

Part 1: Steps followed to complete this assignment

Step 0: Preparation

Step 0.1: Install VirtualBox and Ubuntu 16.04.2 LTS

Step 0.2: Install Apache Solr 6.5.0

Step 0.3: Download assigned HTML files (NYTimesData) and Index HTML files in Solr

Step 1: Build a client application for Solr

Step 1.1: Create a webpage using PHP with solr-php-client library and Apache web server

Step 2: Compute PageRank scores and add scores into Solr

Step 2.1: Create edgelist.txt using Java and JSoup library

Step 2.2: Create external_pageRankFile.txt using python and NetworkX library

(pagerank algorithm initial parameters: alpha=0.85, personalization=None, max_iter=30, tol=1e-06, nstart=None, weight='weight',dangling=None)

Step 2.3: Place external_pageRankFile.txt into Solr data folder and setup managed-schema.xml and solrconfig.xml

Step 3: Compare the two ranking algorithms

Step 3.1: Compare the results of the two ranking algorithms with the following eight queries (Brexit, NASDAQ, NBA, Snapchat, Illegal Immigration, Donald Trump, Russia, NASA)

Part 2: Query results of the two ranking algorithms

Query 1: Brexit

Solr Default

The screenshot shows a web browser window with the URL `localhost/mySolr/?q=Brexit&sort=score+desc`. The search results are displayed in a list format, showing the top 10 results. The results are sorted by relevance (score) in descending order.

Search: Submit Query

Ranking: ☒ Solr Default ☐ PageRank

Results 1 - 10 of 552:

- Cyclists Block Boris Johnson's Car - Video - NYTimes.com**
<https://www.nytimes.com/video/world/europe/100000004491992/cyclists-block-boris-johnsons-car.html>
a0393c59-dc60-429c-b5df-18ea8d54d7c6.html
Boris Johnson, the former London mayor who helped lead the Leave campaign, was booed and confronted by cyclists who blocked his car on Friday.
- 'Brexit' Will Strengthen Britain, Trump Says - Video - NYTimes.com**
<https://www.nytimes.com/video/world/europe/100000004491865/trump-applauds-brexite.html>
09456f25-cb11-4a78-9b9e-97e3f7fadfee.html
Speaking in Scotland on Friday, Donald J. Trump, the presumptive Republican presidential nominee, welcomed Britain's vote to leave the European Union.
- Bending Elbows After 'Brexit' - Video - NYTimes.com**
<https://www.nytimes.com/video/business/international/100000004494091/bending-elbows-after-brexite.html>
6954b51e-ad0a-43d6-9aee-229cdf8e2e1a.html
Feelings of shock and anxiety were prevalent during happy hour on Wall Street.
- La incertidumbre por el 'brexit' contagia a los mercados financieros - Español**
<https://www.nytimes.com/es/2016/06/16/la-incertidumbre-por-el-brexite-contagia-a-los-mercados-financieros/>
e7717561-45ce-458d-95de-fe521ec6caf8.html
- Desempolvemos la ruta hacia el 'brexit' - Español**
<https://www.nytimes.com/es/2016/11/11/desempolvemos-la-ruta-hacia-el-brexite/>
83aa520b-a88e-464a-af1d-bf949aafec83.html
- British Youth React to 'Brexit' - Video - NYTimes.com**
<https://www.nytimes.com/video/world/europe/100000004493085/british-youth-react-to-brexite.html>
4dd5d75a-d1e5-4f0b-a84e-d8cf6cc93d9.html
A day after the United Kingdom voted to leave the European Union, despite young people solidly voting to remain, British youth aired their grievances.

The screenshot also shows a second browser window with the same URL, displaying the same results but with a different set of results visible, indicating a different ranking algorithm or a different set of results.

