who is Kevin MacDonald, alt-right Californian retweeted by Donald Trump Jr.? – The Mercury News**
   URL: *https://www.mercurynews.com/2016/08/31/who-is-kevin-macdonald-alt-right-californian-retweeted-by-donald-trump-jr/*
   HTML_FILR_NAME: dcb88952-6feb-4b6d-9f62-6482d45f75e1.html
   Description: Who is Kevin MacDonald, alt-right Californian retweeted by Donald Trump Jr.?

4. Title: **Political cartoons: Donald Trump and the John McCain tributes**
   URL: *https://www.mercurynews.com/2018/08/28/political-cartoons-donald-trump-and-the-john-mccain-tributes/*
   HTML_FILR_NAME: 7a0d08b2-ce53-4574-9617-70138faab85d.html
   Description: President Donald Trump Monday did an about-face and re-ordered American flags at U.S. buildings be lowered to half-staff for Sen. John McCain until his burial on Sunday.

5. Title: **Political cartoons: Donald Trump blasts Google**
   URL: *https://www.mercurynews.com/2018/08/30/political-cartoons-donald-trump-blasts-google/*
   HTML_FILR_NAME: df8056b6-5fc9-4c15-b3b6-291328a48fdd.html
   Description: President Donald Trump this week claimed that Google "suppresses" right-wing views in its search results and discriminates against conservatives.

6. Title: **Opinion: Evangelicals' puzzling devotion to Donald Trump**
   URL: *https://www.mercurynews.com/2018/09/21/opinion-evangelicals-puzzling-devotion-to-donald-trump/*
   HTML_FILR_NAME: 40266109-3c58-4b6f-a0d2-618b4d7aad9b.html
   Description: Given his personal lifestyle, the antithesis of Christian principles, one would expect condemnation of the president

7. Title: **Did Queen Elizabeth troll Donald Trump with brooches?**
   URL: *https://www.mercurynews.com/2018/07/18/did-queen-elizabeth-wage-brooch-warfare-against-donald-trump/*
   HTML_FILR_NAME: c7184aa9-8632-4072-87a5-bdd9c6dac15a.html
   Description: Queen Elizabeth wore different brooches -- each with significant meaning -- during Donald Trump's three-day visit to the United Kingdom.

8. Title: **Ivanka Trump fine with Kavanaugh's confirmation, report says**
   URL: *https://www.mercurynews.com/2018/10/05/ivanka-trump-self-proclaimed-advocate-for-women-is-fine-with-brett-kavanaughs-confirmation-report-says/*
   HTML_FILR_NAME: 6473cb2e-26b6-4cb6-a918-6f212809d575.html
   Description: While saying nothing publicly on the Supreme Court controversy, Ivanka Trump privately thinks nominee Brett Kavanaugh is 'a good man,' report says.

9. Title: **Opinion: Evangelicals' puzzling devotion to Donald Trump**
   URL: *https://www.mercurynews.com/2018/09/21/opinion-evangelicals-puzzling-devotion-to-donald-trump/*
   HTML_FILR_NAME: f791070e-1ee7-4a76-9a9b-ec2ace72b7c4.html
   Description: Opinion: Evangelicals' puzzling devotion to Donald Trump. Given his personal lifestyle, the antithesis of Christian principles, one would expect condemnation of the president

10. Title: **'SNL' boss once pressured cast to make Donald Trump 'likable'**
    URL: *https://www.mercurynews.com/2018/10/11/snl-boss-once-pressured-cast-to-make-donald-trump-likable/*
    HTML_FILR_NAME: 772f3949-8b6d-41f0-91bd-db8a1ce5b6f9.html
    Description: So says Taran Killam, who in 2015, wondered why show couldn't take shots at the 'buffoon'

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

Comparing Search Engine Ranking Algorithms

Search: Donald Trump

Algorithm used: ○ Lucene(Solr) ● PageRank

Submit

Results 1 - 10 of 3229:

1. Title: **Political cartoons | The Mercury News**
   URL: *https://www.mercurynews.com/tag/cartoons/*
   HTML_FILR_NAME: 3619a5fb-b47a-4c44-9783-27adef6188c8.html
   Description: NA

2. Title: **Editorials, commentary, letters to the editor and cartoons | The Mercury News**
   URL: *https://www.mercurynews.com/2018/10/15/letter-is-it-any-surprise-the-dmv-screwed-up-motor-voter/*
   HTML_FILR_NAME: 88549c23-5765-4458-9e15-f8bb7788ef3a.html
   Description: Editorials, commentary, letters to the editor and cartoons from The Mercury News

3. Title: **Opinion columnists | The Mercury News**
   URL: *https://www.mercurynews.com/tag/opinion-columnists/*
   HTML_FILR_NAME: e2a9935a-f71c-4e5a-b084-dc9f6da134aa.html
   Description: NA

4. Title: **Environment, science, drought, space exploration, wildlife and parks news | The Mercury News**
   URL: *https://www.mercurynews.com/2018/10/15/pge-socal-utility-cut-power-over-wind-concerns/*
   HTML_FILR_NAME: 970cf545-3140-4065-934a-2155c9da83ee.html
   Description: Environment, science, California drought, space exploration, wildlife and parks news from The Mercury News.

5. Title: **Bay Area and U.S. economic and financial news | The Mercury News**
   URL: *https://www.mercurynews.com/2018/10/15/pge-socal-utility-cut-power-over-wind-concerns/*
   HTML_FILR_NAME: 83b0c5b6-40ba-4456-bb4b-f1634d7d982d.html
   Description: The latest news on the Bay Area and U.S. economy, jobs, Wall Street and financial markets from The Mercury News

6. Title: **Latest Headlines | The Mercury News**
   URL: *https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/*
   HTML_FILR_NAME: 2ea12b39-be85-48cd-87af-b3f061b27ea1.html
   Description: Breaking news and latest sports, business, technology, entertainment, lifestyle and commentary from The Mercury News

7. Title: **Food, wine, travel, pets, home, garden, relationship news and advice | The Mercury News**
   URL: *https://www.mercurynews.com/2018/10/15/vote-now-back-halloween-candy-ever-heres-the-sweet-16/*
   HTML_FILR_NAME: c9b497e0-71ee-4f84-b2ac-aca1e6fb4742.html
   Description: Latest Bay Area lifestyle, food, wine, home, garden, pet and travel news, reviews and advice from The Mercury News

8. Title: **Silicon Valley business and technology news | The Mercury News**
   URL: *https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/*
   HTML_FILR_NAME: 23b2755b-6ebf-4a2c-be35-a64892e662f6.html
   Description: Business and technology news about Silicon Valley and the San Francisco Bay Area from The Mercury News

9. Title: **Bay Area breaking news, local news and more | The Mercury News**

1. **Title:** Political cartoons | The Mercury News
   URL: *https://www.mercurynews.com/tag/cartoons/*
   HTML_FILR_NAME: 3619a5fb-b47a-4c44-9783-27adef6188c8.html
   Description: NA

2. **Title:** Editorials, commentary, letters to the editor and cartoons | The Mercury News
   URL: *https://www.mercurynews.com/2018/10/15/letter-is-it-any-surprise-the-dmv-screwed-up-motor-voter/*
   HTML_FILR_NAME: 88549c23-5765-4458-9e15-f8bb7788ef3a.html
   Description: Editorials, commentary, letters to the editor and cartoons from The Mercury News

3. **Title:** Opinion columnists | The Mercury News
   URL: *https://www.mercurynews.com/tag/opinion-columnists/*
   HTML_FILR_NAME: e2a9935a-f71c-4e5a-b084-dc9f6da134aa.html
   Description: NA

4. **Title:** Environment, science, drought, space exploration, wildlife and parks news | The Mercury News
   URL: *https://www.mercurynews.com/2018/10/15/pge-socal-utility-cut-power-over-wind-concerns/*
   HTML_FILR_NAME: 970cf545-3140-4065-934a-2155c9da83ee.html
   Description: Environment, science, California drought, space exploration, wildlife and parks news from The Mercury News.

