

Steps Taken to Complete the assignmentSystem Details:

NAME="Ubuntu" VERSION="18.04.5 LTS (Bionic Beaver)" ID=ubuntu ID_LIKE=debian
Intel Core i7 Processor , 16GB RAM, Drive Size: 1TB

Installation:

- Installation of Java, Apache and PH

Installed JAVA Version: v11.0.1

Installed Apache v2.4.29

Installed PHP v7.2.24

- Installation of Solr-7.7.3

Downloaded Solr-7.7.3 from <https://downloads.apache.org/lucene/solr/7.7.3/solr-7.7.3.zip>

Create a core "myexample"

Configured Solr to query default from `_text_` by defining the `df` field inside requestHandler of `solrconfig.xml` file

- Used TIKA POST Command, fetched and parsed 26724 documents. Indexed entries for 19193 documents.

Screenshot of Solr-admin showing the results for `*:*` query:

The screenshot shows the Solr Admin web interface in a Firefox browser. The address bar shows the URL `localhost:8983/solr/#/myexample/query`. The interface is divided into a left sidebar with navigation links (Dashboard, Logging, Core Admin, Java Properties, Thread Dump, Overview, Analysis, Dataimport, Documents, Files, Ping (30ms), Plugins / Stats, Query, Replication, Schema, Segments info) and a main content area. The main content area has a 'Request-Handler (qt)' dropdown set to `/select`. Below this, there are input fields for `q` (containing `*Cannes*`), `fq`, `sort`, `start, rows` (set to 0, 10), `fl`, `df`, and `Raw Query Parameters` (containing `key1=val1&key2=val2`). There are also checkboxes for `wt` (set to `json`), `indent off`, `debugQuery`, `dismax`, `edismax`, and `hl`. The right side of the interface displays the JSON response for the query `http://localhost:8983/solr/myexample/select?q=*Cannes*`. The response includes a `responseHeader` with `status:0`, `QTime:128`, and `params`. The `response` object contains `numFound:149`, `start:0`, and a list of documents. One document is shown with fields like `id`, `og_image`, `og_image_width`, `twitter_card`, `brightspot_cached`, `stream_content_type`, `og_site_name`, `description`, `og_image_type`, `title`, `og_description`, `twitter_creator`, `twitter_image`, `twitter_image_alt`, `twitter_site`, `dc_title`, `content_encoding`, `content_type`, `stream_size`, `x_parsed_by`, `org.apache.tika.parser.DefaultParser`, `org.apache.tika.parser.html.HtmlParser`, `og_image_alt`, and `og_type`.

- Creation of EdgeList:

Used Jsoup Library, parsed the documents in JAVA to extract the Outgoing links and created an edgelist.txt file(Containing only those links present in the mapping file).

- Calculating of PageRanks:

As recommended in the assignment, I used NetworkX Python Library to create a Directional Graph using Document-ids as Nodes and edges from edgelist.txt file.

Calculated the Page Rank of the documents using PageRank function of the DiGraph.

