

# Building and Querying Semantic Layers for Web Archives

Pavlos Fafalios, Helge Holzmann, Vaibhav Kasturia, Wolfgang Nejdl

L3S Research Center, Hannover, Germany

{fafalios, holzmann, kasturia, nejdl}@l3s.de

## Comparative evaluation of effectiveness – List of information needs

| No. | Information Need   | Free-text query<br>(the date is manually specified<br>in each search system) | SPARQL QUERY   |
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| 1   | Find articles between 1998-06-01 and 1998-08-30 discussing about actors winners of an academy award for Best Actor | Best actor academy award winner  | <pre>PREFIX dc: &lt;http://purl.org/dc/terms/&gt; PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt; PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt; PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt; PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt; PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;  SELECT DISTINCT ?article ?title WHERE { SERVICE &lt;http://dbpedia.org/sparql&gt; { ?entityUri dc:subject dbc:Best_Actor_Academy_Award_winners ; dbo:birthPlace dbr:New_York }  ?article dc:date ?date FILTER (?date&gt;="1998-06-01"^^xsd:date &amp;&amp; ?date&lt;="1998-08-30"^^xsd:date) .  ?article oae:mentions ?entity . ?entity oae:hasMatchedURI ?entityUri . ?article dc:title ?title }</pre> |
| 2   | Find articles between 1989-07-01 and 1989-08-31 discussing about Los Angeles Lakers (NBA team) players             | Los Angeles Lakers player  | <pre>PREFIX dc: &lt;http://purl.org/dc/terms/&gt; PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt; PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt; PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt; PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt; PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;  SELECT DISTINCT ?article ?title WHERE { SERVICE &lt;http://dbpedia.org/sparql&gt; { ?entityUri dc:subject dbc:Los_Angeles_Lakers_players }  ?article dc:date ?date FILTER (?date&gt;="1989-07-01"^^xsd:date &amp;&amp; ?date&lt;="1989-08-31"^^xsd:date) .  ?article oae:mentions ?entity . ?entity oae:hasMatchedURI ?entityUri . ?article dc:title ?title }</pre>                                     |

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| 3 | Find articles of August 1992 discussing about African-American film producers                | African-American film producer | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?nylawyer dc:subject dbc:African-American_film_producers }<br/> ?article dc:date ?date FILTER (?date&gt;="1992-08-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1992-08-31"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?nylawyer .<br/> ?article dc:title ?title }</p> |
| 4 | Find articles Between 1990-01-05 and 1990-01-08 about drugs which act as stimulants          | Stimulant drugs                | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Stimulants }</p> <p>?article dc:date ?date FILTER (?date&gt;="1990-01-05"^^xsd:date &amp;&amp;<br/> ?date&lt;="1990-01-08"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>                  |
| 5 | Find articles between 1992-07-01 and 1992-09-20 discussing about Ferrari Formula One Drivers | Ferrari formula one drivers    | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Ferrari_Formula_One_drivers }</p> <p>?article dc:date ?date FILTER (?date&gt;="1992-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1992-09-20"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p> |

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| 6 | Find articles between 1989-07-05 and 1989-08-15 discussing about Assassinated Indian politicians | Assassinated Indian politicians | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Assassinated_Indian_politicians }</p> <p>?article dc:date ?date FILTER (?date&gt;="1989-07-05"^^xsd:date &amp;&amp;<br/> ?date&lt;="1989-08-15"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>                       |
| 7 | Find articles between 1990-06-01 and 1990-06-19 discussing about American Crime Thriller films   | American crime thriller films   | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:American_crime_thriller_films }</p> <p>?article dc:date ?date FILTER (?date&gt;="1990-06-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1990-06-19"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>                         |
| 8 | Find articles between 1989-07-01 and 1989-08-31 discussing about Boing 747 aircraft accidents    | boeing 747 aircraft accidents   | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject<br/> dbc:Accidents_and_incidents_involving_the_Boeing_747 }</p> <p>?article dc:date ?date FILTER (?date&gt;="1989-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1989-08-31"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p> |