5. **Title:** Bay Area and U.S. economic and financial news | The Mercury News
   URL: *https://www.mercurynews.com/2018/10/15/pge-socal-utility-cut-power-over-wind-concerns/*
   HTML_FILR_NAME: 83b0c5b6-40ba-4456-bb4b-f1634d7d982d.html
   Description: The latest news on the Bay Area and U.S. economy, jobs, Wall Street and financial markets from The Mercury News

6. **Title:** Latest Headlines | The Mercury News
   URL: *https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/*
   HTML_FILR_NAME: 2ea12b39-be85-48cd-87af-b3f061b27ea1.html
   Description: Breaking news and latest sports, business, technology, entertainment, lifestyle and commentary from The Mercury News

7. **Title:** Food, wine, travel, pets, home, garden, relationship news and advice | The Mercury News
   URL: *https://www.mercurynews.com/2018/10/15/vote-now-best-halloween-candy-ever-heres-the-sweet-16/*
   HTML_FILR_NAME: c9b497e0-71ee-4f84-b2ac-aca1e6fb4742.html
   Description: Latest Bay Area lifestyle, food, wine, home, garden, pet and travel news, reviews and advice from The Mercury News

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   URL: *https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/*
   HTML_FILR_NAME: 23b2755b-6ebf-4a2c-be35-a64892e662f6.html
   Description: Business and technology news about Silicon Valley and the San Francisco Bay Area from The Mercury News

9. **Title:** Bay Area breaking news, local news and more | The Mercury News
   URL: *https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/*
   HTML_FILR_NAME: c227a98e-8aec-43a8-86de-cc3266f1528a.html
   Description: The Mercury News is the leading source of breaking news, local news, business, sports, politics and more in San Jose, California and beyond

10. **Title:** Bay Area entertainment and celebrity news | The Mercury News
    URL: *https://www.mercurynews.com/2018/10/15/here-are-the-odds-on-the-name-of-meghan-markle-and-prince-harrys-baby/*
    HTML_FILR_NAME: 681f010c-3178-4047-9edf-16aeb5947d72.html
    Description: Latest music, movie, concerts and TV news and reviews plus celebrity news and photos from The Mercury News

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

The Mercury News

WEATHER
TODAY'S E EDITION
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TRENDING: Woolsey and Hill fires   Celeb homes burn   Cheesy Bacon Fries   Markle bridezilla   Big new hotel in SJ   Mueller demonstrations

BREAKING NEWS | Camp Fire: At least 9 dead, more fatalities expected   ✕

Celebrity Politics

HBO ticked off at Trump for 'misuse' of 'Game of Thrones' imagery
By Chuck Barney
November 02, 2018, 12:07 pm

Melania Trump racked up $95,000 hotel bill for 6-hour Cairo visit
By Martha Ross
November 02, 2018, 8:23 am

Neil Young confirms marriage to Daryl Hannah in a get-out-the-vote message
By Martha Ross
November 01, 2018, 9:31 am

Did Kim Kardashian push Kanye West to finally shut up about Trump?
By Martha Ross
October 31, 2018, 12:14 pm