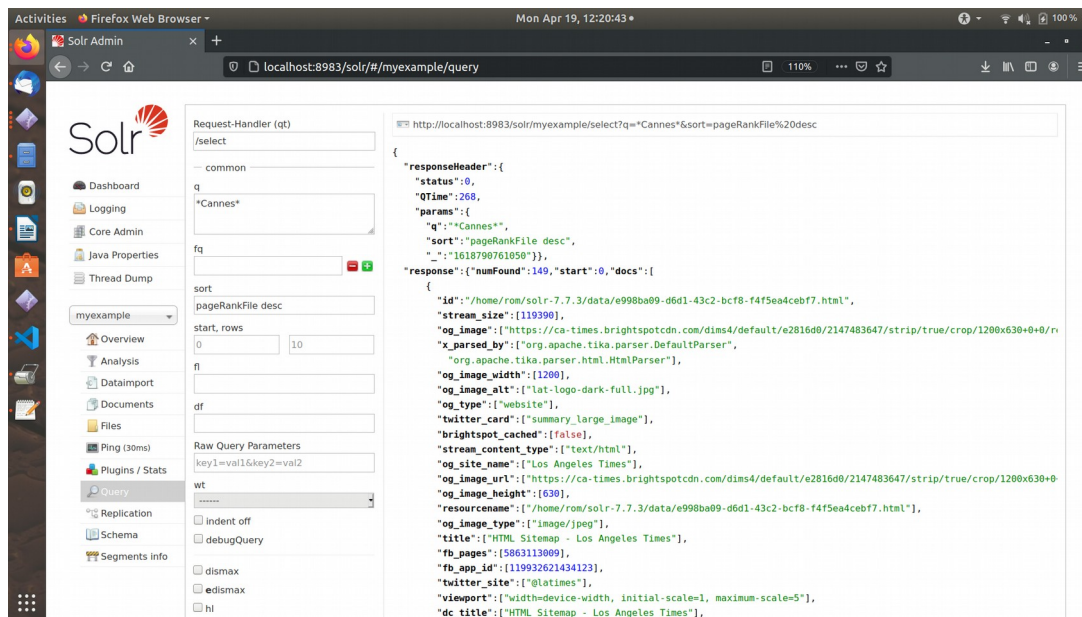
The configuration was set as follows:

- a) Damping factor was set to the default value 0.85. ($\alpha=0.85$)
- b) Node personalization was not used. (personalization = None)
- c) Max-iterations was set to 30. (max_iter = 30)
- d) Error tolerance was set at 10^{-6} . (tol = 1e-06)
- e) No starting value was given to the pages.(nstart=None)
- f) Weights correspond to the edges.(weight='weight')

- Generated external_pageRankFile.txtfile and placed it in the data folder of the Solr Core.
- Added a field-type and a field entry in the managed schema to refer the PageRank score while querying.
- Defined listeners in solrconfig.xml file to reload the external file when either a searcher is loaded or started.

Restarted Solr using ./bin/solr restart

Screenshot of Solr-admin showing the results for *:~ query sort= pageRankFile desc:

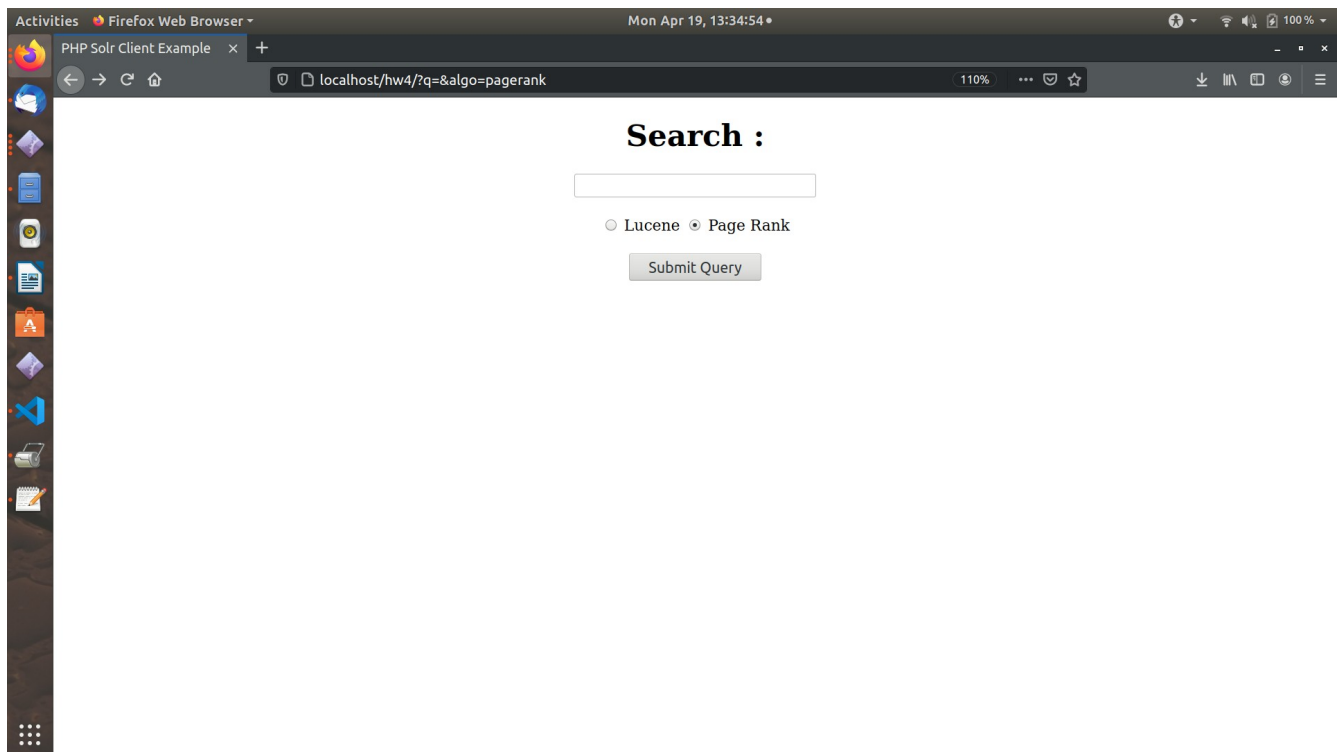


Difference in Page Ranks of different documents:

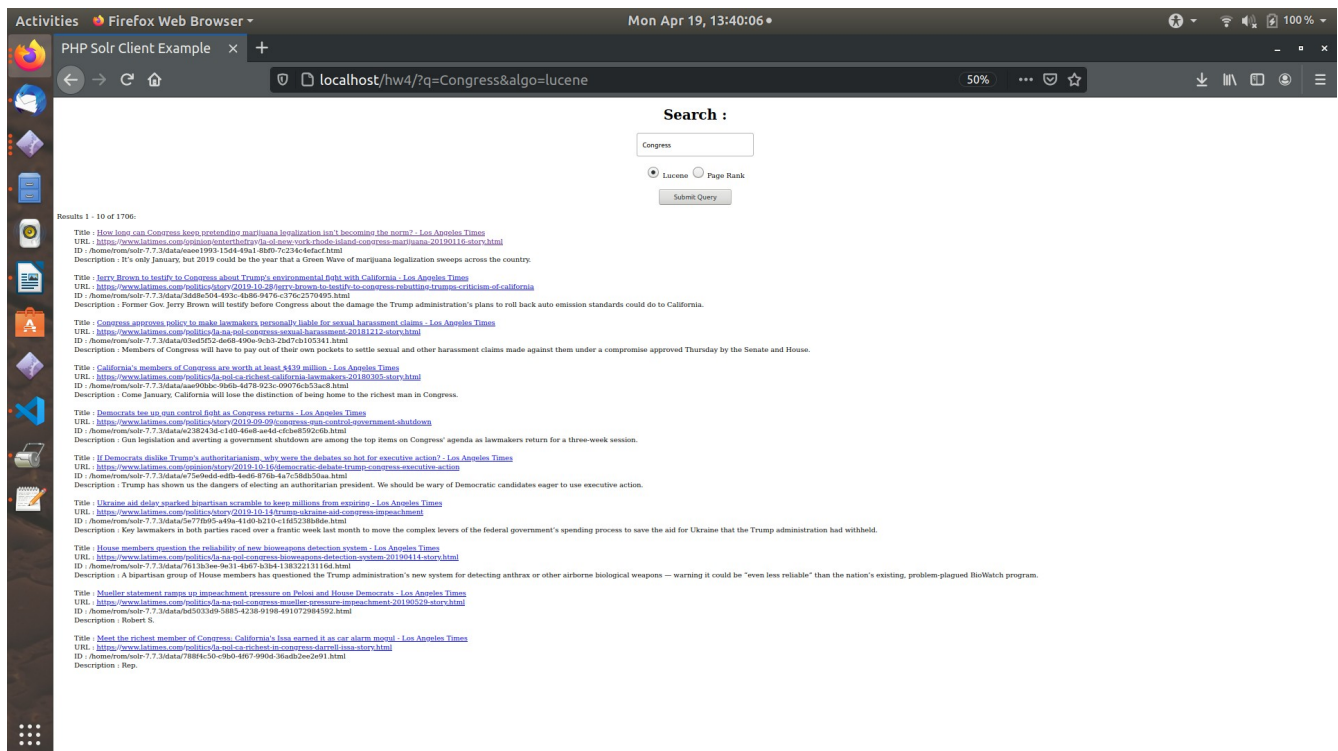
Page Rank algorithm uses the number of incoming links from other web pages to decide the Page Rank scores. Since many homepages and category pages have a number of links which point to them, we observe that they show a greater page rank score, in spite of not being very relevant to the actual query itself. Combining this Page Rank Value with other scores like TF-IDF yields more relevant results. Because of this, since Page Rank concentrates on the number of links, it does not produce good results when compared to Lucene. Lucene thus performs better and produces more relevant results when compared to our Page Rank Algorithm. As a result, when we compare the ranks produced by Page Rank and Lucene the results differ, since both the algorithms assign a different page rank score to each document.

