

CSCI 572 HOMEWORK 4: INDEXING THE WEB USING SOLR

Name: Khanh Duy Le

USC ID: 7249243900

Website Indexed: Washington Post

Step 1 : Solr Installation

- I downloaded solr and for the website as suggested in the guidelines.
- I started solr using **./bin/solr start**
- I then created a core using **bin/solr create -c myexample**
- Solr was seen on the web browser at port 8983 – **localhost:8983/solr/#**

Step 2: Indexing the Web-Page

- I downloaded the data from the Google Drive for Washingtonpost
- Bin/post -c myexample -filetypes html /home/khanh/shared/hw4/WP/WP - did the indexing.

The screenshot shows the Solr admin interface for the 'myexample' core. The left sidebar lists various management options like Dashboard, Logging, Core Admin, Java Properties, and Thread Dump. The main content area has three tabs: Statistics, Instance, and Replication (Master). The Statistics tab displays metrics such as Last Modified (7 days ago), Num Docs (10910), Max Doc (10910), Heap Memory (-1), Usage, Deleted Docs (0), Version (492), Segment Count (18), Optimized (✓), and Current (✓). The Instance tab shows CWD, Instance, Data, Index, and Impl details. The Replication (Master) tab shows a table with columns Version, Gen, and Size, listing 'Master (Searching)' and 'Master (Replicable)' entries. The bottom navigation bar includes links to Documentation, Issue Tracker, IRC Channel, Community forum, and Solr Query Syntax.

Step 3 : PageRank Algorithm:

- I downloaded Jsoup from the Web and wrote a Java file ExtractLinksListWP.java to find the WPEdgeList for the websites.

The following is a WPEdgeList snippet :

```

 6
 7 import java.io.*;
 
 @ Javadoc Declaration Console 
<terminated> ExtractLinksListWP [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_101.jdk/Contents/Home/bin/java (Nov 20, 2017, 10:41:22 PM)
8aca9fe321578484299911ff070e779d5520dcbbc1fe29e032860a798a41a3.html e96d500340ccb0f50072b536bea213dca8cfcac340382cb84d928afdb37770dc.html
d1843477ed0c54d0f54bcfa0dde166721e47e296124020302f0f29e0480a8a.html 014abbfd34c6e51530cc900f9956cb545a123533b425c09057ce08c056db56.html
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d130c904a0ef5ac6b7f23719e6aaee39eb9f2da31ebfa5d4757511861b.html 9c7a0d83143540a24f4e5995f3d971ee036621c460bd4c1d7fd9c4caeaffd776.html
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ad7e094a2eecd7a18eb6c4682a6682146fcfd64f72dc897d828e189e4f.html e18148e6b674662304607d4dc0306567d595cb563c9f8a.html
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7f34f275236118f45539fe0497575416f938c1e4fc6b1e67f95d76ca776a4ce.html e311c39e97a93063d40948955c04b2337aad9e3a315792cb1b8d223f3eb79a.html

```

```

<terminated> ExtractLinksListWP [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_101.jdk/Contents/Home/bin/java (Nov 20, 2017, 10:41:22 PM)
cdf34b1670ec97d0542862eaa0365a81f338f0cd8586f833b46d82f0e462415f5.html 0649f08a04953caa34530f821a06139ef0e7584de936957e148c0a3fe1cc.html
119daec7569e7142188fc0499bc4f066804836e69f2e4c22449f48ff25.html 67b7ce41e6295d056d457cfa74c072d406b2e9592d6b3d64ba47d4594600e1.html
6d41fad0724865b675c9825e1886782b460d34adebf3a4c8052740cc1858a6eb.html 06b0f8c8a3510ab275b3c5ce6673789560c462f102637cb4b91fdca8950f65a.html
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c9bfcdf757a32a2998e000c7e981c5e14cde869a1d068844291cbc3cd7.html fe3e0ff12be329f07c031623659887691eeb0c70c134ace6c605b6068b.html 7d04f9733b6b7e96fccc11f62c45289bc168a552ecea2e7361f619fb53467.html
38245d6424cd7577619e873906210481f40bbad4b1451825c23682d447e63f.html 9701b2e602c08e19c068ff70677279cd4bf8d08591ee788d5db89d9533169d66e.html
b39382364fd2fb52f73b119751176b199b6fc9245851b31efc14f25cf44af2b5.html f7242d55ed1b2cb369e85d20e849f7c8c8d42a826ab9494617b818a0402683c4.html

```

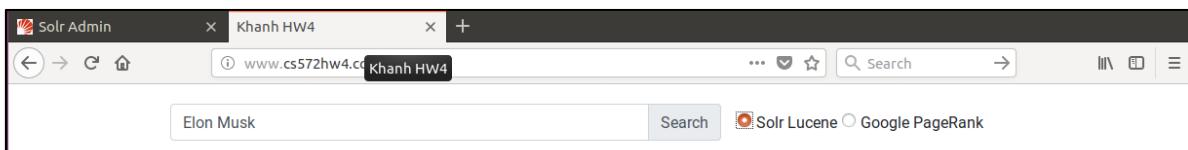
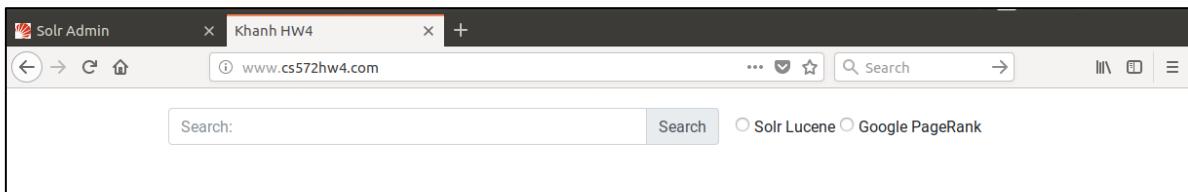
- The I used Networkx to read the graph and output a pagerank file name external_pageRankFile.txt as given in the folder.

- PageRank Factors : alpha=0.85, personalization=None, max_iter=30, tol=1e-06, nstart=None, weight='weight',dangling=None
- Then I copied the file into the data folder of my core.