Rare Jackie Kennedy love letter to JFK reveals her longing for errant

4. URL List Table

- Donald Trump

Luncene	PageRank
https://www.mercurynews.com/2018/09/28/kimberly-guilfoyle-didnt-join-donald-trump-jr-s-twitter-attacks-on-christine-blasey-fords-credibility/	https://www.mercurynews.com/tag/cartoons/
https://www.mercurynews.com/tag/celebrity-politics/page/2/	https://www.mercurynews.com/2018/10/15/letter-is-it-any-surprise-the-dmv-screwed-up-motor-voter/
https://www.mercurynews.com/2016/08/31/who-is-kevin-macdonald-alt-right-californian-retweeted-by-donald-trump-jr/	https://www.mercurynews.com/tag/opinion-columnists/
https://www.mercurynews.com/2018/08/28/political-cartoons-donald-trump-and-the-john-mccain-tributes/	https://www.mercurynews.com/2018/10/15/pge-socal-utility-cut-power-over-wind-concerns/
https://www.mercurynews.com/2018/08/30/political-cartoons-donald-trump-blasts-google/	https://www.mercurynews.com/2018/10/15/pge-socal-utility-cut-power-over-wind-concerns/
https://www.mercurynews.com/2018/09/21/opinion-evangelicals-puzzling-devotion-to-donald-trump/	https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/
https://www.mercurynews.com/2018/07/18/did-queen-elizabeth-wage-brooch-warfare-against-donald-trump/	https://www.mercurynews.com/2018/10/15/vote-now-best-halloween-candy-ever-heres-the-sweet-16/
https://www.mercurynews.com/2018/10/05/ivanka-trump-self-proclaimed-advocate-for-women-is-fine-with-brett-kavanaughs-confirmation-report-says/	https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/
https://www.mercurynews.com/2018/09/21/opinion-evangelicals-puzzling-devotion-to-donald-trump/	https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/
https://www.mercurynews.com/2018/10/11/snl-boss-once-pressured-cast-to-make-donald-trump-likable/	https://www.mercurynews.com/2018/10/15/here-are-the-odds-on-the-name-of-meghan-markle-and-prince-harrys-baby/

- LA Lakers

Luncene	PageRank

https://www.mercurynews.com/2018/05/06/nba-playoffs-2018-golden-state-warriors-kevin-durant-game-4-highlights-video-new-orleans-pelicans-stephen-curry-score-schedule-time/	https://www.mercurynews.com/2018/10/15/heres-how-the-warriors-can-make-opening-night-a-success/
https://www.mercurynews.com/2017/12/06/6-acre-brentwood-brush-fire-burning-uphill-near-skirball-center/	https://www.mercurynews.com/2018/10/15/heralded-stage-phenomenon-barber-shop-chronicles-comes-to-sf-bay-area/
https://www.mercurynews.com/2018/05/05/nba-playoffs-2018-golden-state-warriors-new-orleans-pelicans-game-schedule-channel-stream-draymond-green-gsw-stephen-curry-rajon-rondo/	https://www.mercurynews.com/2018/10/09/and-kerri-walsh-jennings-new-partner-is-beach-star-gets-defensive/
https://www.mercurynews.com/2018/05/07/nba-playoffs-2018-golden-state-warriors-new-orleans-pelicans-andre-iguodala-draymond-green-hamptons-five-5-death-lineup-schedule-time-gsw/	https://www.mercurynews.com/2018/10/15/heres-how-the-warriors-can-make-opening-night-a-success/
https://www.mercurynews.com/tag/warriors-live/	https://www.mercurynews.com/2018/10/15/prep-football-rankings-week-10-bay-area-news-group-top-25/
https://www.mercurynews.com/2018/05/08/golden-state-warriors-new-orleans-pelicans-houston-rockets-stream-time-channel-nba-playoffs-2018-western-conference-finals-kevin-durant/	https://www.mercurynews.com/2018/10/14/oakland-raiders-jon-gruden-derek-carr-news-seattle-seahawks-nfl-london-fire-contract-salary-years-roster-las-vegas-stadium-schedule/
https://www.mercurynews.com/2018/01/22/jason-kidd-fired-as-milwaukee-bucks-head-coach/	https://www.mercurynews.com/2018/10/15/here-are-the-odds-on-the-name-of-meghan-markle-and-prince-harrys-baby/
https://www.mercurynews.com/2018/10/12/live-preseason-updates-warriors-vs-lakers-friday-at-730-p-m/	https://www.mercurynews.com/2018/10/15/sponsored-one-of-a-kind-fresh-renovated-orinda-home-with-mt-diablo-and-hillside-views/
https://www.mercurynews.com/2018/10/13/golden-state-warriors-vs-los-angeles-lakers-highlights-video-lebron-james-news-contract-salary-rumors-stephen-curry-twitter-steve-kerr/	https://www.mercurynews.com/2018/10/15/kim-kardashian-promoted-mental-health-during-google-visit-but-what-about-unhinged-kanye-west/