Screenshots:

Initial Search Page



Querying "Congress" using Lucene



A screenshot of a web browser window. The address bar shows 'localhost/hw4/?q=Congress&algo=pagerank'. The page title is 'Search :'. Below the title is a search input field containing the word 'Congress'. To the right of the input field are two radio buttons: 'Lucene' (selected) and 'Page Rank'. Below these is a 'Submit Query' button. The search results are displayed in a list format, showing the title, URL, ID, and description for each result. The results are numbered 1 through 10. The first result is titled 'Option - Los Angeles Times' and the second is 'Politics - Los Angeles Times'. The third result is titled 'Michael Bloomberg files names for presidential primary - Los Angeles Times'. The fourth result is titled 'Option, Lisa and conspiracy theories drive Facebook profiles - Los Angeles Times'. The fifth result is titled 'Elizabeth Warren look down on Obama nominees - Was it for nothing? - Los Angeles Times'. The sixth result is titled 'Option, Devin Nunes wants impeachment focus on 2019 - not Trump - Los Angeles Times'. The seventh result is titled 'Trump like Mammoth event control of Forest Service recreation - Los Angeles Times'. The eighth result is titled 'Steve Bannon says Roger Stone was Trump campaign link to WikiLeaks - Los Angeles Times'. The ninth result is titled 'Option, What else will Trump do before GOP supports impeachment? - Los Angeles Times'. The tenth result is titled 'White House official saw Giuliani as a 'hand grenade' who would 'blow everybody up' - Los Angeles Times'.

Activities

Firefox Web Browser

Mon Apr 19, 13:41:53 •

100 %

How long can Congress ...

https://www.latimes.com/opinion/enterthefray/la-ol-new-york-rhode-island-congress-marijua 67% ...

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OPINION

How long can Congress keep pretending marijuana legalization isn't becoming the norm?