The Following Snippet Shows a working model of my code :

1. Steps in Query

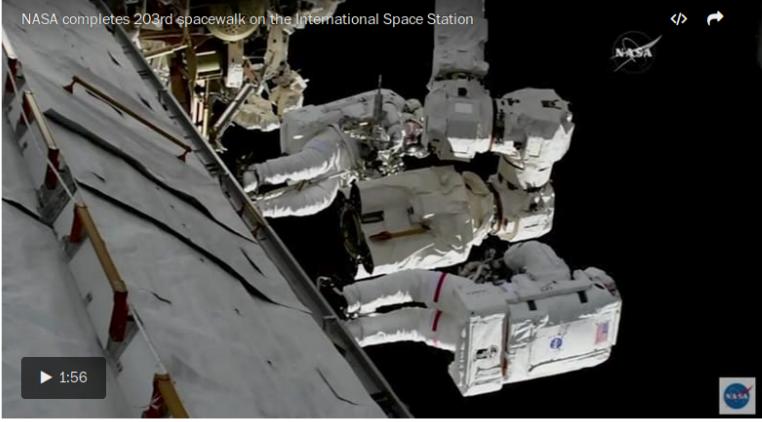
index.php gives the GUI on the localhost for querying solr. After querying, we can select the algorithm to be executed – Lucene or PageRank. The results are then displayed on the same page. These results are clickable links that can be routed to the destination link. The following snippets shows the process of Querying solr.



title	NASA completes 203rd spacewalk on the International Space Station - The Washington Post
og_url	http://www.washingtonpost.com/video/business/technology/nasa-completes-203rd-spacewalk-on-the-international-space-station/2017/10/05/4cf1b276-a9ec-11e7-9a98-07140d2eed02_video.html
description	NASA streamed the mission on October 5. Astronauts Randy Bresnik and Mark Vande Hei were the astronauts that walked on the surface.
id	/home/khanh/shared/hw4/WP/WP/08abc2fc5c12e78fe34b80571e688e8ca5bc3beadae712828c675d3e99f54cf.html
title	Why Elon Musk envisions new solar power in Puerto Rico - The Washington Post
og_url	https://www.washingtonpost.com/news/the-switch/wp/2017/10/06/why-musk-is-pitching-solar-panels-to-puerto-rico-even-as-residents-struggle-to-get-clean-water/
description	The entrepreneur says now is the time to put Puerto Rico on a long-term path to energy success.
id	/home/khanh/shared/hw4/WP/WP/0994aa057ba5048b555d3f6555ee2a9473d82d0e177091d23585add13762db15.html
title	Why Musk is pitching solar panels to Puerto Rico even as residents struggle to get clean water
og_url	NA
description	NA
id	/home/khanh/shared/hw4/WP/WP/f87218d14059f1ee15f893eb14d4f49c95665f15b0cf5a5cee9ec50c36a8d64d.html
title	Christian Davenport - The Washington Post
og_url	http://www.washingtonpost.com/people/christian-davenport
description	Christian Davenport covers the defense and space industries for The Post's Financial desk. He joined The Post in 2000 and has served as an editor on the Metro desk and as a reporter covering military affairs. He is the author of "As You Were: To War and Back with the Black Hawk Battalion of the Virginia National Guard."
id	/home/khanh/shared/hw4/WP/WP/661a12cc9df7f72be8e45a312b5474d533e2d166670b5f247bf457b16434af.html
title	Inside Trump's climate decision: After fiery debate, he 'stayed where he's always been' - The Washington Post
og_url	https://www.washingtonpost.com/politics/inside-trumps-climate-decision-after-fiery-debate-he-stayed-where-hes-always-been/2017/06/01/e4acb27e-46db-11e7-bcde-624ad94170ab_story.html
description	Warring factions inside and outside the White House didn't change Trump's mind on Paris.
id	/home/khanh/shared/hw4/WP/WP/a10c10951d777c2585d56decad61b711cd1a2ade1a334a33d11f709dbef08284.html

Solr Admin Khanh HW4 NASA completes 203rd spacewalk on the International Space Station

The Washington Post (WP Co... (US) https://www.washingtonpost.com/



NASA completes 203rd spacewalk on the International Space Station
Now watching
October 5, 2017



NASA launches powerful weather satellite
2 days ago

NASA completes 203rd spacewalk on the

Solr Admin Khanh HW4 www.cs572hw4.com/?q=Star+Wars+&algorithm=pageRank

Star Wars Search Solr Lucene Google PageRank

Results 1 - 10 of 1985:

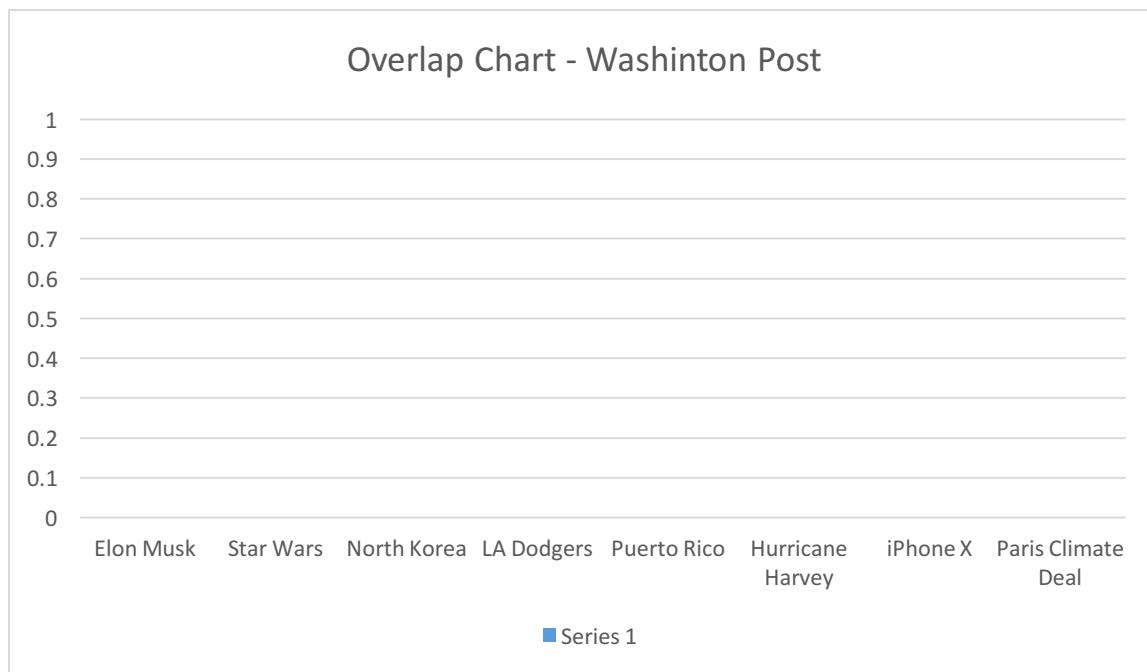
title	The Movie That Ate Cleveland Park - The Washington Post
og_url	https://www.washingtonpost.com/archive/lifestyle/1977/06/23/the-movie-that-ate-cleveland-park/494f67a6-40b5-45b4-968c-807a5bf61c57/
description	NA
id	/home/khanh/shared/hw4/WP/WP/8bc75c2fd768b5f209b240a5342671c28bc46ee53375329842a8e7956eaf9598.html
title	NFL Week 5: VP Mike Pence walks out on Colts; Odell Beckham Jr. fractures ankle; Aaron Rodgers leads comeback win - The Washington Post
og_url	https://www.washingtonpost.com/news/sports/wp/2017/10/08/nfl-week-5-the-focus-turns-from-protest-to-football-key-games-injuries-fantasy-news/
description	The protests may continue, but they're being overtaken by the games and Trump's lack of tweets.
id	/home/khanh/shared/hw4/WP/WP/1f8e0926dd44015193d72f9a0be6415004393b1fad03aa6a28f3c5357947756.html
title	Trump picks retired Marine Gen. James Mattis for secretary of defense - The Washington Post
og_url	https://www.washingtonpost.com/world/national-security/trump-has-chosen-retired-marine-gen-james-mattis-for-secretary-of-defense/2016/12/01/6c6b3b74-aff9-11e6-be1c-8ec35b1ad25_story.html
description	The decision will require nearly unprecedented legislation from Congress because Mattis is recently retired.
id	/home/khanh/shared/hw4/WP/WP/6d8954e0bbe6c94503fb09fcfa443eb2bd3be8daf892687aea56635cae0e3ac54.html
title	Troubled. Quiet. Macho. Angry. The volatile life of the Orlando shooter. - The Washington Post
og_url	https://www.washingtonpost.com/national/troubled-quiet-macho-angry-the-volatile-life-of-omar-mateen/2016/06/17/15229250-34a6-11e6-8758-d58e76e11b12_story.html
description	A pattern is evident in Omar Mateen's past — one of inner conflict and outbursts of rage.
id	/home/khanh/shared/hw4/WP/WP/ffe2367ec0591cb30107dbefdd5f63ab5a819babd1bf48b1d313864125604.html
title	Book review: 'The Surrendered' by Chang-rae Lee
og_url	http://www.washingtonpost.com/wp-dyn/content/article/2010/03/08/AR2010030803182.html
description	Chang-rae Lee's latest novel, "The Surrendered," in the works for more than five years, veers into territory bleaker than his earlier books. Like Jayne Anne Phillips's recent "Lark and Termite," it is a story about the ruinous effects of the Korean War on not one but several characters.
id	/home/khanh/shared/hw4/WP/WP/3dc1d421ecc78b648b1dd50b6cef4e98390e20e46e9c8a4223742dfa8f3584e2.html
title	How Trump's 'rage tweets' are being mocked by cartoonists - The Washington Post