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| 9  | Find articles between 1994-07-01 and 1994-09-18 discussing about Australian Cricketers who played One Day Internationals | Australian cricketers one day internationals | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Australia_One_Day_International_cricketers }<br/> <br/> ?article dc:date ?date FILTER (?date&gt;="1994-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1994-09-18"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>          |
| 10 | Find articles of 4 July 1995 discussing about companies listed on the New York Stock Exchange (NYSE)                     | Companies listed on NYSE                     | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject<br/> dbc:Companies_listed_on_the_New_York_Stock_Exchange}<br/> <br/> ?article dc:date ?date FILTER (?date&gt;="1995-07-04"^^xsd:date &amp;&amp;<br/> ?date&lt;="1995-07-04"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p> |
| 11 | Find articles between 1994-07-01 and 1994-08-15 discussing about Video-game consoles                                     | Video game consoles                          | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Home_video_game_consoles}<br/> <br/> ?article dc:date ?date FILTER (?date&gt;="1994-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1994-08-15"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>                             |

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| 12 | Find articles between 1992-07-01 and 1992-09-15 discussing about famous Indian personalities who received Padma Shri Award | Indian Padma Shri recipients | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Recipients_of_the_Padma_Shri}</p> <p>?article dc:date ?date FILTER (?date&gt;="1992-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1992-09-15"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>                                     |
| 13 | Find articles between 1993-07-01 and 1993-09-30 discussing about Bacterial Sexually Transmitted Diseases                   | Bacterial stds               | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject<br/> dbc:Infections_with_a_predominantly_sexual_mode_of_transmission}</p> <p>?article dc:date ?date FILTER (?date&gt;="1993-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1993-09-30"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p> |
| 14 | Find articles between 1989-07-01 and 1989-07-31 discussing about Operations of the Central Intelligence Agency(CIA)        | CIA operations               | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Central_Intelligence_Agency_operations}</p> <p>?article dc:date ?date FILTER (?date&gt;="1989-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1989-07-31"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>                           |

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| 15 | Find articles of 1 August 1998 mentioning Grammy Award Winners                              | grammy award winner | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Grammy_Award_winners}</p> <p>?article dc:date ?date FILTER (?date&gt;="1998-08-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1998-08-01"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p> |
| 16 | Find articles of the year 1989 discussing about Indian meat dishes                          | Indian meat dishes  | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Indian_meat_dishes}</p> <p>?article dc:date ?date FILTER (?date&gt;="1989-01-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1989-12-31"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>   |
| 17 | Find articles between 1994-07-01 and 1994-09-30 mentioning Mammalian Animals found in India | Indian mammals      | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Mammals_of_India}</p> <p>?article dc:date ?date FILTER (?date&gt;="1994-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1994-09-30"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>     |

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| 18 | Find articles between 1989-07-01 and 1989-07-10 mentioning US Fast Food Chains      | US fast food chains      | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Fast-food_chains_of_the_United_States}</p> <p>?article dc:date ?date FILTER (?date&gt;="1989-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1989-07-10"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p> |
| 19 | Find articles between 1997-07-01 and 1997-08-02 mentioning NASA civilian astronauts | nasa civilian astronauts | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:NASA_civilian_astronauts}</p> <p>?article dc:date ?date FILTER (?date&gt;="1997-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1997-08-02"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>              |
| 20 | Find articles between 1989-07-01 and 1989-08-15 discussing about Geological Hazards | geological hazard        | <p>PREFIX dc: &lt;http://purl.org/dc/terms/&gt;<br/> PREFIX oae: &lt;http://www.ics.forth.gr/isl/oae/core#&gt;<br/> PREFIX dbc: &lt;http://dbpedia.org/resource/Category:&gt;<br/> PREFIX xsd: &lt;http://www.w3.org/2001/XMLSchema#&gt;<br/> PREFIX dbo: &lt;http://dbpedia.org/ontology/&gt;<br/> PREFIX dbr: &lt;http://dbpedia.org/resource/&gt;</p> <p>SELECT DISTINCT ?article ?title WHERE {<br/> SERVICE &lt;http://dbpedia.org/sparql&gt; {<br/> ?entityUri dc:subject dbc:Geological_hazards}</p> <p>?article dc:date ?date FILTER (?date&gt;="1989-07-01"^^xsd:date &amp;&amp;<br/> ?date&lt;="1989-08-15"^^xsd:date) .<br/> ?article oae:mentions ?entity .<br/> ?entity oae:hasMatchedURI ?entityUri .<br/> ?article dc:title ?title }</p>                    |