This June 5, 2017, photo shows marijuana plants in the vegetative room at a cannabis cultivator in Fairbanks, Alaska. (Associated Press)

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Mother unraveled in depression, QAnon-style conspiracies in months before she killed 3 kids

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HOUSING & HOMELESSNESS

L.A. plans nearly \$1 billion in spending to address homelessness under Garcetti plan

By KERRY CAVANAUGH | EDITORIAL WRITER

JAN. 16, 2019 4:15 AM PT

Query Results:

Cannes :

https://www.latimes.com/topic/cannes-film-festival	https://www.latimes.com/sitemap
https://www.latimes.com/entertainment/movies/la-et-mn-cannes-wrap-critics-conversation-20190526-story.html	https://www.latimes.com/espanol/entretenimiento/articulo/2019-10-04/por-fin-llega-joker-aqui-un-resumen-de-todo-el-drama-que-ha-provocado
https://www.latimes.com/entertainment/movies/moviesnow/la-et-mn-cannes-2015-winners-20150524-story.html	https://www.latimes.com/entertainment-arts/movies/story/2019-11-08/documentaries-apollo-11-the-cave-sea-of-shadows-honeyland
https://www.latimes.com/entertainment/movies/la-et-mn-cannes-film-festival-award-winners-20190525-story.html	https://www.latimes.com/lifestyle/gallery/chloe-sevignys-five-favorite-frocks
https://www.latimes.com/entertainment/movies/la-et-mn-cannes-parasite-atlantics-awards-20190526-story.html	https://www.latimes.com/topic/film-festivals
https://www.latimes.com/entertainment/movies/la-et-mn-cannes-once-upon-a-time-in-hollywood-20190522-story.html	https://www.latimes.com/topic/cannes-film-festival
https://www.latimes.com/entertainment/movies/la-ca-mn-cannes-genre-parasite-wild-goose-lake-tarantino-20190522-story.html	https://www.latimes.com/people/genaro-molina
https://www.latimes.com/entertainment/movies/la-et-mn-cannes-mektoub-my-love-intermezzo-abdellatif-kechiche-20190523-story.html	https://www.latimes.com/entertainment-arts/music/story/2019-11-06/whitney-houston-lesbian-relationship-robyn-crawford
https://www.latimes.com/entertainment/movies/la-et-mn-cannes-quentin-tarantino-once-upon-a-time-in-hollywood-20190521-story.html	https://www.latimes.com/entertainment-arts/movies/story/2019-10-31/apple-disney-hbomax-streaming-movies
https://www.latimes.com/entertainment/movies/la-et-mn-cannes-robert-eggert-the-lighthouse-robert-pattinson-20190524-story.html	https://www.latimes.com/opinion/story/2019-09-17/patt-morrison-dana-thomas-fast-fashion-environment

Congress

https://www.latimes.com/opinion/enterthefray/la-ol-new-york-rhode-island-congress-marijuana-20190116-story.html	https://www.latimes.com/opinion
https://www.latimes.com/politics/story/2019-10-28/jerry-brown-to-testify-to-congress-rebutting-trumps-criticism-of-california	https://www.latimes.com/espanol/politica
https://www.latimes.com/politics/la-na-pol-congress-sexual-harassment-20181212-story.html	https://www.latimes.com/politics/story/2019-11-08/michael-bloomberg-files-papers-for-2020-democratic-presidential-primary
https://www.latimes.com/politics/la-pol-ca-richest-california-lawmakers-20180305-story.html	https://www.latimes.com/opinion/story/2019-11-09/facebook-twitter-political-ads-lies
https://www.latimes.com/politics/story/2019-09-09/congress-gun-control-government-shutdown	https://www.latimes.com/politics/story/2019-11-08/elizabeth-warren-used-bare-knuckle-tactics-to-take-down-an-obama-nominee
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https://www.latimes.com/politics/story/2019-10-14/trump-ukraine-aid-congress-impeachment	https://www.latimes.com/environment/story/2019-11-08/eastern-sierra-towns-recreation-tourism-forest-service
https://www.latimes.com/politics/la-na-pol-congress-bioweapons-detection-system-20190414-story.html	https://www.latimes.com/politics/story/2019-11-08/steve-bannon-roger-stone-trump-campaign-wikileaks
https://www.latimes.com/politics/la-na-pol-congress-mueller-pressure-impeachment-20190529-story.html	https://www.latimes.com/opinion/story/2019-11-08/impeachment-trump-republicans-toomey
https://www.latimes.com/politics/la-pol-ca	https://www.latimes.com/politics/story/2019-