2. Why Some Pages Have Higher Page Rank Values

- PageRank computes weight for each page based on the number of links that points to the page. Hence, In the assignment we create a graph that decides the list of edges pointing the page.
- This graph is then used to find the importance of any given page in the web. Solr algorithm uses only the Boolean and vector model that just scans the TF-IDF value and outputs the results.
- However, PageRank determines the weight of the page and then outputs it in a required order. Thus, these results follow a particular ranking and are different.
- So, the main reason that PageRank has higher page rank value is the fact that it analyses the weight of page on the number of links that point it.

The Graph of Overlap:

Query	Overlap
Elon Musk	0
Star Wars	0
North Korea	0
LA Dodgers	0
Puerto Rico	0
Hurricane Harvey	0
iPhone X	0
Paris Climate Deal	0



The results of the 8 Queries:

1. Elon Musk – Lucene – Tech

Solr Admin Khanh HW4 +

Elon Musk Search Solr Lucene Google PageRank

Results 1 - 10 of 130:

title	NASA completes 203rd spacewalk on the International Space Station - The Washington Post
og_url	http://www.washingtonpost.com/video/business/technology/nasa-completes-203rd-spacewalk-on-the-international-space-station/2017/10/05/4cf1b276-a9ec-11e7-9a98-07140d2eed02_video.html
description	NASA streamed the mission on October 5. Astronauts Randy Bresnik and Mark Vande Hei were the astronauts that walked on the surface.
id	/home/khanh/shared/hw4/WP/WP/08abc2fd5c12e79f34b80571e688e8a5bcbecda712828c675d3e99f54cf.html
title	Why Elon Musk envisions new solar power in Puerto Rico - The Washington Post
og_url	https://www.washingtonpost.com/news/the-switch/wp/2017/10/06/why-musk-is-pitching-solar-panels-to-puerto-rico-even-as-residents-struggle-to-get-clean-water/
description	The entrepreneur says now is the time to put Puerto Rico on a long-term path to energy success.
id	/home/khanh/shared/hw4/WP/WP/0994aa057ba504b855d3f6555ee2a9473d82d0e177091d23585add13762db15.html
title	Why Musk is pitching solar panels to Puerto Rico even as residents struggle to get clean water
og_url	NA
description	NA
id	/home/khanh/shared/hw4/WP/WP/f87218d14059f1ee15f893eb14d4f49c95665f15b0cf5a5cee9ec50c36a8d64d.html
title	Christian Davenport - The Washington Post
og_url	http://www.washingtonpost.com/people/christian-davenport
description	Christian Davenport covers the defense and space industries for The Post's Financial desk. He joined The Post in 2000 and has served as an editor on the Metro desk and as a reporter covering military affairs. He is the author of "As You Were: To War and Back with the Black Hawk Battalion of the Virginia National Guard."
id	/home/khanh/shared/hw4/WP/WP/661a12cc9dbf7f72be8eb45a312b5474d533e2d166670b5f247bf457b16434af.html
title	Inside Trump's climate decision: After fiery debate, he 'stayed where he's always been' - The Washington Post
og_url	https://www.washingtonpost.com/politics/inside-trumps-climate-decision-after-fiery-debate-he-stayed-where-hes-always-been/2017/06/01/e4acb27e-46db-11e7-bcde-624ad94170ab_story.html
description	Warring factions inside and outside the White House didn't change Trump's mind on Paris.
id	/home/khanh/shared/hw4/WP/WP/a10c10951d777c2585d56decad61b711cd1a2ade1a334a33d11f709dbef08284.html

2. Elon Musk – PageRank – Tech

Solr Admin Khanh HW4 +

Elon Musk Search Solr Lucene Google PageRank

Results 1 - 10 of 130:

title	A happy postmodernism at Marc Jacobs leads the way for spring 2018 - The Washington Post
og_url	https://www.washingtonpost.com/news/arts-and-entertainment/wp/2017/09/14/sparkles-big-shapes-bold-colors-silky-wraps-fashion-wants-you-to-find-your-joy-this-spring/
description	Highlights include Marc Jacobs's abstract florals and turbans from no particular place. It was otherworldly meets real world.
id	/home/khanh/shared/hw4/WP/WP/9eafbdb213940b8cf0c2690244533bd82fd835c61b9fd12cf885c7f7dc6912cd.html
title	Sen. Ben Sasse: 'Comey should testify before the Congress' - The Washington Post
og_url	http://www.washingtonpost.com/video/postlive/sen-ben-sasse-comey-should-testify-before-the-congress/2017/05/17/c1b158e8-3b54-11e7-a59b-26e0451a96fd_video.html
description	Sen. Ben Sasse (R-Neb.) calls for former FBI Director James Comey to testify in public in front of the Senate Judiciary Committee. He also says he would like Congress to have "any and all tapes" that may exist of Comey and President Trump at the White House.
id	/home/khanh/shared/hw4/WP/WP/0188b65dab6f927c0485ca34afa1d40b799eab0309ce1136ef341bacdb301254.html
title	Lin-Manuel Miranda and Renée Elise Goldsberry rap about Hillary Clinton - The Washington Post
og_url	http://www.washingtonpost.com/video/national/lin-manuel-miranda-and-renee-elise-goldsberry-rap-about-hillary-clinton/2016/10/18/45739b60-94e7-11e6-9cae-2a3574e296a6_video.html
description	"Hamilton" stars Lin-Manuel Miranda and Renée Elise Goldsberry rewrote one of the musical's hit songs for a Broadway-themed Hillary Clinton fundraiser on Oct. 17.
id	/home/khanh/shared/hw4/WP/WP/e36713318e8a526c1975327324fe881ecd3fdd3f847820056133b8e2484e6ba.html
title	Rep. Adam Schiff: 'Not acceptable' for top intel officials not to answer questions before Congress - The Washington Post
og_url	http://www.washingtonpost.com/video/postlive/schiff-not-acceptable-for-top-intel-officials-not-to-answer-questions-before-congress/2017/06/07/5ab78478-4bda-11e7-987c-42ab5745db2e_video.html
description	Rep. Adam Schiff says it was not acceptable for Director of National Intelligence Dan Coats and National Security Agency Director Mike Rogers to refuse to answer questions regarding their conversations with President Trump while testifying before the Senate Intelligence Committee.
id	/home/khanh/shared/hw4/WP/WP/536d0ea91328423126fa2a6211e5ab93917d494c2a4d727acdf663b88e20d358.html
title	John Podesta describes what it's like to be in the middle of an email hack - The Washington Post
og_url	http://www.washingtonpost.com/video/postlive/john-podesta-describes-what-it-s-like-to-be-in-the-middle-of-an-email-hack/2017/05/23/05c0c372-3fb9-11e7-b29f-f40ffced2ddb_video.html
description	Former Hillary Clinton Campaign Chairman John Podesta describes when he first learned his email account had been compromised. He says at the time there was "some suspicion"

3. Star Wars – Lucene – Tech

Solr Admin - Khanh HW4

www.cs572hw4.com/?q=Star+Wars+&algorithm=lucene

Search | Solr Lucene | Google PageRank

Star Wars

Results 1 - 10 of 1985:

title	og_url	description
'Star Wars: The Last Jedi' trailer beguilingly teases a young warrior's path forward - The Washington Post	https://www.washingtonpost.com/news/comic-riffs/wp/2017/10/09/star-wars-the-last-jedi-trailer-beguilingly-teases-a-young-warriors-road-ahead/	The "Star Wars: The Last Jedi" trailer lands, revealing the full meeting between Luke and Rey.
Star Wars at 40: Fans recall the magic of seeing the film during that first summer	/home/khanh/shared/hw4/WP/WP/2b30508fb852a587e96d899e6451d236293a3ff226da7f05c1f2128c7e81614.html	
'Star Wars: The Last Jedi' trailer beguilingly teases a young warrior's path forward	NA	
This 1977 review of the original 'Star Wars' predicted the future - The Washington Post	NA	
From his early first viewing, Washington Post critic Gary Arnold gauged its impact immediately.	https://www.washingtonpost.com/news/arts-and-entertainment/wp/2015/12/20/how-does-the-original-1977-star-wars-review-from-the-washington-post-hold-up/	
How Google's St. Patrick's Day Doodle is built on a Star Wars Easter egg	NA	
'Star Wars: The Force Awakens' fulfills destiny as biggest box-office opener ever with \$248 million - The Washington Post	NA	
https://www.washingtonpost.com/news/comic-riffs/wp/2015/12/20/star-wars-the-force-awakens-fulfills-destiny-as-biggest-box-office-opener-ever-with-238-million/		

4. Star Wars – PageRank – Tech

Solr Admin - Khanh HW4

www.cs572hw4.com/?q=Star+Wars+&algorithm=pageRank

Search | Solr Lucene | Google PageRank

Star Wars

Results 1 - 10 of 1985:

title	og_url	description
The Movie That Ate Cleveland Park - The Washington Post	https://www.washingtonpost.com/archive/lifestyle/1977/06/23/the-movie-that-ate-cleveland-park/494f67a6-40b5-45b4-968c-807a5bf61c57/	
NFL Week 5: VP Mike Pence walks out on Colts; Odell Beckham Jr. fractures ankle; Aaron Rodgers leads comeback win - The Washington Post	NA	
NFL Week 5: VP Mike Pence walks out on Colts; Odell Beckham Jr. fractures ankle; Aaron Rodgers leads comeback win - The Washington Post	https://www.washingtonpost.com/news/sports/wp/2017/10/08/nfl-week-5-the-focus-turns-from-protest-to-football-key-games-injuries-fantasy-news/	The protests may continue, but they're being overtaken by the games and Trump's lack of tweets.
Trump picks retired Marine Gen. James Mattis for secretary of defense - The Washington Post	/home/khanh/shared/hw4/WP/WP/8bc75c2fd768b5f209b240a5342671c28bc46ee53375329842a8e7956eaef9598.html	
Trump picks retired Marine Gen. James Mattis for secretary of defense - The Washington Post	https://www.washingtonpost.com/world/national-security/trump-has-chosen-retired-marine-gen-james-mattis-for-secretary-of-defense/2016/12/01/6c6b3b74-aff9-11e6-be1c-8cec35b1ad25_story.html	
Troubled. Quiet. Macho. Angry. The volatile life of the Orlando shooter. - The Washington Post	description	The decision will require nearly unprecedented legislation from Congress because Mattis is recently retired.
Troubled. Quiet. Macho. Angry. The volatile life of the Orlando shooter. - The Washington Post	og_url	https://www.washingtonpost.com/national/troubled-quiet-macho-angry-the-volatile-life-of-omar-mateen/2016/06/17/15229250-34a6-11e6-8758-d58e76e11b12_story.html
Book review: 'The Surrendered' by Chang-rae Lee	description	A pattern is evident in Omar Mateen's past — one of inner conflict and outbursts of rage.
Book review: 'The Surrendered' by Chang-rae Lee	og_url	http://www.washingtonpost.com/wp-dyn/content/article/2010/03/08/AR2010030803182.html
How Trump's 'rage tweets' are being mocked by cartoonists - The Washington Post	description	Chang-rae Lee's latest novel, "The Surrendered," in the works for more than five years, veers into territory bleaker than his earlier books. Like Jayne Anne Phillips's recent "Lark and Termite," it is a story about the ruinous effects of the Korean War on not one but several characters.

5. North Korea – Lucene – Politics

Solr Admin Khanh HW4 +

www.cs572hw4.com/?q=North+Korea+&algorithm=lucene

North Korea Search Solr Lucene Google PageRank

Results 1 - 10 of 2241:

title	og_url	description
North Korean nuclear missile targets in the U.S.: Where might they strike? - Washington Post	https://www.washingtonpost.com/graphics/world/north-korea-targets/	A closer look at Pyongyang's propaganda provides clues to Kim Jong Un's nuclear strategy
How North Koreans are escaping the clutches of Kim Jong Un The Washington Post	http://www.washingtonpost.com/sf/world/2017/09/09/escaping-north-korea-we-had-already-decided-to-kill-ourselves-rather-than-be-sent-back/	How North Koreans are escaping the clutches of Kim Jong Un
Some creative ways to deal with North Korea	/home/khanh/shared/hw4/WP/WP/3fe585d8c7dd816197432fa16d70b288a01158228dd92ea9948731d9b4aecf1.html	NA
To deter North Korea, Japan and South Korea should go nuclear - The Washington Post	https://www.washingtonpost.com/news/the-worldpost/wp/2017/10/10/to-deter-north-korea-japan-and-south-korea-should-go-nuclear/	Once established, a six-way balance of mutually assured destruction — among the U.S., China, Russia, Japan, South Korea and North Korea — will be stabilizing.
North Korea now making missile-ready nuclear weapons, U.S. analysts say	/home/khanh/shared/hw4/WP/WP/a4c82d962c32de7c75ebf3bde304882752def9bcad542f43aaa5f3d5a105241e.html	NA
US Cuba relations: Donald Trump foreign policy	https://www.washingtonpost.com/graphics/2017/world/trump-shifting-alliances/	NA
The president promised to put "America first." Here is what his administration has done so far		

6. North Korea – PageRank – Politics

Solr Admin Khanh HW4 +

www.cs572hw4.com/?q=North+Korea+&algorithm=pageRank

North Korea Search Solr Lucene Google PageRank

Results 1 - 10 of 2241:

title	og_url	description
Maryland QB Max Bortenschlager is 'day-to-day,' hasn't been cleared for Northwestern game - The Washington Post	https://www.washingtonpost.com/news/terrapins-insider/wp/2017/10/10/maryland-qb-max-bortenschlager-is-day-to-day-hasnt-been-cleared-for-northwestern-game/	Maryland could be starting its fourth quarterback in six games if the injured sophomore isn't ready to go.
NFL Week 5: VP Mike Pence walks out on Colts; Odell Beckham Jr. fractures ankle; Aaron Rodgers leads comeback win - The Washington Post	https://www.washingtonpost.com/news/sports/wp/2017/10/08/nfl-week-5-the-focus-turns-from-protest-to-football-key-games-injuries-fantasy-news/	The protests may continue, but they're being overtaken by the games and Trump's lack of tweets.
Recently Sold Homes - Washington Post		NA
Search Recently Sold Homes in the DC metro area at WashingtonPost.com. Filter homes by location, buyer/seller, property details and the sale agent, and view results on a map.		/home/khanh/shared/hw4/WP/WP/a2cfafaa73919103ddfff51df3db3b2f45c9d1bbf108baadcb86195e.html
Trump picks retired Marine Gen. James Mattis for secretary of defense - The Washington Post	https://www.washingtonpost.com/world/national-security/trump-has-chosen-retired-marine-gen-james-mattis-for-secretary-of-defense/2016/12/01/6c6b3b74-aff9-11e6-be1c-8cec35b1ad25_story.html	The decision will require nearly unprecedented legislation from Congress because Mattis is recently retired.
We should be deeply worried about NAFTA - The Washington Post	https://www.washingtonpost.com/opinions/we-should-be-deeply-worried-about-nafta/2017/08/14/8947d76c-803b-11e7-b359-15a3617c767b_story.html	A botched negotiation would be a gift to China.
For some foreign diplomats, the Trump White House is a troubling enigma - The Washington Post	https://www.washingtonpost.com/world/national-security/for-some-foreign-diplomats-the-trump-white-house-is-a-troubling-enigma/2017/10/09/50323152-a534-11e7-	

7. LA Dodgers – Lucene – Sports

Solr Admin Khanh HW4 Khanh HW4 www.cs572hw4.com/?q=LA+Dodgers+&algorithm=pageRank Search Solr Lucene Google PageRank

Results 1 - 10 of 7062:

title	og_url	description
Virginia Republicans reject any and all suggestions to expand health coverage - The Washington Post		GOP lawmakers reject any and all suggestions to expand health coverage.
On whirlwind trip to Turkey, Tillerson tries to assuage a frustrated ally - The Washington Post		The NATO member is alarmed at U.S. support for Kurds battling the Islamic State in Syria.
Maryland QB Max Bortenschlager is 'day-to-day,' hasn't been cleared for Northwestern game - The Washington Post		Maryland could be starting its fourth quarterback in six games if the injured sophomore isn't ready to go.
When did Nationals GM Mike Rizzo become a Cubs fan? Back in the summer of '69. - The Washington Post		"This is the cathedral that I used to go to as a kid," Rizzo said on the eve of Monday's Game 3.
'It's a disgraceful job': Puerto Rican congressman slams Trump over hurricane response - The Washington Post		The congressman, who has been critical of the Trump administration, was nearly moved to tears during a television interview.
Kazuo Ishiguro wins Nobel Prize for literature - The Washington Post		

8. LA Dodgers – PageRank – Sports

Solr Admin Khanh HW4 Khanh HW4 www.cs572hw4.com/?q=LA+Dodgers+&algorithm=pageRank Search Solr Lucene Google PageRank

Results 1 - 10 of 7062:

title	og_url	description
Virginia Republicans reject any and all suggestions to expand health coverage - The Washington Post		GOP lawmakers reject any and all suggestions to expand health coverage.
On whirlwind trip to Turkey, Tillerson tries to assuage a frustrated ally - The Washington Post		The NATO member is alarmed at U.S. support for Kurds battling the Islamic State in Syria.
Maryland QB Max Bortenschlager is 'day-to-day,' hasn't been cleared for Northwestern game - The Washington Post		Maryland could be starting its fourth quarterback in six games if the injured sophomore isn't ready to go.
When did Nationals GM Mike Rizzo become a Cubs fan? Back in the summer of '69. - The Washington Post		"This is the cathedral that I used to go to as a kid," Rizzo said on the eve of Monday's Game 3.
'It's a disgraceful job': Puerto Rican congressman slams Trump over hurricane response - The Washington Post		The congressman, who has been critical of the Trump administration, was nearly moved to tears during a television interview.
Kazuo Ishiguro wins Nobel Prize for literature - The Washington Post		

9. Puerto Rico – Lucene – World

Puerto Rico

Search Solr Lucene Google PageRank

Results 1 - 10 of 928:

title	og_url	description
Hurricane Maria: Powerful storm knocks out power to all of Puerto Rico - The Washington Post	https://www.washingtonpost.com/news/post-nation/wp/2017/09/20/hurricane-maria-takes-aim-at-puerto-rico-with-force-not-seen-in-modern-history/	Maria is the strongest hurricane to hit Puerto Rico since 1932.
Trump hails 'incredible' response in 'lovely' trip to storm-torn Puerto Rico	/home/khanh/shared/hw4/WP/WP/a9fc8cb63dc655ec8d381be6fb8c45d9e72fed3295f5805f973ca69698e779fd.html	NA
Puerto Rico is being treated like a colony after Hurricane Maria	/home/khanh/shared/hw4/WP/WP/70da2ad801a05b36f40e9117fe77d937ea78482b4a9bbd21f60fdbd4017f590a9.html	NA
Hurricane Maria: 'Thousands of people could die. 70,000 in Puerto Rico urged to evacuate with dam in 'imminent' danger of failure - The Washington Post	https://www.washingtonpost.com/news/post-nation/wp/2017/09/22/at-least-6-dead-in-puerto-rico-due-to-hurricane-maria-officials-say/	Entire neighborhoods are blanketed in murky water, the waves in some cases reaching near the first-floor windows. Tops of buildings were sliced open, their top-floor rooms visible like dollhouses.
The sad suspicion about Trump's shameful treatment of Puerto Rico	/home/khanh/shared/hw4/WP/WP/a6bbc941cd929f2e7851da45d507822cf6288cf697ea46f74defe328d0c7ba.html	NA
Puerto Ricans are going to flee if President Trump doesn't fix hurricane relief	/home/khanh/shared/hw4/WP/WP/4c6344a2ddec070e976bd0805cc849e9bdae155e7b449843febcb68e65e656757.html	NA

10. Puerto Rico – PageRank – World

Khanh HW4

Search Solr Lucene Google PageRank

Results 1 - 10 of 928:

title	og_url	description
'It's a disgraceful job': Puerto Rican congressman slams Trump over hurricane response - The Washington Post	https://www.washingtonpost.com/news/powerpost/wp/2017/09/30/its-a-disgraceful-job-puerto-rican-congressman-slams-trump-over-hurricane-response/	The congressman, who has been critical of the Trump administration, was nearly moved to tears during a television interview.
A survivalist filled his massive basement with food – then decided Puerto Ricans needed it more - The Washington Post	https://www.washingtonpost.com/news/inspired-life/wp/2017/10/06/a-survivalist-filled-his-massive-basement-with-food-then-decided-puerto-ricans-needed-it-more/	New Jersey prep Joseph Badame stocked up 80 barrels of food. They're now being sent to Puerto Rico.
When all else fails for their children, desperate parents drive national push for medical marijuana - The Washington Post	https://www.washingtonpost.com/blogs/govbeat/wp/2015/08/18/when-all-else-fails-for-their-children-desperate-parents-drive-national-push-for-medical-marijuana/	Since 2014, 17 states have legalized the use of marijuana-derived cannabidiol (CBD) in children. But the process is neither uniform nor simple.
Along with Trump's rhetoric, the stakes for 2016 have risen dramatically - The Washington Post	https://www.washingtonpost.com/politics/along-with-trumps-rhetoric-the-stakes-for-2016-have-risen-dramatically/2015/12/08/43e64592-9dd8-11e5-a3c5-c772cc5a43c_story.html	Trump's call to ban Muslims from entering the U.S. raises the question of what kind of country Americans want.
Sen. Ben Sasse: 'Comey should testify before the Congress' - The Washington Post	http://www.washingtonpost.com/video/positive/sen-ben-sasse-comey-should-testify-before-the-congress/2017/05/17/c1b158e8-3b54-11e7-a59b-26e0451a96fd_video.html	Sen. Ben Sasse (R-Neb.) calls for former FBI Director James Comey to testify in public in front of the Senate Judiciary Committee. He also says he would like Congress to have "any and all tapes" that may exist of Comey and President Trump at the White House.
As Puerto Rican superhero makes debut, her writer brings 'the power of our people' to comics	/home/khanh/shared/hw4/WP/WP/0188b65dab6f927c0485ca34afa1d40b799eab0309ce1136ef341bacdb301254.html	NA

11. Hurricane Harvey – Lucene – Nation

Solr Admin - Khanh HW4

Search: Hurricane Harvey

Results 1 - 10 of 1482:

title	og_url	description
Trump says 'we've had bigger storms' when asked about Harvey, Irma and climate change - The Washington Post	https://www.washingtonpost.com/news/energy-environment/wp/2017/09/14/trump-says-weve-had-bigger-storms-when-asked-about-harvey-irma-and-climate-change/	The president talked about bigger storms that he said occurred in the 1930s and 1940s.
When a red state gets the blues	/home/khanh/shared/hw4/WP/WP/c2fa5b709f6a74336a2e5a5acd8e12693817e8adc4bb75d449fc1c5d9d9b47b9.html	NA
Energy and Environment - The Washington Post	https://www.washingtonpost.com/news/energy-environment/wp/category/hurricanes/	NA
As Hurricane Harvey slams Texas, a look at the most devastating and deadly hurricanes in U.S. history - The Washington Post	/home/khanh/shared/hw4/WP/WP/3473d81d030cefec9690715a09a555e70a5f16c0afc106f5b2147ab28963ccab.html	From Galveston in 1900 to Katrina in 2005, people who ignored warnings to evacuate paid dearly for it. Will those in the path of Hurricane Harvey make the same mistake?
Trump returns to flood-ravaged Texas, this time to try out role of 'consoler-in-chief' - The Washington Post	https://www.washingtonpost.com/politics/trump-arrives-in-houston-to-meet-with-hurricane-harvey-survivors/2017/09/02/4194da68-8ff0-11e7-91d5-ab4e4bb76a3a_story.html	If the president's visit last week was about projecting competence, then his Saturday return was about conveying empathy.
Wizards' Kelly Oubre, uprooted by Hurricane Katrina, remembers his New Orleans The Washington Post	http://www.washingtonpost.com/sf/sports/wp/2017/08/31/wizards-kelly-oubre-displaced-by-hurricane-katrina-at-age-9-revisits-new-orleans/	Wizards' Kelly Oubre, uprooted by Hurricane Katrina, remembers his New Orleans

12. Hurricane Harvey – PageRank – Nation

Solr Admin - Khanh HW4

Search: Hurricane Harvey

Results 1 - 10 of 1482:

title	og_url	description
'It's a disgraceful job': Puerto Rican congressman slams Trump over hurricane response - The Washington Post	https://www.washingtonpost.com/news/powerpost/wp/2017/09/30/its-a-disgraceful-job-puerto-rican-congressman-slams-trump-over-hurricane-response/	The congressman, who has been critical of the Trump administration, was nearly moved to tears during a television interview.
NFL Week 5: VP Mike Pence walks out on Colts; Odell Beckham Jr. fractures ankle; Aaron Rodgers leads comeback win - The Washington Post	https://www.washingtonpost.com/news/sports/wp/2017/10/08/nfl-week-5-the-focus-turns-from-protest-to-football-key-games-injuries-fantasy-news/	/home/khanh/shared/hw4/WP/WP/104597ea542ce15d49945f93889a0bc6a341f63c88a4fd9de7f814bbc03206fb.html
A survivalist filled his massive basement with food – then decided Puerto Ricans needed it more - The Washington Post	https://www.washingtonpost.com/news/inspired-life/wp/2017/10/06/a-survivalist-filled-his-massive-basement-with-food-then-decided-puerto-ricans-needed-it-more/	New Jersey prepper Joseph Badame stocked up 80 barrels of food. They're now being sent to Puerto Rico.
The shadow of an assassinated American Nazi commander hangs over Charlottesville - The Washington Post	https://www.washingtonpost.com/news/retropolis/wp/2017/08/21/the-shadow-of-an-assassinated-american-nazi-commander-hangs-over-charlottesville/	/home/khanh/shared/hw4/WP/WP/1f8e0926dd44015193d7219a0be6415004393bfad03aa6a28f3c5357947756.html
Trump meets with Kissinger - The Washington Post	http://www.washingtonpost.com/video/politics/trump-meets-with-kissinger/2017/10/10/5ecc6bfa-add7-11e7-9b93-b97043e57a22_video.html	President Trump welcomed Dr. Henry Kissinger to the Oval Office on Oct. 10.
Trump agrees to \$25 million settlement in Trump University fraud cases - The Washington Post	https://www.washingtonpost.com/politics/source-trump-nearing-settlement-in-trump-university-fraud-cases/	/home/khanh/shared/hw4/WP/WP/4bc47e40ba65dec2222a9a48e76d026f57effae452e268aa9adc73cc76ae9f3b.html

13. iPhone X – Lucene – Tech

Solr Admin Khanh HW4 Open a new tab (Ctrl+T) Search Solr Lucene Google PageRank

iPhone X Results 1 - 10 of 10910:

title	og_url	description	id
iPhone 8 and iPhone 8 Plus Review - The Washington Post	https://www.washingtonpost.com/news/the-switch/wp/2017/09/19/apples-iphone-8-and-iphone-8-plus-wont-blow-you-away-but-theyre-still-solid-phones/	The iPhone 8 and iPhone 8 Plus are, this year, the phones for people who prize function over fancy features.	/home/khanh/shared/hw4/WP/WP/226434f231bb190bb2d2e8b863e3e913582aca51c3634bd08bb90996837bce2a.html
iPhone 8 and iPhone 8 Plus Review - The Washington Post	https://www.washingtonpost.com/news/the-switch/wp/2017/09/19/apples-iphone-8-and-iphone-8-plus-wont-blow-you-away-but-theyre-still-solid-phones/	The iPhone 8 and iPhone 8 Plus are, this year, the phones for people who prize function over fancy features.	/home/khanh/shared/hw4/WP/WP/8f344e6fdd0da225178d49ef15a96e4be31230cbc3d7de239a5d800d99bd1e.html
iPhone 8 and iPhone 8 Plus Review - The Washington Post	https://www.washingtonpost.com/news/the-switch/wp/2017/09/19/apples-iphone-8-and-iphone-8-plus-wont-blow-you-away-but-theyre-still-solid-phones/	The iPhone 8 and iPhone 8 Plus are, this year, the phones for people who prize function over fancy features.	/home/khanh/shared/hw4/WP/WP/d367ea4799f887725f735fcdbadb8f3a9cabef02e38f0df0491f57bbafab877a.html
FBI paid professional hackers one-time fee to crack San Bernardino iPhone - The Washington Post	https://www.washingtonpost.com/world/national-security/fbi-paid-professional-hackers-one-time-fee-to-crack-sanbernardino-iphone/2016/04/12/5397814a-00de-11e6-9d36-33d198ea26c5_story.html	The researchers came from an ethically murky corner of the hacking world.	/home/khanh/shared/hw4/WP/WP/76dabee1d2ade5f5ddfc8f0f58dc9fb7670b029e5eba4d7d97fd3bcfab4e021b.html
FBI paid professional hackers one-time fee to crack San Bernardino iPhone - The Washington Post	https://www.washingtonpost.com/world/national-security/fbi-paid-professional-hackers-one-time-fee-to-crack-sanbernardino-iphone/2016/04/12/5397814a-00de-11e6-9d36-33d198ea26c5_story.html	The researchers came from an ethically murky corner of the hacking world.	/home/khanh/shared/hw4/WP/WP/419d5da452ffed851d1d7565bcaa146dd21792685f0a5089544ae42affadd.html
FBI paid professional hackers one-time fee to crack San Bernardino iPhone - The Washington Post	https://www.washingtonpost.com/world/national-security/fbi-paid-professional-hackers-one-time-fee-to-crack-sanbernardino-iphone/2016/04/12/5397814a-00de-11e6-9d36-33d198ea26c5_story.html	The researchers came from an ethically murky corner of the hacking world.	/home/khanh/shared/hw4/WP/WP/419d5da452ffed851d1d7565bcaa146dd21792685f0a5089544ae42affadd.html

14. iPhone X – PageRank – Tech

Solr Admin Khanh HW4 Open a new tab (Ctrl+T) Search Solr Lucene Google PageRank

iPhone X Results 1 - 10 of 10910:

title	og_url	description	id
Virginia Republicans reject any and all suggestions to expand health coverage - The Washington Post	https://www.washingtonpost.com/opinions/virginia-republicans-reject-any-and-all-suggestions-to-expand-health-coverage/2014/09/19/ef94d21e-3f74-11e4-9587-5dad96295f0_story.html	GOP lawmakers reject any and all suggestions to expand health coverage.	/home/khanh/shared/hw4/WP/WP/2677b067b51530457a7cf3582a2953ed722cb896e08e67df16564c321ffce138.html
The Movie That Ate Cleveland Park - The Washington Post	https://www.washingtonpost.com/archive/lifestyle/1977/06/23/the-movie-that-ate-cleveland-park/494f67a6-40b5-45b4-968c-807a5bf61c57/	NA	/home/khanh/shared/hw4/WP/WP/8bc75c2fd768b5f209b240a5342671c28bc46ee53375329842a8e7956eaf9598.html
How a technology partnership enhances lives around the world	http://www.washingtonpost.com/sf/brand-connect/dell/how-a-technology-partnership-enhances-lives-around-the-world/	NA	/home/khanh/shared/hw4/WP/WP/41f73ca8df8dc7db71816e67d2b837589302c627982b965631cccc14884e6db.html
On whirlwind trip to Turkey, Tillerson tries to assuage a frustrated ally - The Washington Post	https://www.washingtonpost.com/world/on-whirlwind-trip-to-turkey-tillerson-tries-to-assuage-a-frustrated-ally/2017/03/30/4264f538-13fc-11e7-bb16-269934184168_story.html	The NATO member is alarmed at U.S. support for Kurds battling the Islamic State in Syria.	/home/khanh/shared/hw4/WP/WP/f7789620799867247e5234c4d78340175e8bd1c15c0eb1ce3b4df1bb4ef49bbc.html
Maryland QB Max Bortenschlager is 'day-to-day,' hasn't been cleared for Northwestern game - The Washington Post	https://www.washingtonpost.com/news/terrapins-insider/wp/2017/10/10/maryland-qb-max-bortenschlager-is-day-to-day-hasnt-been-cleared-for-northwestern-game/	Maryland could be starting its fourth quarterback in six games if the injured sophomore isn't ready to go.	/home/khanh/shared/hw4/WP/WP/420e1a4dee2bac05c6905e6d4bee2d58d90d86d3dec7af1d14e9fdcc51fbc30.html
When did Nationals GM Mike Rizzo become a Cubs fan? Back in the summer of '69. - The Washington Post	https://www.washingtonpost.com/news/nationals-journal/wp/2017/10/09/when-was-nationals-gm-mike-rizzo-a-chicago-cubs-fan-back-in-the-summer-of-69/		

15. Paris Climate Deal – Lucene – World

Solr Admin Khanh HW4 + www.cs572hw4.com/?q=Paris+Climate+Deal Open a new tab (Ctrl+T) Solr Lucene Google PageRank

Paris Climate Deal Search Solr Lucene Google PageRank

Results 1 - 10 of 2850:

	title	og_url	description
1	Trump announces U.S. will exit Paris climate deal, sparking criticism at home and abroad - The Washington Post	https://www.washingtonpost.com/politics/trump-to-announce-us-will-exit-paris-climate-deal/2017/06/01/fbcb0196-46da-11e7-bcde-624ad94170ab_story.html	The decision to withdraw from the deal could have severe ramifications internationally.
2	Trump announces U.S. will exit Paris climate deal, sparking criticism at home and abroad	/home/khanh/shared/hw4/WP/WP/2b056776d49900999f7695fb8c3d2b6dc0dd51fd8216d27550aa62a65f9456b8.html	NA
3	Inside Trump's climate decision: After fiery debate, he 'stayed where he's always been' - The Washington Post	https://www.washingtonpost.com/politics/inside-trumps-climate-decision-after-fiery-debate-he-stayed-where-hes-always-been/2017/06/01/e4acb27e-46db-11e7-bcde-624ad94170ab_story.html	Warring factions inside and outside the White House didn't change Trump's mind on Paris.
4	Inside Trump's climate decision: After fiery debate, he 'stayed where he's always been'	/home/khanh/shared/hw4/WP/WP/a10c10951d77c2585d56decad61b711cd1a2ade1a334a33d11f709dbf08284.html	NA
5	Trump announces U.S. will exit Paris climate deal, sparking criticism at home and abroad - The Washington Post	https://www.washingtonpost.com/politics/trump-announces-u-s-will-exit-paris-climate-deal/2017/06/01/fbcb0196-46da-11e7-bcde-624ad94170ab_story.html	The decision to withdraw from the deal could have severe ramifications internationally.
6	Trump announces U.S. will exit Paris climate deal, sparking criticism at home and abroad - The Washington Post	https://www.washingtonpost.com/politics/trump-announces-u-s-will-exit-paris-climate-deal/2017/06/01/fbcb0196-46da-11e7-bcde-624ad94170ab_story.html	NA

16. Paris Climate Deal – PageRank – World

Solr Admin Khanh HW4 + www.cs572hw4.com/?q=Paris+Climate+Deal+&algorithm=pageRank Open a new tab (Ctrl+T) Solr Lucene Google PageRank

Paris Climate Deal Search Solr Lucene Google PageRank

Results 1 - 10 of 2850:

	title	og_url	description
1	Virginia Republicans reject any and all suggestions to expand health coverage - The Washington Post	https://www.washingtonpost.com/opinions/virginia-republicans-reject-any-and-all-suggestions-to-expand-health-coverage/2014/09/19/ef94d21e-3f74-11e4-9587-5dad96295f0_story.html	GOP lawmakers reject any and all suggestions to expand health coverage.
2	Trump picks retired Marine Gen. James Mattis for secretary of defense - The Washington Post	/home/khanh/shared/hw4/WP/WP/2677b067b51530457a7cf3582a2953ed722cb896e08e67df16564c321ffce138.html	The decision will require nearly unprecedented legislation from Congress because Mattis is recently retired.
3	Trump picks retired Marine Gen. James Mattis for secretary of defense - The Washington Post	https://www.washingtonpost.com/world/national-security/trump-has-chosen-retired-marine-gen-james-mattis-for-secretary-of-defense/2016/12/01/6c6b3b74-aff9-11e6-be1c-8cec35b1ad25_story.html	A botched negotiation would be a gift to China.
4	We should be deeply worried about NAFTA - The Washington Post	https://www.washingtonpost.com/opinions/we-should-be-deeply-worried-about-nafta/2017/08/14/8947d76c-803b-11e7-b359-15a3617c767b_story.html	The decision will require nearly unprecedented legislation from Congress because Mattis is recently retired.
5	For some foreign diplomats, the Trump White House is a troubling enigma - The Washington Post	/home/khanh/shared/hw4/WP/WP/e40e221057c4a677c1a8c50fabcf4f30e3af15d3d5f7fcda9655e494c1fd2868.html	Policy, and who makes it, remains a riddle, and there is growing acceptance the administration's unpredictability is a permanent condition.
6	The fake news that haunted George Washington - The Washington Post	https://www.washingtonpost.com/news/retropolis/wp/2017/04/10/the-fake-news-that-haunted-george-washington/	Forged letters attributed to Washington during the Revolutionary War dogged him for the rest of his life.

Conclusion: I implemented Solr with Lucene and PageRank and compared the results.