https://www.mercurynews.com/2018/10/15/here-s-how-the-warriors-can-make-opening-night-a-success/	https://www.mercurynews.com/2018/10/15/paul-allen-microsoft-co-founder-seahawks-owner-dead-at-65/

- Star Wars

Luncene	PageRank
https://www.mercurynews.com/tag/star-wars/	https://www.mercurynews.com/2018/10/15/heres-how-the-warriors-can-make-opening-night-a-success/
https://www.mercurynews.com/2017/12/14/fans-line-up-for-star-wars-the-last-jedi-at-the-tech-museum/	https://www.mercurynews.com/2018/10/15/top-20-foodie-cities/
https://www.mercurynews.com/2018/10/08/disney-land-star-wars-galaxys-edge-preview/	https://www.mercurynews.com/2018/10/15/vote-now-best-halloween-candy-ever-heres-the-sweet-16/
https://www.mercurynews.com/2018/10/08/disney-land-star-wars-galaxys-edge-preview/	https://www.mercurynews.com/2018/10/09/and-kerri-walsh-jennings-new-partner-is-beach-star-gets-defensive/
http://www.ocregister.com/disneyland-will-sell-alcohol-for-the-first-time-when-star-wars-land-opens-in-2019	https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/
http://www.ocregister.com/disneyland-is-quietly-removing-seating-and-planters-for-star-wars-land-access	https://www.mercurynews.com/2018/10/15/vote-now-best-halloween-candy-ever-heres-the-sweet-16/
https://www.mercurynews.com/2018/08/01/star-wars-filmmaker-j-j-abrams-sends-his-first-ever-tweet-heres-what-it-said/	https://www.mercurynews.com/2018/10/15/49ers-packers-pregame-te-dwelley-added-green-bay-missing-wrs/
https://www.mercurynews.com/2018/08/22/star-wars-actress-defies-racists-with-return-to-instagram/	https://www.mercurynews.com/2018/10/15/heres-how-the-warriors-can-make-opening-night-a-success/
https://www.mercurynews.com/2018/10/15/17-ways-to-save-money-on-a-trip-to-disneyland/	https://www.mercurynews.com/2018/10/08/san-jose-earthquakes-hire-big-time-coach/
http://www.ocregister.com/disneyland-is-quietly-removing-seating-and-planters-for-star-wars-land-access	https://www.mercurynews.com/2018/10/15/here-are-the-odds-on-the-name-of-meghan-markle-and-prince-harrys-baby/

- Lebron James

Luncene	PageRank
https://www.mercurynews.com/tag/lebron-james/page/2/	https://www.mercurynews.com/location/california/bay-area/east-bay/alameda-county/
https://www.mercurynews.com/tag/lebron-james/	https://www.mercurynews.com/2018/10/15/heres-how-the-warriors-can-make-opening-night-a-success/
https://www.mercurynews.com/2018/08/04/president-trump-rips-lebron-james-says-i-like-mike/	https://www.mercurynews.com/2018/10/15/drugmakers-may-have-to-disclose-prices-of-medicine-in-tv-ads/
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- Hurricane Florence

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- Paul Allen

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5. Overlap graph

Query	Overlap
Donald Trump	0
LA Lakers	1
Star Wars	0
Lebron James	0
2018 World Cup	0
North Korea	0
Hurricane Florence	0
Paul Allen	2

Overlap