richest-in-congress-darrell-issa-story.html	11-08/alexander-vindman-fiona-hill-impeachment-transcripts
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Democrats

https://www.latimes.com/politics/story/2019-11-07/house-democrats-subpoena-mick-mulvaney-in-impeachment-probe	https://www.latimes.com/california
https://www.latimes.com/opinion/story/2019-11-05/impeachment-donald-trump-democrats-political-cost-elections	https://www.latimes.com/opinion
https://www.latimes.com/politics/story/2019-11-03/iowa-democrats-candidate-beat-trump	https://www.latimes.com/politics
https://www.latimes.com/politics/story/2019-10-17/democrats-quick-impeachment-timing-complicated	https://www.latimes.com/politics/story/2019-11-08/michael-bloomberg-files-papers-for-2020-democratic-presidential-primary
https://www.latimes.com/politics/story/2019-10-08/impeachment-trump-democrats-whistleblower-identity-testimony	https://www.latimes.com/politics/story/2019-11-08/democratic-primary-debate-moves-from-ucla-to-loyola-marymount-university
https://www.latimes.com/politics/story/2019-09-24/democrats-and-pelosi-appear-close-to-tipping-point-on-impeachment	https://www.latimes.com/politics/story/2019-11-08/elizabeth-warren-used-bare-knuckle-tactics-to-take-down-an-obama-nominee
https://www.latimes.com/politics/story/2019-09-29/trump-allies-and-democrats-reveal-the-deep-divisions-over-impeachment-inquiry	https://www.latimes.com/opinion/story/2019-11-09/elizabeth-warren-trump
https://www.latimes.com/politics/story/2019-08-01/assignment-post-debate-health-care-analysis-new-story	https://www.latimes.com/opinion/story/2019-11-09/devin-nunes-impeachment-witness-list
https://www.latimes.com/nation/ct-democrats-economic-plan-20170824-story.html	https://www.latimes.com/politics/story/2019-11-08/steve-bannon-roger-stone-trump-campaign-wikileaks
https://www.latimes.com/california/story/2019-10-21/california-independent-voters-can-cast-ballots-for-democrats-not-trump-march-2020-primary	https://www.latimes.com/opinion/story/2019-11-08/impeachment-trump-republicans-toomey

Patriot Movement

https://www.latimes.com/archives/la-xpm-2012-oct-23-la-me-russell-means-20121023-story.html	https://www.latimes.com/environment
https://www.latimes.com/staff/megan-garvey	https://www.latimes.com/science
https://www.latimes.com/archives/la-xpm-2001-jun-10-mn-8792-story.html	https://www.latimes.com/california/story/2019-11-09/prop-187-anniversary-commemoration
https://www.latimes.com/entertainment-arts/books/story/2019-10-25/shadowlands-anthony-mccann-oregon-standoff	https://www.latimes.com/entertainment-arts/story/2019-11-09/classical-music-things-to-do-in-la-this-week-nov-10-17-magic-flute-la-opera
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https://www.latimes.com/entertainment/movies/la-et-mn-july-4-box-office-history-20180629-story.html	https://www.latimes.com/topic/mexico-americas
https://www.latimes.com/entertainment/movies/la-et-mn-july-4-box-office-history-	https://www.latimes.com/topic/museums