- Desempolvemos la ruta hacia el 'brexit' - Español**
<https://www.nytimes.com/es/2016/11/11/desempolvemos-la-ruta-hacia-el-brexite/>
83aa520b-a88e-464a-af1d-bf949aafec83.html
- British Youth React to 'Brexit' - Video - NYTimes.com**
<https://www.nytimes.com/video/world/europe/100000004493085/british-youth-react-to-brexite.html>
4dd5d75a-d1e5-4f0b-a84e-d8cf6cc93d9.html
A day after the United Kingdom voted to leave the European Union, despite young people solidly voting to remain, British youth aired their grievances.
- Brexit - Español**
<https://www.nytimes.com/es/tag/brexit/>
49dd0dd6-9125-4950-9942-6a13e205248c.html
- Australia Premier Concerned About Brexit - Video - NYTimes.com**
<https://www.nytimes.com/video/world/europe/100000004493001/australia-premier-concerned-about-brexite.html>
c30060d1-a569-4d7d-8aec-d1188073b044.html
Prime Minister Malcolm Turnbull of Australia said on Friday he expects a period of uncertainty and some instability in global markets following Britain's 'Brexit' vote.
- 'Brexit' Hits British Financial Sector - Video - NYTimes.com**
<https://www.nytimes.com/video/world/europe/100000004493002/brexit-hits-british-financial-sector.html>
7f84fbc-520b-48f4-81e0-5b16491737e.html
A market strategist and an economic adviser discuss the financial consequences of Britain's decision to leave the European Union.
- Cameron Makes Pitch Against 'Brexit' - Video - NYTimes.com**
<https://www.nytimes.com/video/world/europe/100000004486690/brexit-is-irreversible-cameron-warns.html>
ce8e7b06-793e-4807-9c7a-dc11c0c58446.html
On Tuesday, speaking in front of No. 10 Downing Street, Prime Minister David Cameron of Britain made an appeal to older Britons to vote to stay in the European Union.

PageRank

Ubuntu-16.04 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

PHP Solr Client - Mozilla Firefox

PHP Solr Client

localhost/mySolr/?q=Brexit&sort=pageRankFile+desc

Search:

Ranking: ☐ Solr Default ☒ PageRank

Results 1 - 10 of 552:

1. **Neil Gaiman explora el muro de Odin en su nuevo libro de mitología - Español**
<https://www.nytimes.com/es/2017/02/15/neil-gaiman-explora-el-muro-de-odin-en-su-nuevo-libro-de-mitologia/030b7e7e-42cc-4e93-b366-de9bd8a3ac18.html>
2. **Europa - Español**
<https://www.nytimes.com/es/collection/europa/beda1406-193b-4814-a938-8f9457088226.html>
3. **Ecuador elige al sucesor de Rafael Correa después de una década - Español**
<https://www.nytimes.com/es/2017/02/13/ecuador-elige-al-sucesor-de-rafael-correa-despues-de-una-decada/997641bc-a4b3-4afa-9e13-7e45c965c3b8.html>
4. **Times Video - NYTimes.com**
<https://www.nytimes.com/video/f7908f3b-2a14-4094-bad3-687772888348.html>
Whether it's reporting on conflicts abroad and political divisions at home, or covering the latest style trends and scientific developments, Times Video journalists provide a revealing and unforgettable view of the world.
5. **El regreso de John Oliver: 'No soy totalmente nihilista' - Español**
<https://www.nytimes.com/es/2017/02/09/el-regreso-de-john-oliver-no-soy-totalmente-nihilista/41c9086e-af91-4136-99eb-18a89e890c97.html>
6. **Hillary Clinton - Español**
<https://www.nytimes.com/es/tag/hillary-clinton/0fb69598-a4a5-442f-8784-06fc643f5397.html>

Ubuntu-16.04 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

PHP Solr Client - Mozilla Firefox

PHP Solr Client

localhost/mySolr/?q=Brexit&sort=pageRankFile+desc

f7908f3b-2a14-4094-bad3-687772888348.html
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6. **Hillary Clinton - Español**
<https://www.nytimes.com/es/tag/hillary-clinton/0fb69598-a4a5-442f-8784-06fc643f5397.html>
7. **Cinco razones por las que la oposición podrá combatir a Trump - Español**
<https://www.nytimes.com/es/2017/02/06/cinco-razones-por-las-que-la-oposicion-podra-combatir-a-trump/24d21d3f-c6c1-4c9e-8b5a-24f945c14ba1.html>
8. **Economía - Español**
<https://www.nytimes.com/es/collection/economia/de6b266e-ec33-456e-a8b2-3bf3d9bb6b5.html>
9. **Marine Le Pen: 'La reciente decisión de los británicos fue una verdadera muestra de valor' - Español**
<https://www.nytimes.com/es/2016/06/30/marine-le-pen-la-reciente-decision-de-los-britanicos-fue-una-verdadera-muestra-de-valor/dac7248e-f314-4ed8-9689-17a4c72c12e9.html>
10. **Reseña: la inquietante nostalgia de 'T2 Trainspotting' - Español**
<https://www.nytimes.com/es/2017/01/30/resena-la-inquietante-nostalgia-de-t2-trainspotting/94411034-4f5a-425c-b8f6-211e3295b7db.html>