20180629-story.html	
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Republicans

https://www.latimes.com/opinion/story/2019-10-23/house-republicans-storm-hearing-impeachment	https://www.latimes.com/
https://www.latimes.com/politics/story/2019-10-30/democrats-hoped-theyd-win-over-republicans-on-impeachment-but-its-not-looking-that-way-so-far	https://www.latimes.com/opinion
https://www.latimes.com/opinion/story/2019-11-08/impeachment-trump-republicans-toomey	https://www.latimes.com/opinion/la-letter-to-the-editor-htmlstory.html
https://www.latimes.com/politics/story/2019-10-04/vulnerable-senate-republicans-impeachment	https://www.latimes.com/opinion/story/2019-11-09/facebook-twitter-political-ads-lies
https://www.latimes.com/california/story/2019-10-16/california-republicans-democrats-wildfires-homelessness	https://www.latimes.com/opinion/story/2019-11-08/berlin-wall-30th-anniversary-cold-war-donald-trump
https://www.latimes.com/politics/story/2019-10-23/impeachment-deposition-room-stormed-by-republicans	https://www.latimes.com/politics/story/2019-11-08/elizabeth-warren-used-bare-knuckle-tactics-to-take-down-an-obama-nominee
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https://www.latimes.com/politics/story/2019-	https://www.latimes.com/opinion/story/2019-

11-06/republicans-election-trump-candidate-loses-kentucky	11-08/impeachment-trump-republicans-toomey
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Senate

https://www.latimes.com/politics/story/2019-11-07/gop-is-already-thinking-about-how-to-turn-a-senate-impeachment-trial-to-trumps-advantage	https://www.latimes.com/
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https://www.latimes.com/opinion/story/2019-10-15/wmcaleen-homeland-security-trump-nielsen-senate-acting-secretary	https://www.latimes.com/opinion/story/2019-11-09/sat-uc-college-admissions

Olympics 2020

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https://www.latimes.com/sports/olympics/story/2019-10-16/2020-tokyo-olympics-marathon-sapporo-avoid-heat	https://www.latimes.com/business
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https://www.latimes.com/sports/story/2019-11-05/ioc-anti-doping-2020-tokyo-olympics	https://www.latimes.com/world-nation
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Stock

https://www.latimes.com/business/story/2019-11-06/uber-lock-up-period-ends-with-falling-stock-protests	https://www.latimes.com/
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https://www.latimes.com/business/la-fi-uber-ipo-stock-trading-price-20190510-story.html	https://www.latimes.com/business/real-estate/story/2019-11-09/hot-property-very-brady-sale-malibu
https://www.latimes.com/business/story/2019-09-09/at-t-stock-surges-elliott-reveals-3-2-billion-stake	https://www.latimes.com/politics/story/2019-11-08/elizabeth-warren-used-bare-knuckle-tactics-to-take-down-an-obama-nominee
https://www.latimes.com/business/la-fi-stock-market-status-update-20180209-story.html	https://www.latimes.com/business/real-estate/story/2019-11-09/hot-property-newsletter-rifleman-leads-the-posse-on-a-little-mosey-down-memory-lane
https://www.latimes.com/business/la-fi-stock-market-correction-20180212-story.html	https://www.latimes.com/business/story/2019-11-09/stock-managers-who-played-defense-in-2019-are-left-scrambling-to-make-up-ground
https://www.latimes.com/business/story/2019-11-09/stock-managers-who-played-defense-in-2019-are-left-scrambling-to-make-up-ground	https://www.latimes.com/business/story/2019-11-08/gap-ceo-was-done-in-by-fashion-missteps-and-fading-brands

Virus

https://www.latimes.com/espanol/internacional/articulo/2019-11-09/monos-se-volvieron-inmunes-tras-inocularles-virus-del-ebola-con-mutacion	https://www.latimes.com/terms-of-service
https://www.latimes.com/science/sciencenow/la-sci-science-of-zika-five-ways-20160223-htmlstory.html	https://www.latimes.com/espanol/
https://www.latimes.com/espanol/internacional/articulo/2019-11-09/monos-se-volvieron-inmunes-tras-inocularles-virus-del-ebola-con-mutacion	https://www.latimes.com/science

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Overlap Graph:

