

动手体验

关联数据与开放数据

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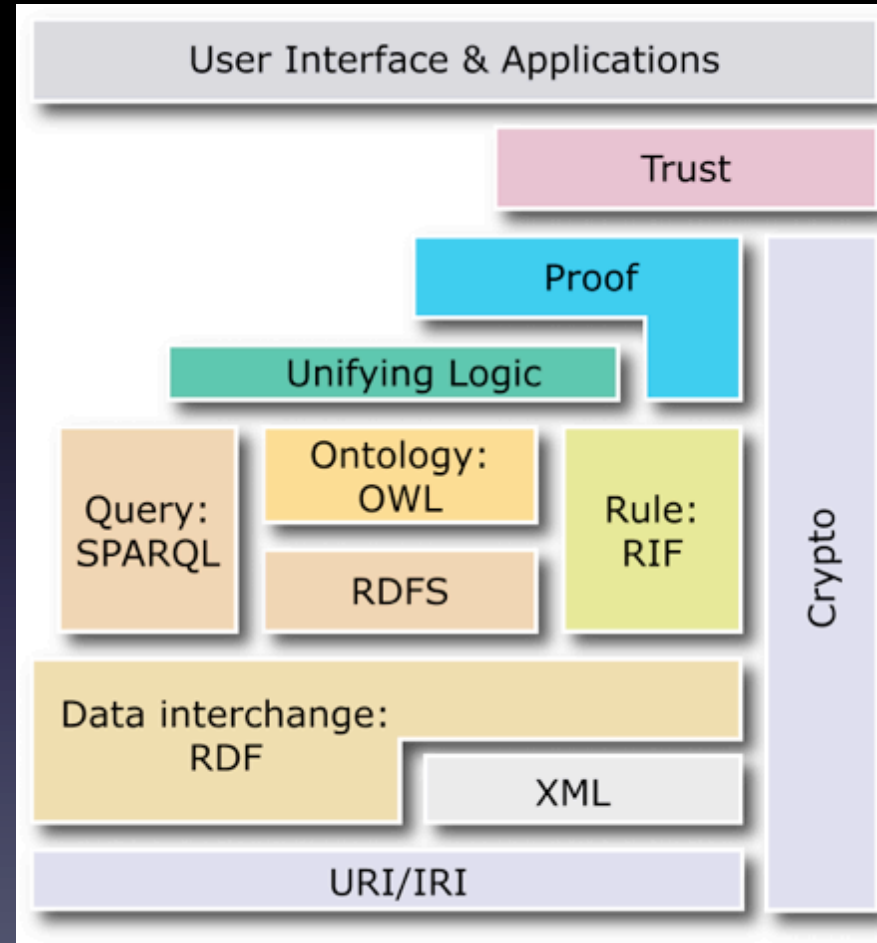
2015年七月

Five Steps to Become A Linked Data Librarian

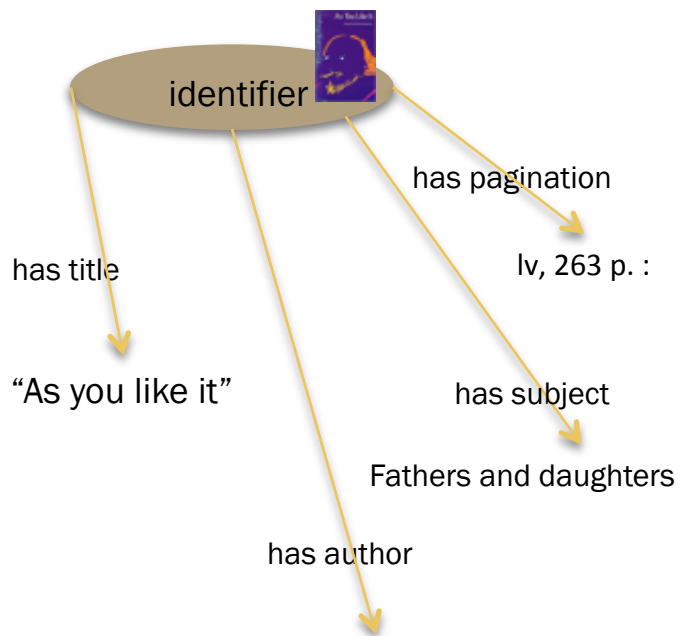
- 第1步：阅读和理解RDF数据
- 第2步：验证RDF数据，转换格式
- 第3步：学习和探索SPARQL查询
- 第4步：探索可链接数据接口和API
- 第5步：数据再处理/可视化

第1步：阅读和理解RDF数据

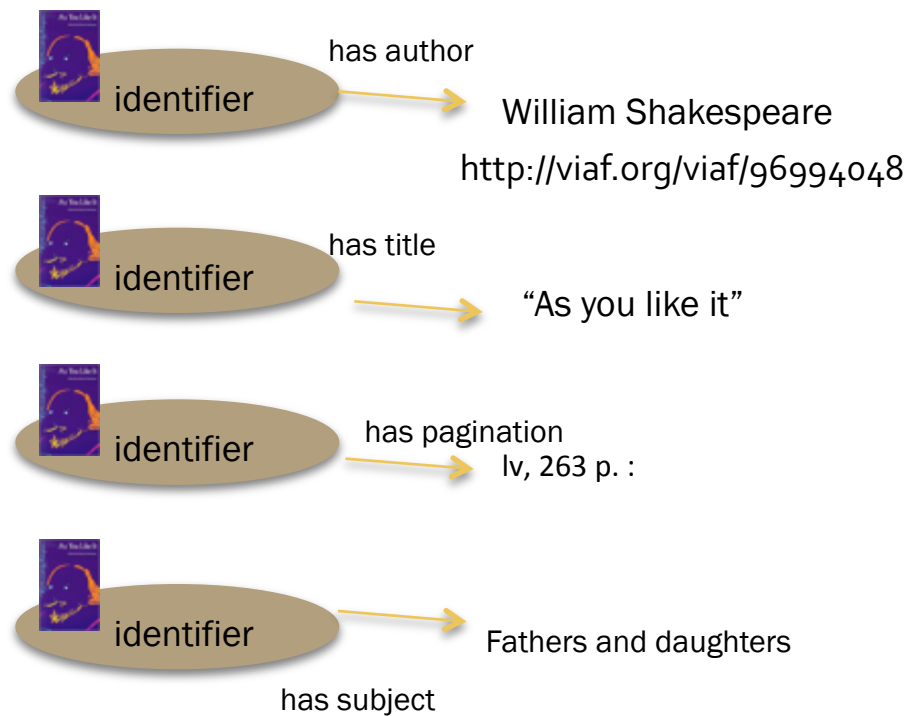
- XML
 - It's a language, a standard, and a technology.
 - It's a tool to label, organize, and represent document content.
 - It's both human- and machine-readable.
- RDF
 - It describes relationships through triples:
 - Subject -- Predicate -- Object
 - 主语 —— 谓语 —— 对象 (宾语)
 - RDF statements can be described in a graph.
 - Expressed in different syntaxes, including XML, plain text, n-triples, etc. (RDF/XML is one of them.)



GRAPH



TRIPLES



要把‘记录’打开了，就能联接现成的数据(示意)

比如，将作者名称字符串换成其VIAF的URI—》

动手 1

a. 创建和读取一个RDF文件，并绘制它的graph。

```
- <rdf:RDF>
- <foaf:Person rdf:about="http://www.w3.org/People/EM/contact#me">
  <rdf:value>Eric Miller, em@w3.org</rdf:value>
  <foaf:name>Eric Miller</foaf:name>
  <foaf:phone rdf:resource="tel:+1-(617)-258-5714"/>
  <foaf:mbox rdf:resource="mailto:em@w3.org"/>
  <foaf:nick>em</foaf:nick>
  <foaf:img rdf:resource="http://www.w3.org/People/EM/s000782.JPG"/>
  <foaf:workInfoHomepage rdf:resource="http://www.w3.org/People/EM"/>
  <foaf:workplaceHomepage rdf:resource="http://www.w3.org"/>
- <contact:office>
  - <contact:contactLocation>
    <rdf:value>MIT CSAIL</rdf:value>
    <contact:homePage rdf:resource="http://csail.mit.edu"/>
  - <contact:address>
    - <contact:Address>
      - <rdf:value>
        The Stata Center, Building 32-G516, 32 Vassar Street, Cambridge MA 02139
      </rdf:value>
      <contact:city>Cambridge</contact:city>
      <contact:country>USA</contact:country>
      <contact:postalCode>02139</contact:postalCode>
    - <contact:street>
      The Stata Center, Building 32-G516, 32 Vassar Street
    </contact:street>
    <loc:coordinates>42.361860,-71.091840</loc:coordinates>
    </contact:Address>
  </contact:address>
  </contact:contactLocation>
</contact:office>
<foaf:knows rdf:resource="http://www.w3.org/People/Berners-Lee/card#i"/>
<foaf:knows rdf:resource="http://www.w3.org/People/Connolly/#me"/>
<foaf:knows rdf:resource="http://www.w3.org/People/djweitzner/public/foaf.rdf#DJW"/>
</foaf:Person>
- <rdf:Description rdf:about="http://dig.csail.mit.edu/data#DIG">
  <rdf:value>Decentralized Information Group</rdf:value>
  <foaf:member rdf:resource="http://www.w3.org/People/EM/contact#me"/>
</rdf:Description>
- <rdf:Description rdf:about="http://www.w3.org/People/Connolly/#me">
  <rdf:value>Dan Connolly</rdf:value>
  <rdfs:seeAlso rdf:resource="http://www.w3.org/People/Connolly/home-smart.rdf"/>
</rdf:Description>
- <rdf:Description rdf:about="http://www.w3.org/People/Berners-Lee/card#i">
  <rdf:value>Tim Berners-Lee</rdf:value>
  <rdfs:seeAlso rdf:resource="http://www.w3.org/People/Berners-Lee/card"/>
</rdf:Description>
- <rdf:Description rdf:about="http://www.w3.org/People/djweitzner/public/foaf.rdf#DJW">
  <rdf:value>Danny Weitzner</rdf:value>
  <rdfs:seeAlso rdf:resource="http://www.w3.org/People/djweitzner/public/foaf"/>
</rdf:Description>
</rdf:RDF>
```

<http://www.w3.org/People/EM/contact>

<http://www.w3.org/People/EM/contact>

动手2：创建你的FOAF文件

也许这是你的第一个RDF文件...

- 转至工具
- <http://www.ldodds.com/foaf/foaf-a-matic.html>
- 填几个字段，加1或2个朋友，生成FOAF文件！

The Forms

Personal

Some information about you, and how people can contact you.

Title (Mr, Mrs, Dr, etc)	<input type="text"/>
First Name	<input type="text"/>
Last Name (Family/Given)	<input type="text"/>
Nickname	<input type="text"/>
Your Email Address	<input type="text"/>
Homepage	<input type="text"/>
Your Picture	<input type="text"/>
Phone Number	<input type="text"/>

← www.ldodds.com/foaf/foaf-a-matic.zh-tw.html

表單

個人資訊

某些你個人的資訊，以及其他如何和你聯絡。

稱謂 (Mr, Mrs, Dr, etc)	<input type="text"/>
名字	<input type="text"/>
姓 (Family/Given)	<input type="text"/>
暱稱	<input type="text"/>
電子郵件地址	<input type="text"/>
首頁	<input type="text"/>
你的照片	<input type="text"/>
電話號碼	<input type="text"/>

工作資訊

關於你工作所在的資訊。

工作所在首頁	<input type="text"/>
在你的工作網絡中的介紹網頁	<input type="text"/>

學校

你是哪裡畢業的？

學校首頁	<input type="text"/>
------	----------------------

你所認識的朋友

告訴 FOAF-a-matic 你所認識的朋友。按下「加入更多朋友」，可以增加空白欄位，輸入更多你所認識朋友。「SeeAlso」的欄位中。

Friend-- Name	<input type="text"/>	Email	<input type="text"/>	See Also	<input type="text"/>
Friend-- Name	<input type="text"/>	Email	<input type="text"/>	See Also	<input type="text"/>

```
<rdf:RDF>
- <foaf:Person rdf:about="http://www.w3.org/People/EM/contact#me">
  <rdf:value>Eric Miller, em@w3.org</rdf:value>
  <foaf:name>Eric Miller</foaf:name>
  <foaf:phone rdf:resource="tel:+1-(617)-258-5714"/>
  <foaf:mbox rdf:resource="mailto:em@w3.org"/>
  <foaf:nick>em</foaf:nick>
  <foaf:img rdf:resource="http://www.w3.org/People/EM/000782.JPG"/>
  <foaf:workspaceHome rdf:resource="http://www.w3.org/People/EM"/>
  <foaf:workplaceHomepage rdf:resource="http://www.w3.org"/>
- <contact:office>
  - <contact:contactLocation>
    <rdf:value>MIT CSAIL</rdf:value>
    <contact:homePage rdf:resource="http://csail.mit.edu"/>
  - <contact:address>
    - <contact:Address>
      - <rdf:value>
        The Stata Center, Building 32-G516, 32 Vassar Street, Cambridge MA 02139
      </rdf:value>
      <contact:city>Cambridge</contact:city>
      <contact:country>USA</contact:country>
      <contact:postalCode>02139</contact:postalCode>
    - <contact:street>
      The Stata Center, Building 32-G516, 32 Vassar Street
    </contact:street>
    <loc:coordinates>42.361860,-71.091840</loc:coordinates>
  </contact:Address>
</contact:address>
</contact:contactLocation>
</contact:office>
<foaf:knows rdf:resource="http://www.w3.org/People/Berners-Lee/card#i"/>
<foaf:knows rdf:resource="http://www.w3.org/People/Connolly/#me"/>
<foaf:knows rdf:resource="http://www.w3.org/People/djweitzner/public/foaf.rdf#DJW"/>
</foaf:Person>
- <rdf:Description rdf:about="http://dig.csail.mit.edu/data#DIG">
  <rdf:value>Decentralized Information Group</rdf:value>
  <foaf:member rdf:resource="http://www.w3.org/People/EM/contact#me"/>
</rdf:Description>
- <rdf:Description rdf:about="http://www.w3.org/People/Connolly/#me">
  <rdf:value>Dan Connolly</rdf:value>
  <rdfs:seeAlso rdf:resource="http://www.w3.org/People/Connolly/home-smart.rdf"/>
</rdf:Description>
- <rdf:Description rdf:about="http://www.w3.org/People/Berners-Lee/card#i">
  <rdf:value>Tim Berners-Lee</rdf:value>
  <rdfs:seeAlso rdf:resource="http://www.w3.org/People/Berners-Lee/card"/>
</rdf:Description>
- <rdf:Description rdf:about="http://www.w3.org/People/djweitzner/public/foaf.rdf#DJW">
  <rdf:value>Danny Weitzner</rdf:value>
  <rdfs:seeAlso rdf:resource="http://www.w3.org/People/djweitzner/public/foaf"/>
</rdf:Description>
</rdf:RDF>
```

阅读RDF/XML文件
并解释:

你的姓氏如何编码
的?

你的朋友如何被编
码为朋友的?

第2步：验证RDF数据、转换格式

动手2

1. 转到<http://www.w3.org/RDF/Validator>
2. 粘贴你的FOAF RDF文档
3. 选择“triples and graph”
4. 点击“Parse RDF”

www.w3.org/RDF/Validator/

Validation Service

[Skip Navigation](#) [Home](#)
[Documentation](#)
[Feedback](#)

Check and Visualize your RDF documents

[olde servlet](#)

Enter a URI or paste an RDF/XML document into the text field above. A 3-tuple (triple) representation of the corresponding data model as well as an optional graphical visualization of the data model will be displayed.

Check by Direct Input

```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:admin="http://webns.net/mvcb/"
  <foaf:PersonalProfileDocument rdf:about="">
  <foaf:maker rdf:resource="#me"/>
  <foaf:primaryTopic rdf:resource="#me"/>
  <admin:generatorAgent rdf:resource="http://www.ldodds.com/foaf/foaf-
  natic"/>
  <admin:errorReportsTo rdf:resource="mailto:leich@ldodds.com"/>
```

Parse RDF Restore the original example Clear the textarea

Display Result Options

Triples and/or Graph: Triples and Graph
Graph format: PN - e

Paste an RDF/XML document into the following text field to have it checked. More options are available in the [Extended interface](#).



现在，看一下效果：

- 验证正确吗？
- 你有没有可视化的关系？

一些提示：

如果引号不是纯文本，计算机不能处理的！

6	http://www.w3.org/RDF/Validator/run/1435263454857#MarciaZeng	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://xmlns.com/foaf/0.1/Person
7	http://www.w3.org/RDF/Validator/run/1435263454857#MarciaZeng	http://xmlns.com/foaf/0.1/name	"Marcia Lei Zeng"
8	http://www.w3.org/RDF/Validator/run/1435263454857#MarciaZeng	http://xmlns.com/foaf/0.1/title	"Dr."
9	http://www.w3.org/RDF/Validator/run/1435263454857#MarciaZeng	http://xmlns.com/foaf/0.1/givenname	"Marcia Lei"
10	http://www.w3.org/RDF/Validator/run/1435263454857#MarciaZeng	http://xmlns.com/foaf/0.1/family_name	"Zeng"
11	http://www.w3.org/RDF/Validator/run/1435263454857#MarciaZeng	http://xmlns.com/foaf/0.1/nick	"Marcia"
12	http://www.w3.org/RDF/Validator/run/1435263454857#MarciaZeng	http://xmlns.com/foaf/0.1/mbox_shalsum	"84505ea338816e50cce9117d0f00bea2b0b725d1"
13	http://www.w3.org/RDF/Validator/run/1435263454857#MarciaZeng	http://xmlns.com/foaf/0.1/homepage	http://marciazeng.slis.kent.edu/

www.easyrdf.org/converter

EASY RDF Documentation Examples Converter Support Downloads

Converter

Input Data:

```
<foaf:knows>
<foaf:Person>
<foaf:name>Jeff Mixer</foaf:name>
<foaf:mbox_sha1sum>01d5b638538431cfad61167732d9076340e5a31
8</foaf:mbox_sha1sum>
<rdfs:seeAlso rdf:resource="http://oclc.org/research/people
/mixer.html"/></foaf:Person></foaf:knows></foaf:Person>
</rdf:RDF>
```

or Uri:

http://njh.me/

Input Format:

Guess

Output Format:

Turtle Terse RDF Triple Language

RDF/PHP

RDF/JSON Resource-Centric

JSON-LD

N-Triples

Turtle Terse RDF Triple Language

RDF/XML

Graphviz

Notation3

Portable Network Graphics (PNG)

Clear Submit

RDF 有很多种格式，不要怕，那是机器的任务

试试：如果你将你做的FOAF文件放到这里，可以转换成很多格式

<http://www.easyrdf.org/converter>



简·奥斯汀 规范文档 格式1

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:schema="http://schema.org">
<rdf:Description rdf:about="http://viaf.org/viaf/102333412">
<rdf:type rdf:resource="http://schema.org/Person"/>
<schema:name>Austen, Jane.</schema:name>
<schema:familyName>Austen</schema:familyName>
<schema:givenName>Jane</schema:givenName>
</rdf:Description>
</rdf:RDF>
```

机器直接转成格式2:

```
@prefix schema: <http://schema.org/> .
<http://viaf.org/viaf/102333412>
a schema:Person ;
schema:name "Austen, Jane." ;
schema:familyName "Austen" ;
schema:givenName "Jane" .
```

第3步:学习和探索SPARQL查询

- SPARQL是关联数据的查询语言，W3C推荐标准
 - 从结构化和半结构化数据中取值
 - 通过提问未知关系来探索数据
 - 用简单的提问式来建立复杂的、跨数据库的联结
 - 将RDF数据从一种数据模型的词汇转换成另一种词汇
- SPARQL提问式是针对有RDF graphs的RDF数据集来操作。

- SPARQL:

- 看上去非常复杂，用起来非常方便
- 具体的应用经常要写很复杂、很长的提问式
- 提问式可以事先准备好范例，通过界面操控（如Getty AAT等）
- 提问式也可以藏在幕后，界面只是各种选项
- 还可以提供生成提问式的工具（下面我们会有一个）

```
PREFIX dataset: <http://dbpedia.org/ontology/>
SELECT ?uri ?influencedBy
WHERE
{
  {
    ?uri a dataset:Artist .
    ?uri dataset:influencedBy ?influencedBy .
    filter regex(?influencedBy, 'Pablo_Picasso', 'i') .
  }
  UNION
  {
    ?uri a dataset:Artist .
    ?uri dataset:influencedBy ?influencedBy .
    filter regex(?influencedBy, 'Henri_Matisse', 'i') .
  }
}
```

有许多实用的关联数据 Sparql Endpoint 可供练习

- <http://demo.openlinksw.com/sparql>
- <http://dbpedia.org/sparql>
- <http://drugbank.bio2rdf.org/sparql>
- <http://sparql.org/sparql.html>

演示: OpenLink Virtuoso

- Open: <http://demo.openlinksw.com/sparql>
- Run your first SPARQL query:

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>

SELECT ?name

WHERE {
  ?person      foaf:name      ?name .
}
```

- Limit to this dataset:
 - <http://dig.csail.mit.edu/2008/webdav/timbl/foaf.rdf>
- Limit to our dataset?

演示：Dbpedia

- 采用Sparql提问式从dbpedia中获取数据，然后可视化
- <http://dbpedia.org/sparql>

动手3：做一SPARQL提问式

Go to: <http://marciazeng.slis.kent.edu/metadata/sparqlTemp.html>

如果你不是一个日常SPARQL语言用户，可能做提问式不是那么容易。

所以，我们创建了一个工具。

SPARQL Query Creator [Beta]

This tool is built for generating SPARQL queries in order to obtain data from DBpedia. The tool aims to help to aggregate data for research and re-use purposes.

The following template will allow you to generate a query related to the 'influencedBy' and 'influenced' properties in the template are classes defined by DBpedia Ontology. Data sources are what DBpedia have covered (i.e., w

For example, we can try to find (1) all artists who were born in Spain; (2) Among the artists who influence This can be further limited by particular artists, for example, (3) those who were influenced by Pablo_P Henri_Matisse.

You may follow the generated query text to create your own query/queries by placing other categories, proper

Select Category* (please select:)

(Note: Consult <http://mappings.dbpedia.org/server/ontology/classes/> for other Classes.)

Filter by Birth Place
& Select Birth Place (please select:)

Use filter: Influenced By | Influenced | Do not use influence filter

- Further filter according to individuals**
 - Name 1**
E.g., Pablo_Picasso (Note: Name must be exactly same as that in dbpedia or wikipedia URI. See Picasso http://en.wikipedia.org/wiki/Pablo_Picasso.)
 - Name 2 (optional)**
E.g., Henri_Matisse

Select Category*

(Note: Consult <http://mappings.dbpedia.org/server/ontology/classes/> for other Classes.)

Filter by Birth Place

& Select Birth Place

Use filter: Influenced By Influenced Do not use influence filter

• Further filter according to individuals

◦ Name 1
E.g., Pablo_Picasso (Note: Name must be exactly same as that in dbpedia or wikipedia
http://dbpedia.org/page/Pablo_Picasso or http://en.wikipedia.org/wiki/Pablo_Picasso.)

◦ Name 2 (optional)
E.g., Henri_Matisse

Limit Number of Results

Output data will contain :

URI
 Name

* = required

步骤：
在模板中选项。下
面是这个演示的查
询将用于：

从“艺术家”类别中，
发现，

谁是受XXX影响的
人。XXX如：
毕加索Picasso和
马蒂斯Matisse

输出数据将包含艺
术家的URI

Submit

将拿到的SPARQL提问公式copy—paste到DBpedia's end point

<http://dbpedia.org/sparql>

```
PREFIX dataset: <http://dbpedia.org/ontology/>
SELECT ?uri ?influencedBy
WHERE
{
  {
    ?uri a dataset:Artist .
    ?uri dataset:influencedBy ?influencedBy .
    filter regex(?influencedBy, 'Pablo_Picasso', 'i') .
  }
  UNION
  {
    ?uri a dataset:Artist .
    ?uri dataset:influencedBy ?influencedBy .
    filter regex(?influencedBy, 'Henri_Matisse', 'i') .
  }
}
```

将这个box清理干净，然后paste

先选html看看，然后选CSV格式存档。之后便可以到Gephi去做图像了

dbpedia.org/sparql?default-graph-uri=http%3A%2F%2Fdbpedia.org&query=PREL

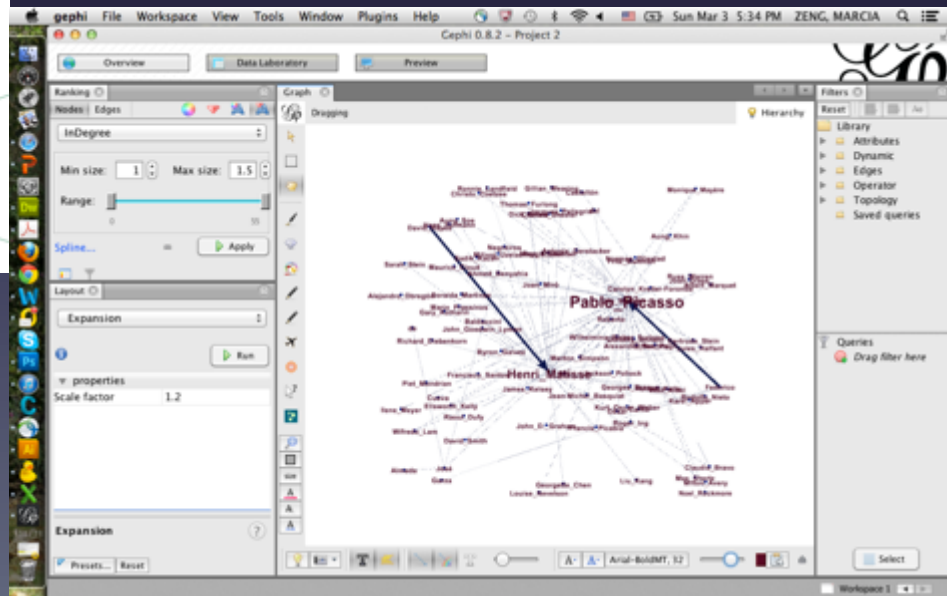
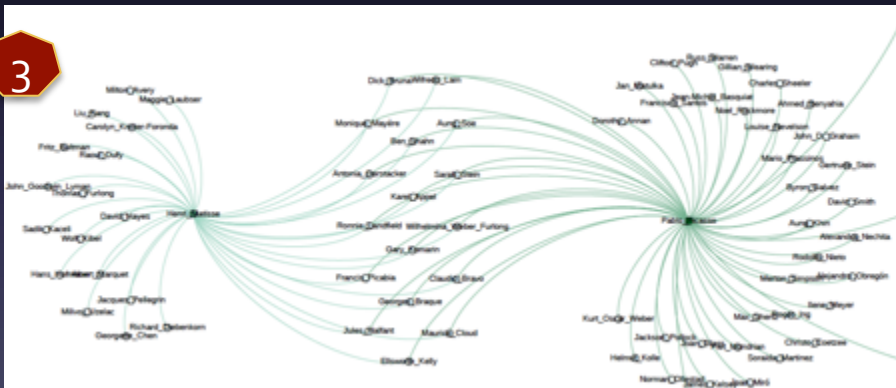
2

uri	influencedBy
http://dbpedia.org/resource/Ellsworth_Kelly	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/Raoul_Dufy	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/Karel_Appel	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/Ben_Shahn	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/Dick_Bruna	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/Wifredo_Lam	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/Richard_Diebenkorn	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/Milton_Avery	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/David_Hayes_(sculptor)	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/Maggie_Laubser	http://dbpedia.org/resource/Henri_Matisse
http://dbpedia.org/resource/Sadik_Kaceli	http://dbpedia.org/resource/Henri_Matisse

应该有这种结果

以后可对部分结果用GEPHI工具来对结果进行可视化

3



Tip: Follow *Gephi Tutorial Quick Start*
http://gephi.org/tutorials/gephi-tutorial-quick_start.pdf

第4步：探索可链接数据接口和API

- <http://vocab.getty.edu/queries>

到Getty LOD 艺术与建筑叙词表、地理名称叙词表、艺术家人名规范文档获取知识性数据

动手4 : Getty LOD <http://vocab.getty.edu/queries>

[4.11 Members of the European Union](#)

[4.12 Members of the United Nations](#)

[5.2 Associative Relations of Agent](#) 找500010879 (Leonardo da Vinci)

The screenshot shows the Getty Vocabularies: LOD SPARQL Queries interface. The left sidebar contains a list of queries, with '2.2 Descendants of a Given Parent' highlighted and circled with a '1'. A red box with the text '1. Choose a question & see the template' points to this query. The main area shows the query template for '2.2 Descendants of a Given Parent', with a red box containing the text '2. In the query template, fill in with the concept ID, ask to get all descendants of this concept with labels. -- Submit.' pointing to the query input field. The query input field contains the following SPARQL query:

```
1 select * {?x gvp:broaderExtended aat:300117143; skos:inScheme aat: ;
2 gvp:prefLabelGVP/xl:literalForm ?l}
```

 Below the query input field, there are checkboxes for 'Include inferred' (checked) and 'Expand results over equivalent URIs' (unchecked). A 'Submit' button is visible. The results section shows the title '2.2 Descendants of a Given Parent' and a description: 'Let's look for AAT descendants of 300194567 "drinking vessels". This finds "rhyta" and other interesting records, including "Fichtelgebirgehumpen":'. Below the description, there is a query input field with the following SPARQL query:

```
select * {?x gvp:broaderExtended aat:300194567; skos:inScheme aat: ; gvp:prefLabelGVP/xl:literalForm
?l}
```

 At the bottom, a red box with the text '3. Download the results' points to the 'Download SPARQL Results in:' section, which offers options for JSON, XML, CSV, and TSV. Below this, a table shows the results for the query:

x	l
aat:300391302	communion wafers@en
aat:300391224	Advent wreaths@en
aat:300264822	Christmas trees@en

动手 5

- Identify a domain of your interest and find a LOV or SPARQL endpoint for the domain
- Today: work with the RomanCoins exercise
- Demo: 古代罗马硬币研究网站 Online Coins of the Roman Empire (OCRE)
- <http://numismatics.org/ocre/>

Data Options



Keyword

Search input field with magnifying glass icon

Refine Results

Authority dropdown menu

Deity dropdown menu

Denomination dropdown menu

Findspot dropdown menu

Issuer dropdown menu

Manufacture dropdown menu

Material dropdown menu

Mint dropdown menu

Object Type dropdown menu

Portrait dropdown menu

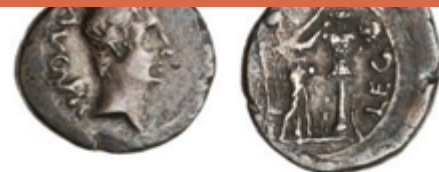
All Terms Map Results

Displaying records 1 to 20 of 23262 total results

Select from List dropdown and Ascending sort order

RIC I (second edition) Augustus 1A

Date 25 BC - 23 BC
Denomination Quinarius
Mint Emerita
Obverse AVGVST: Head of Augustus, bare, left
Reverse P CARISI LEG: Victory standing right, placing wreath on trophy with dagger and sword at base



objects: 12; hoard: 1

RIC I (second edition) Augustus 1B

Date 25 BC - 23 BC
Denomination Quinarius
Mint Emerita
Obverse AVGVST: Head of Augustus, bare, left
Reverse P CARISI LEG: Victory standing right, placing wreath on trophy with dagger and sword at base



objects: 13

RIC I (second edition) Augustus 2A

Date 25 BC - 23 BC

古代罗马硬币研究网站 Online Coins of the Roman Empire (OCRE)

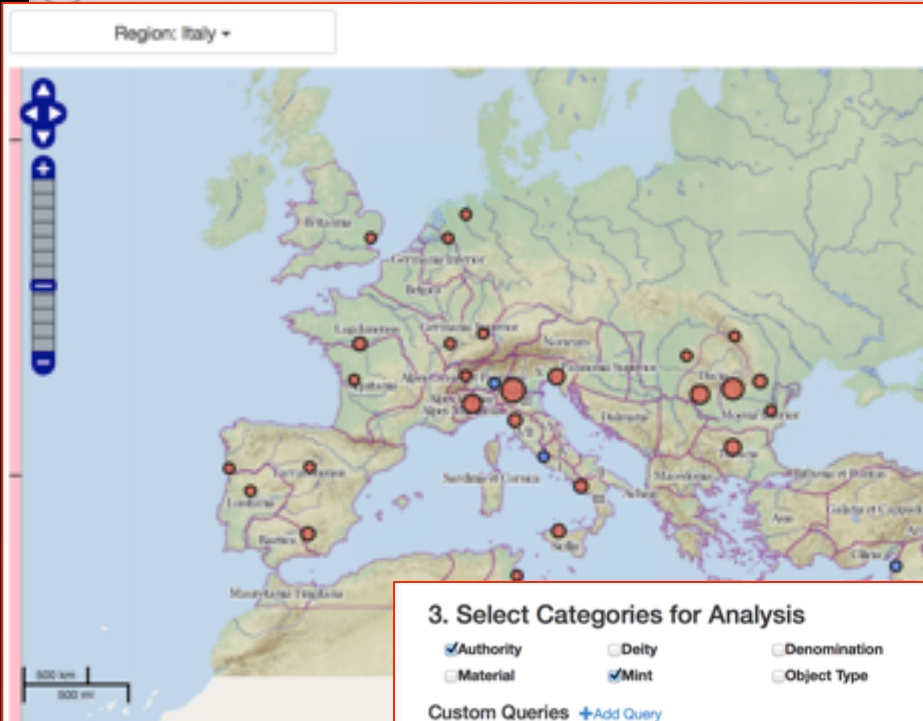
<http://numismatics.org/ocre/>

本体构建，多种属性描述的目录；在后端数据为RDF三段式形式，完全用SPARQL提问公式支撑。

用户在前端用多种选择形式和可视的分面、过滤功能查找，浏览

也可以直接看统计分析结果、地理分布等。

(本体构建，多种属性描述的目录；在后端数据为RDF三段式形式，完全用SPARQL提问公式支撑。)



3. Select Categories for Analysis

- Authority
- Deity
- Denomination
- Findspot
- Issuer
- Manufacture
- Material
- Mint
- Object Type
- Portrait
- Region

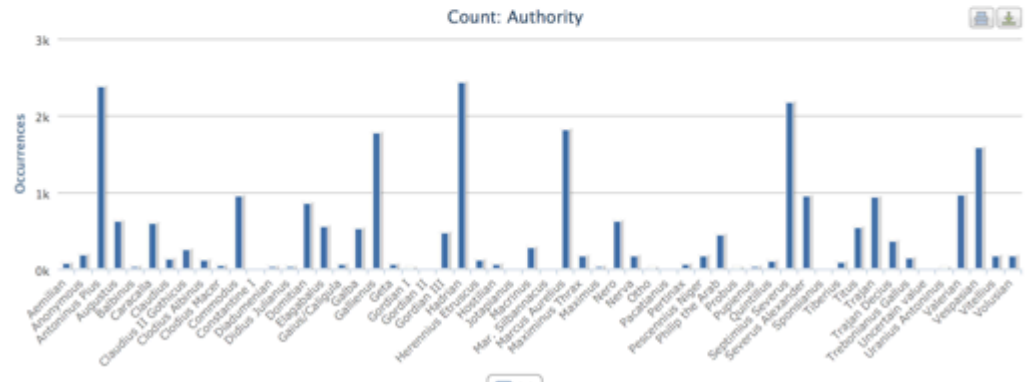
Custom Queries [+Add Query](#)

4. Compare Queries [+Add Query](#)

Comparison Query: "*" [X Remove Query](#)

Optional Settings [Hide/Show Options](#)

Generate Chart



objects: 12; hoard: 1



objects: 13

SPARQL Query

For examples, see [SPARQL Examples](#)

```
PREFIX nm: <http://nomisma.org/id/>
PREFIX nmo: <http://nomisma.org/ontology#>
PREFIX dcterms: <http://purl.org/dc/terms/>
PREFIX skos: <http://www.w3.org/2004/02/skos/core#>

SELECT ?label (count(?mint) as ?count) WHERE {
  ?types nmo:hasMaterial nm:ar ;
  dcterms:source nm:rrc ;
  nmo:hasMint ?mint .
  ?mint skos:prefLabel ?label .
  FILTER langMatches(lang(?label), "en")
} GROUP BY ?label ORDER by ?label
```

Output

CSV

Submit

练习：将SPARQL提问公式在end point上交后，获取数据构建者为了讲解SPARQL提供了一些sparql公式源码。

总体过程：

1. 你可以上

<https://gist.github.com/ewg118/c854c94c3ed8fdoaf898>

获取以下sparql公式内容，（或者见本ppt的下一页）

2. 然后copy—paste放到这里的endpoint

<http://nomisma.org/sparql>，以便在此获取数据。

这个提问是要索取：古代罗马 Republican coinage 发行的硬币的种类数，并按照硬币英语名称分组和排序

3. 先看看HTML出来的结果，然后重新存成CSV文档。

第1个例子. 古代罗马Republican coinage 发行的硬币的种类数, 并按照硬币英语名称分组和排序

《 — 从下面开始 copy — 》

```
PREFIX nm: <http://nomisma.org/id/>
PREFIX nmo: <http://nomisma.org/ontology#>
PREFIX dcterms: <http://purl.org/dc/terms/>
PREFIX skos: <http://www.w3.org/2004/02/skos/core#>

SELECT ?label (count(?mint) as ?count) WHERE {
?types nmo:hasMaterial nm:ar ;
dcterms:source nm:rrc ;
nmo:hasMint ?mint .
?mint skos:prefLabel ?label .
FILTER langMatches(lang(?label), "en")
} GROUP BY ?label ORDER by ?label
```

<--结束 -->

具体操作步骤:

1. 将第1个例子的语句 copy — paste 到 <http://nomisma.org/sparql>
2. 先看看HTML出来的结果
3. 然后选 CSV 文件格式, 存档。
4. 如果打开文件, 应该像 spreadsheet

下面你就可以用其它工具来看数据了。比如说, google Fusion Table

5. Log in at <https://www.google.com/fusiontables/data?dsrclid=implicit> (需要有 Google 账号)
6. 上传你刚存在来的 csv 文件, 做成新的 Fusion Table
7. Table 做好后, 选择添加图示来看结果。

2. copy—paste放到这里的endpoint <http://nomisma.org/sparql>，以便在此获取数据。

SPARQL Query

For examples, see [SPARQL Examples](#). A basic tutorial on SPARQL is available from [Apache Jena](#).

```

PREFIX nm: <http://nomisma.org/id/>
PREFIX nmo: <http://nomisma.org/ontology#>
PREFIX dcterms: <http://purl.org/dc/terms/>
PREFIX skos: <http://www.w3.org/2004/02/skos/core#>

SELECT ?label (count(?mint) as ?count) WHERE {
?types nmo:hasMaterial nm:ar ;
dcterms:source nm:rrc ;
nmo:hasMint ?mint .
?mint skos:prefLabel ?label .
FILTER langMatches(lang(?label), "en")
} GROUP BY ?label ORDER by ?label

```

这个提问是要索取：古代罗马 Republican coinage 发行的硬币的种类数，并按照硬币英语名称分组和排序

Output

CSV

Submit

3. 先看看HTML出来的结果，
4. 然后重新存成CSV文档。

5. 到 Google 做 Fusion Table 融合表。
Log in at <https://www.google.com/fusiontables/data?dsrclid=implicit>
(需要有 Google 账号)



Fusion Tables Help

Fusion Tables is an [experimental app](#).

About Fusion Tables

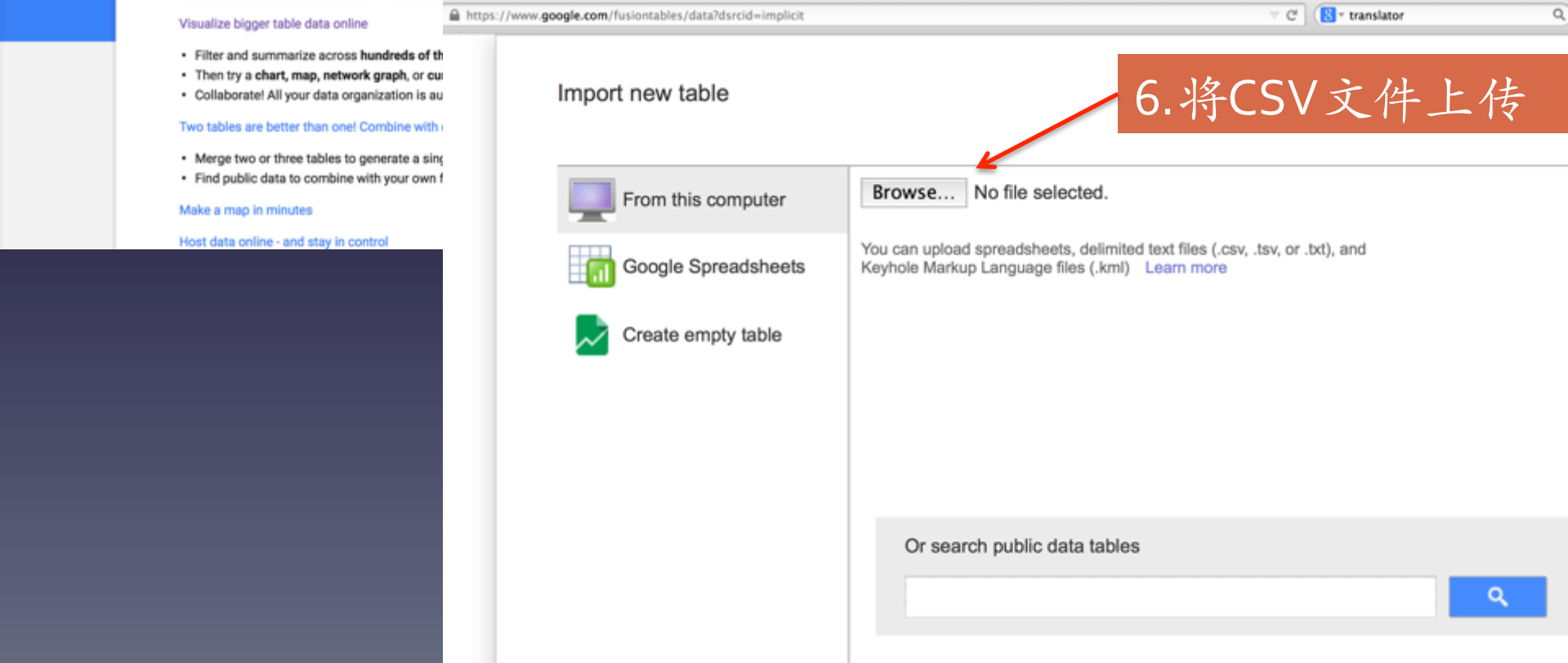
Bust your data out of its silo!
Get more from data with Fusion Tables.

Fusion Tables is an experimental data visualization web application to gather, visualize, and share data tables.

[CREATE A FUSION TABLE](#) [GET THE DRIVE APP](#)

[New features](#)
[About Fusion Tables API](#)

6. 将 CSV 文件上传



Import new table

[From this computer](#) [Browse...](#) No file selected.

You can upload spreadsheets, delimited text files (.csv, .tsv, or .txt), and Keyhole Markup Language files (.kml) [Learn more](#)

[Google Spreadsheets](#)

[Create empty table](#)

Or search public data tables

mints that issued silver Republican coinage

Display mints that issued silver Republican coinage, with count of types, grouped and order by mint ...

Edited at 12:56 AM

File Edit Tools Help

Rows 1

Cards 1



Filter

No filters applied

1-29 of 29

label	count
Africa	12
Apollonia Mordiaem	5
Apulia	11
Campania	1
Corcyra	2
Cyrenaica	12
Eastern Roman Mint	2
Etruria	12
Gallia Cisalpina	10
Hispania	18
Italy	21

7. Google 融合表 可以有各种输出。

如果你还想试一个，那么就做
第二个例子. Visualize Greek coin production. 希腊硬币生产可视图
source: <https://gist.github.com/ewg118/7eb155ed8gfo4219afof>

<!--从下面开始拷贝第2个例子 -->

```
PREFIX dcterms:      <http://purl.org/dc/terms/>
PREFIX geo: <http://www.w3.org/2003/01/geo/
wgs84_pos#>
PREFIX nm: <http://nomisma.org/id/>
PREFIX nmo: <http://nomisma.org/ontology#>
PREFIX skos: <http://www.w3.org/2004/02/skos/core#>

SELECT ?label ?lat ?long WHERE {
?mints a nmo:Mint ;
  skos:prefLabel ?label ;
  dcterms:isPartOf nm:greek_numismatics ;
  geo:location ?loc .
?loc geo:lat ?lat ;
  geo:long ?long
FILTER langMatches( lang(?label), "en" )
}
```

<--结束 -->

具体步骤:

- 1.将例子的语句拷贝到 <http://nomisma.org/sparql> , past the query.
- 2.先看看HTNML出来的结果
- 3.然后选 CSV 文件格式, 存档。
- 4.如果打开文件, 应该像 spreadsheet 下面你就可以用其它工具来看数据了。比如说, google Fusion Table
5. Log in at <https://www.google.com/fusiontables/data?dsrcid=implicit> (需要有Google账号)
- 6.上传你刚存在来的csv 文件, 做成新的 Fusion Table
- 7.选择加一种地图, 根据经度来看地图。

5. 到 Google 做 Fusion Table 融合表。
Log in at <https://www.google.com/fusiontables/data?dsrclid=implicit>
(需要有 Google 账号)

https://www.google.com/fusiontables/data?dsrclid=implicit

Import new table

Column names are in row

1

1	label	lat	long
2	Harpasa	37.796623	28.362084
3	Apollonia Salbace	37.515110	29.039064
4	Ituci	37.448110	-6.363638
5	Urso	37.236984	-5.102780
6	Arcesine	36.800488	25.800018
7	Leptis Minor	35.671085	10.883524
8	Tarraco	41.115697	1.249594
9	Calagurris Julia	42.303705	-1.965033
10	Mothone	36.818010	21.707315
11	Barcino	41.387911	2.169911
12	Aphrodisias	36.157963	33.685873

Rows before the header row will be ignored.

New to Fusion Tables?

Take a peek! [Play with a data set](#) or [try a tutorial](#).

Cancel

« Back

Next »

希腊硬币生产

https://gist.github.com/ewg118/7eb155ed89f04219af0f http://nomisma.org/sparql
Edited at 12:19 AM

File Edit Tools Help Rows 1 Cards 1 Map of lat

Filter No filters applied

1-100 of 1270

label	lat	long
Harpasa	37.796623	28.362084
Apollonia Salbace	37.515110	29.039064
Ituci	37.448110	-6.363638
Urso	37.236984	-5.102780
Arcesine	36.800488	25.800018
Leptis Minor	35.671085	10.883524
Tarraco	41.115697	1.249594
Calagurris Julia	42.303705	-1.965033
Mothone	36.818010	21.707315
Barcino	41.387911	2.169911
Aphrodisias	36.157963	33.685873

数据类型一定要正确，如果是经纬度，就应该 是‘location’

Change column

Column name: lat

Description:

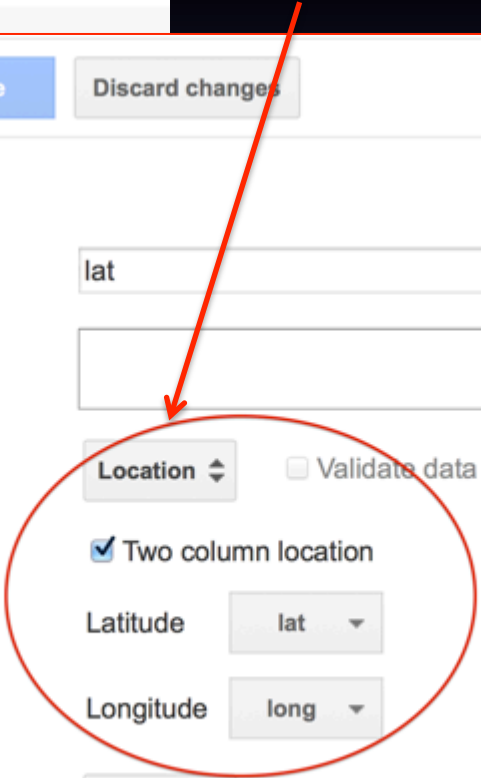
Type: Location Validate data [Learn more](#)

Two column location

Latitude: lat

Longitude: long

Format: None



希腊硬币生产

https://gist.github.com/ewg118/7eb155ed89f04219af0f http://nomisma.org/sparql
Edited at 12:19 AM

File Edit Tools Help

Rows 1

Cards 1

Map of lat

Rows 2



Filter No filters applied

1-100 of 1270

label	lat	long
Harpasa	37.796623	28.362084
Apollonia Salbace	37.515110	29.039064
Ituci	37.448110	-6.363638
Urso	37.236984	-5.102780
Arcesine	36.800488	25.800018
Leptis Minor	35.671085	10.883524
Tarraco	41.115697	1.249594
Calagurris Julia	42.303705	-1.965033
Mothone	36.818010	21.707315
Barcino	41.387911	2.169911
Aphrodisias	36.157963	33.685873

- Add row layout
- Add card layout
- Add summary
- Add chart
- Add map

希腊硬币生产

https://gist.github.com/ewg118/7eb155ed89f04219af0f http://nomisma.org/sparql
Edited at 12:19 AM

File Edit Tools Help

Rows 1

Cards 1

Map of lat

Rows 2

Map 2

Filter No filters applied

1,270 rows

Configure map

Location lat

Feature map

Change feature styles...

Change info window...

Heatmap

©2015 Google - 2000 km

第5步：数据再处理/可视化

- Ready to use
 - <http://en.dataviva.info/>
 - <http://en.lodlive.it/>
- Ready to build
 - <http://gaphi.org/>
 - <http://cytoscape.org/>
- Visual Programming Tools
 - R packages
 - D3.js

Other Visualization Examples

- <http://Xdata.kitware.com/ebola/>
- <http://language.media.mit.edu/visualizations/>
- Bottlenose: <http://bottlenose.com/>

Bottlenose



An ocean of data holds key information about the threats and opportunities affecting your business -- if only you could see it.

Bottlenose offers the first unified solution that provides flexible and secure

**BUSINESS INTELLIGENCE
FOR STREAM DATA**

We call it Stream Intelligence™

Tweet Data Visualization

Bottlenose – the world's first real-time visual analytics tool



回去后试试 RelFinder

<http://www.visualdataweb.org/>

Interactive
Relationship
Discovery in RDF
Data

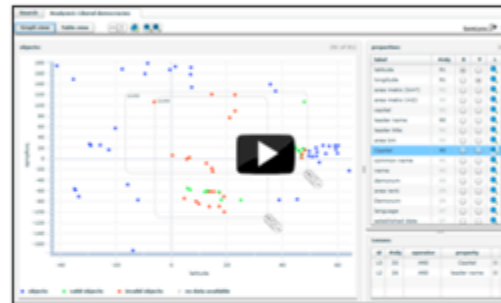


RelFinder

[Watch screencast](#)

[Try out live demo](#)

[Go to tool page](#)



SemLens

[Watch screencast](#)

[Try out live demo](#)

[Go to tool page](#)

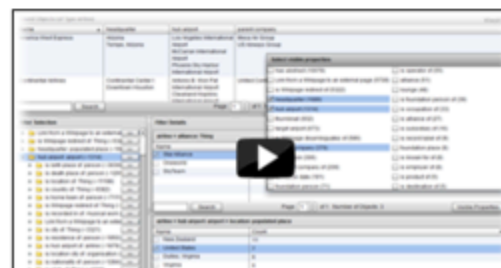


gFacet

[Watch screencast](#)

[Try out live demo](#)

[Go to tool page](#)



tFacet

[Watch screencast](#)

[Try out live demo](#)

[Go to tool page](#)

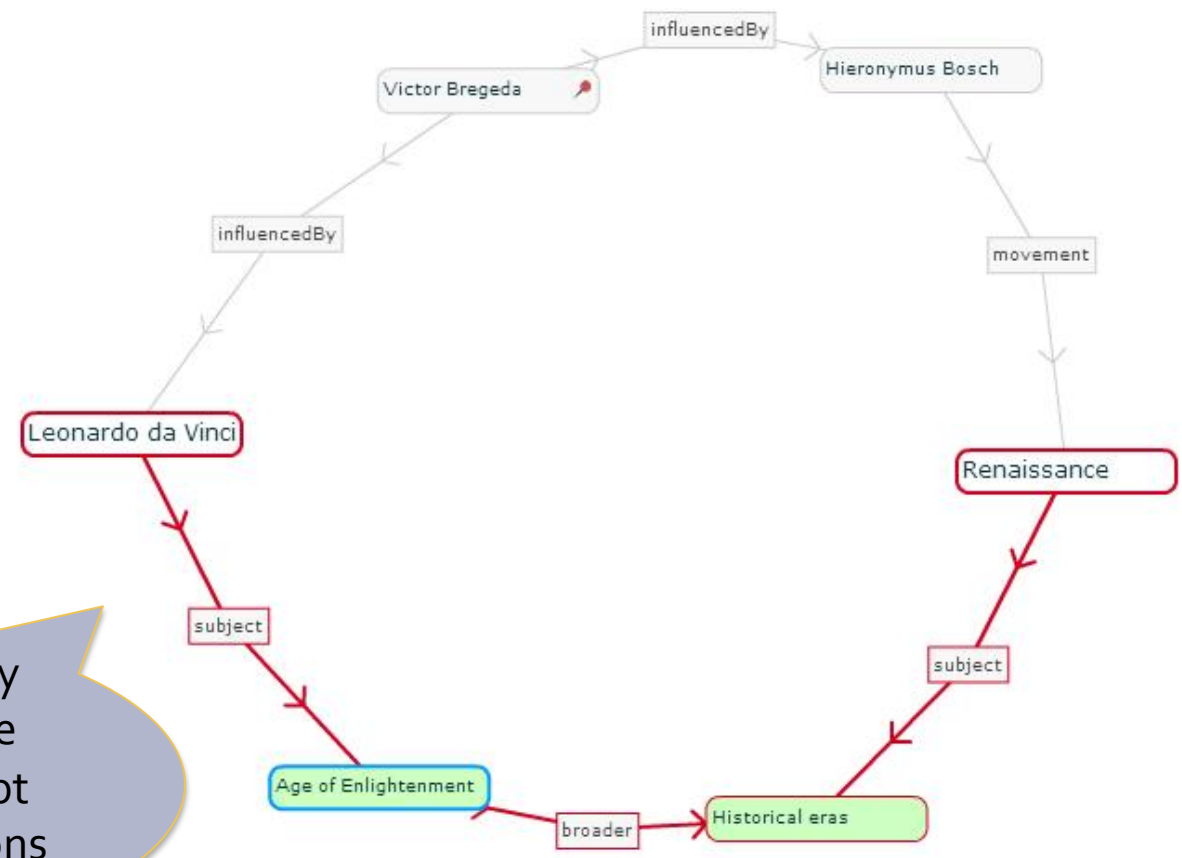
Example: Find relations between Leonardo da Vinci and Renaissance (based on DBpedia dataset) -1

1. Pointing to a SPARQL end point
2. Type two terms to find matching entries

The screenshot shows the RelFinder interface with the following elements:

- Search input fields containing "Leonardo da Vinci" and "Renaissance".
- Buttons for "add", "clear", and "Find Relations".
- A "Filter by:" section with checkboxes for "length", "class", "link", and "conne...".
- A table of results with columns "object class", "num", and "vi".
- Buttons for "Age of Enlightenm..." and "en".
- A link for "More Infos: dbpedia.org".

object class	num	vi
http://www.w3.org/2004/02/skos/core#Concept	2/2	
http://schema.org/Person	2/2	



3. The tool will display the triples one by one
4. Click on any concept to highlight the relations

Ready to build: Gaphi vs. Cytoscape

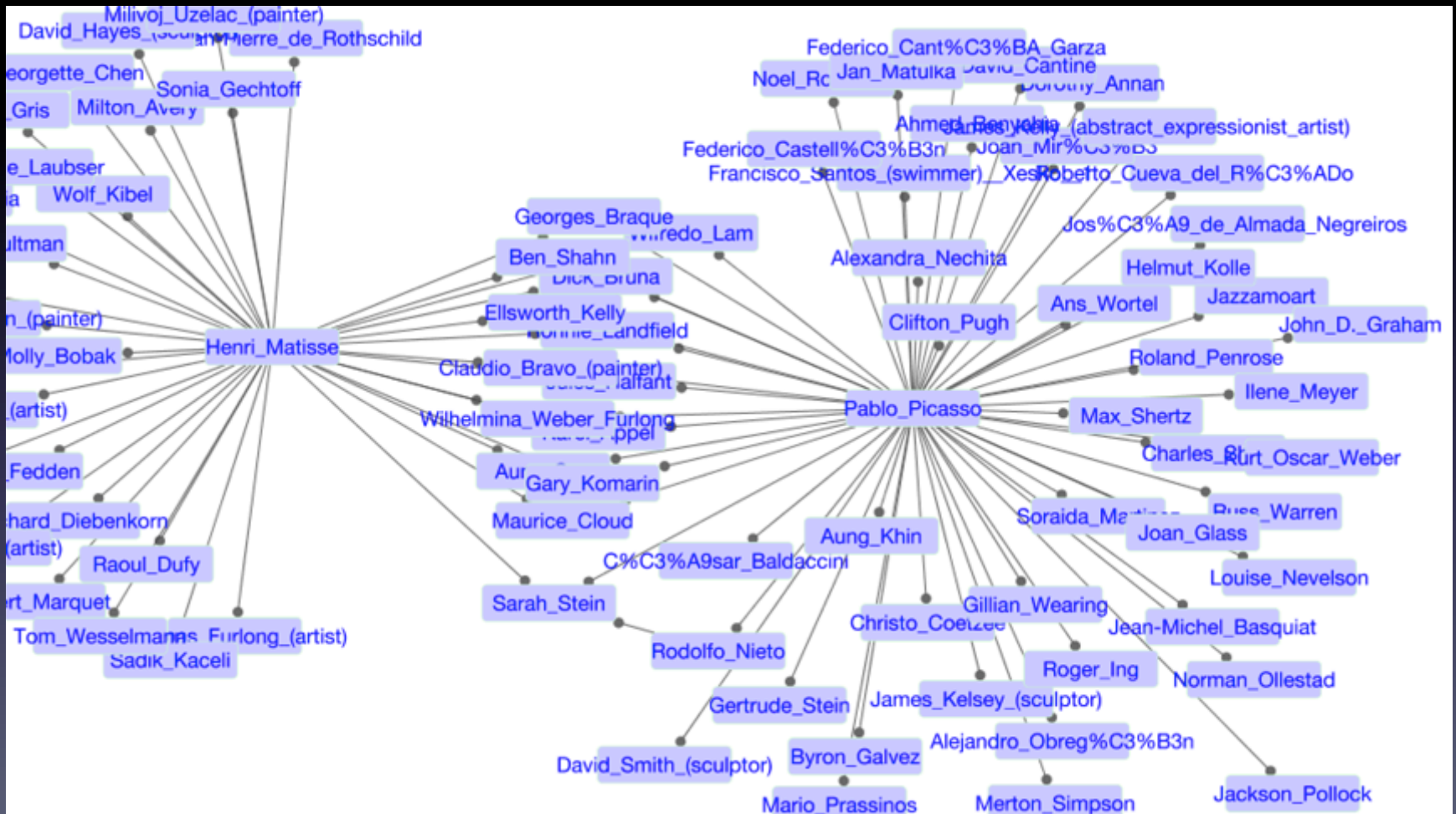
回去后试试:

- <http://gaphi.org/>
- <http://cytoscape.org/>

Cytoscape Quick Tutorial

- 4 种方式创立网络图
 - Importing pre-existing, fixed-format network files.
 - Importing pre-existing, unformatted text or Excel files.
 - Importing data from from public databases.
 - Creating an empty network and manually adding nodes and edges.
- 网络图的优化
 - Layout
 - Styles (colors, fonts, etc. for links and nodes)
 - Simplified (筛选)
 - 手工加减 nodes and links

Cytoscape Demo



更多工具,以后再试试: 1.RDFa

- 使你的网页内容产生格式化的语义标签,供搜索引擎使用
- W3C 标准。见rdfa.info

动手6: RDFa Play

步骤1. 将下列 HTML 网页的源码拷贝后，上 <http://rdfa.info/play/>，贴到网页的左边栏内，看看有什么出现。

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head> <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
<title>Metadata etc.</title> </head>
<body> <div prefix="http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
  <h1>Metadata etc.</h1>
  <ul>
  <li><a href="http://metadataetc.org/book-website2nd/"> &gt; textbook 2nd. ed. </a></li>
  <li><a href="http://metadataetc.org/book-website/">&gt; textbook 1st ed. </a></li>
  <li><a href="http://metadataetc.org/metadatabasics/"><em>&gt; Metadata Basics</em>
(tutorial) </a></li>
  </ul>
  <p>&copy; Marcia Lei Zeng 曾蕾 and Jian Qin 秦健</p> </div>
</body>
</html>
```

出来的结果应该是这样的：（下图：左边是你的源码，右边是HTML网页显示，下面啥也没有。）

The screenshot shows a web browser at the URL `rdfa.info/play/`. The page has a navigation bar with links for `RDFa`, `Play`, `Documentation`, `Tools`, and `Developers`. Below the navigation bar, there are tabs for `Examples:`, `Person`, `Social Network`, `Event`, `Place`, `Product`, and `SVG`. The main content area is split into two columns. The left column contains a code editor with the following HTML code:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional
<html xmlns="http://www.w3.org/1999/xhtml">
  <head> <meta http-equiv="Content-Type" content="text
    <title>Metadata etc.</title>
  </head>
  <body>
<div prefix="http://www.w3.org/1999/02/22-rdf-syntax-ns#
<h1>Metadata etc.</h1>
  <ul>
<li><a href="http://metadataetc.org/book-website2nd/"> &
<li><a href="http://metadataetc.org/book-website/">&gt;
<li><a href="http://metadataetc.org/metadatabasics/"><em
</ul>
<p>&copy; Marcia Lei Zeng 曾蕾and Jian Qin秦健</p>
</div>
  </body>
</html>
```

The right column shows the rendered HTML output, which is a simple page with the title `Metadata etc.` and a list of three links:

- [textbook 2nd. ed.](http://textbook2nd.ed)
- [textbook 1st ed.](http://textbook1st.ed)
- [Metadatabasics \(tutorial\)](http://Metadatabasics.tutorial)

Below the rendered output, the copyright notice `© Marcia Lei Zeng 曾蕾and Jian Qin秦健` is visible. At the bottom of the page, there are two tabs: `Visualization` and `Raw Data`.

步骤2. 现在再将下列 HTML 网页的源码拷贝后, 上 <http://rdfa.info/play/>

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head> <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
    <title>Metadata etc.</title>
  </head>
  <body>
<div prefix="http://www.w3.org/1999/02/22-rdf-syntax-ns# http://schema.org/" >
<div resource="http://metadataetc.org/" typeof="schema:WebPage">
<b1 property="schema:name">Metadata etc.</b1>
  <ul><li><div><a property="schema:URL" href="http://metadataetc.org/book-website2nd/">
<span property="schema:workExample">&gt; textbook 2nd. ed. </span></a></div></li>
<li><div><a property="schema:URL" href="http://metadataetc.org/book-website/">
<span property="schema:workExample">&gt; textbook 1st ed. </span></a></div></li>
<li><div><a property="schema:URL" href="http://metadataetc.org/metadatabasics/">
<span property="schema:workExample"><em>&gt; Metadata Basics</em> (tutorial) </span></a></div></li></ul>

<div id="supportingText"> <p>&copy; <span property="schema:creator" resource="http://viaf.org/viaf/120022309"
typeof="schema:Person"> <a property="schema:URL" href="http://marciazeng.slis.kent.edu/">
<span property="schema:name">Marcia Lei Zeng</span><span property="schema:name">曾蕾</span></a> </
span> and
  <span property="schema:creator" resource="http://viaf.org/viaf/68400494" typeof="schema:Person"> <a
property="schema:URL" href="http://ischool.syr.edu/People/jqin/">
<span property="schema:name">Jian Qin</span><span property="schema:name">秦健</span></a></span></p>
</div></div></div>
</body>
</html>
```

是否能看到 raw data 出来了? 然后再选 'visualization' 看图。

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/1999/xhtml">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head> <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>Metadata etc.</title>
  </head>
  <body>
    <div prefix="http://www.w3.org/1999/02/22-rdf-syntax-ns#" http://schema.org/ >
    <div resource="http://metadataetc.org/" typeof="schema:WebPage">
    <h1 property="schema:name">Metadata etc.</h1>
    <ul><li><div><a property="schema:URL" href="http://metadataetc.org/book-website2nd/">
    <li><div><a property="schema:URL" href="http://metadataetc.org/book-website1st/">
    <li><div><a property="schema:URL" href="http://metadataetc.org/metadatabasics/">
    <p>&copy;
      <span property="schema:creator" resource="http://viaf.org/viaf/120022309">
        <span property="schema:name">Marcia Lei Zeng</span><span property="schema:workExample" resource="http://viaf.org/viaf/68400494">
          <a property="schema:URL" href="http://ischool.syr.edu/People/jqin/">
            <span property="schema:name">Jian Qin</span><span property="schema:workExample" resource="http://viaf.org/viaf/68400494">
    </div></div></div>
  </body>
</html>
```

Metadata etc.

- > [textbook 2nd. ed.](#)
- > [textbook 1st ed.](#)
- > [Metadata Basics \(tutorial\)](#)

© [Marcia Lei Zeng](#) 曾蕾 and [Jian Qin](#) 秦健

Visualization

Raw Data

```
@prefix schema: <http://schema.org/> .

<http://metadataetc.org/>
  rdf:type schema:WebPage;
  schema:name "Metadata etc.";
  schema:URL <http://metadataetc.org/book-website2nd/>;
  schema:URL <http://metadataetc.org/book-website1st/>;
  schema:URL <http://metadataetc.org/metadatabasics/>;
  schema:workExample "> textbook 2nd. ed. ";
  schema:workExample "> textbook 1st ed. ";
  schema:workExample "> Metadata Basics (tutorial) ";
  schema:creator <http://viaf.org/viaf/120022309>;
  schema:creator <http://viaf.org/viaf/68400494> .

<http://viaf.org/viaf/120022309>
  rdf:type schema:Person;
  schema:URL <http://marciazeng.slis.kent.edu/>;
  schema:name "Marcia Lei Zeng";
  schema:name "曾蕾" .

<http://viaf.org/viaf/68400494>
  rdf:type schema:Person;
  schema:URL <http://ischool.syr.edu/People/jqin/>;
  schema:name "Jian Qin";
  schema:name "秦健" .
```

是否能看到 raw data 出来了? 然后再选 'visualization' 看图。

rdfa.info/play/

RDFa Play Documentation Tools Developers

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/1999/xhtml">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>Metadata etc.</title>
  </head>
  <body>
    <div prefix="http://www.w3.org/1999/02/22-rdf-syntax-ns#" http://schema.org/>
    <div resource="http://metadataetc.org/" typeof="schema:WebPage">
      <h1 property="schema:name">Metadata etc.</h1>
      <ul>
        <li><div><a property="schema:URL" href="http://metadataetc.org/book-website2nd/">book website 2nd ed.</a></div></li>
        <li><div><a property="schema:URL" href="http://metadataetc.org/book-website/">book website</a></div></li>
        <li><div><a property="schema:URL" href="http://metadataetc.org/metadatabasics/">metadata basics</a></div></li>
      </ul>
      <p>&copy;
        <span property="schema:creator" resource="http://viaf.org/viaf/120022309">
          <span property="schema:name">Marcia Lei Zeng</span><span property="schema:URL" href="http://marciazeng.slis.kent.edu/">
            <a property="schema:URL" href="http://viaf/68400494">
              <a property="schema:URL" href="http://ischool.syr.edu/People/jqin/">
                <span property="schema:name">Jian Qin</span><span property="schema:URL" href="http://ischool.syr.edu/People/jqin/">
              </a>
            </a>
          </span>
        </span>
      </p>
    </div></div></div>
  </body>
</html>
```

Metadata etc.

- > [textbook 2nd. ed.](#)
- > [textbook 1st ed.](#)
- > [Metadata Basics \(tutorial\)](#)

© [Marcia Lei Zeng](#) 曾蕾 and [Jian Qin](#) 秦健

Visualization Raw Data

```
graph LR
  WP((Web Page http://metadataetc.org/)) --- T1((type: WebPage))
  WP --- N1((name: Metadata etc.))
  WP --- U1((URL: http://metadataetc.org/book-website2nd/))
  WP --- U2((URL: http://metadataetc.org/book-website/))
  WP --- U3((URL: http://metadataetc.org/metadatabasics/))
  WP --- WE1((workExample: > textbook 2nd. ed.))
  WP --- WE2((workExample: > textbook 1st ed.))
  WP --- WE3((workExample: > Metadata Basics (tutorial)))
  WE1 --- C1((creator: 120022309))
  WE2 --- C1
  WE3 --- C1
  WE1 --- C2((creator: 68400494))
  WE2 --- C2
  WE3 --- C2
  C1 --- T2((type: Person))
  C1 --- U4((URL: http://marciazeng.slis.kent.edu/))
  C1 --- N2((name: Marcia Lei Zeng))
  C1 --- N3((name: 曾蕾))
  C2 --- T3((type: Person))
  C2 --- U5((URL: http://ischool.syr.edu/People/jqin/))
  C2 --- N4((name: 秦健))
```

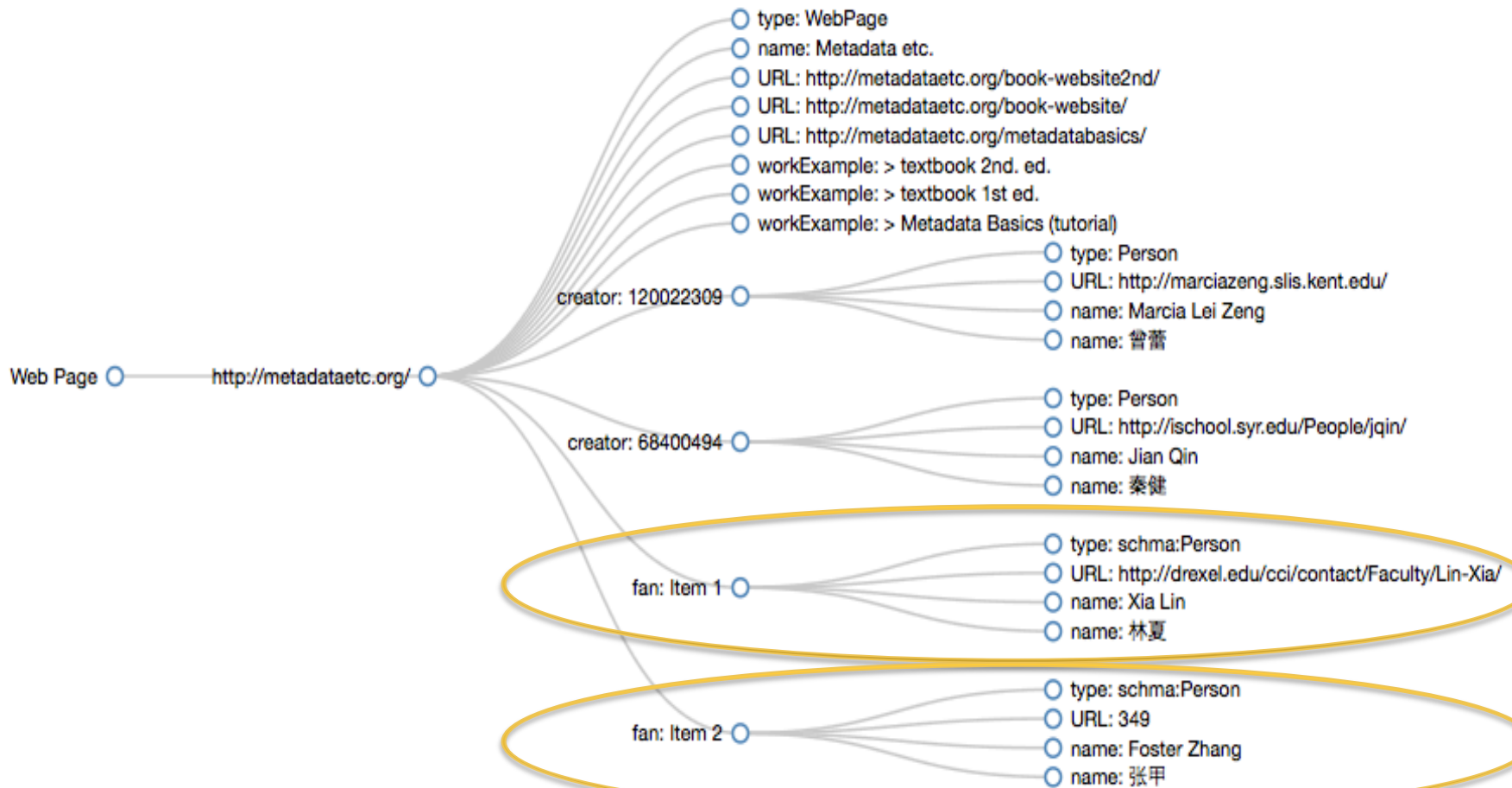

步骤3. 再比较一下，原来源码中加了几个语义描述特征词，请找出：
prefix,
property,
resource,
typeof 字样。

还有，关于两位作者是怎么描述的？

RDF 注释 (RDFa) 涉及到标记一个网站中的结构化数据。作为一个在 Web 上以内联方式注释 HTML 文档的系统取得了巨大成功。谷歌和其他搜索引擎都以 Rich Snippets 的形式为它提供支持。一个大大简化的版本RDFa 1.1仅向 HTML 或 XHTML增加了5个属性。机器可轻松地解释这些属性，以从页面中提取有用的数据。（建议看<http://www.ibm.com/developerworks/cn/web/wa-rdfalite/>。）

步骤4.加上你的名字

- 你是曾蕾老师的粉丝吗? — Show it!



更多工具,以后再试试: 本体的可视化显示

将你的本体写成OWL格式

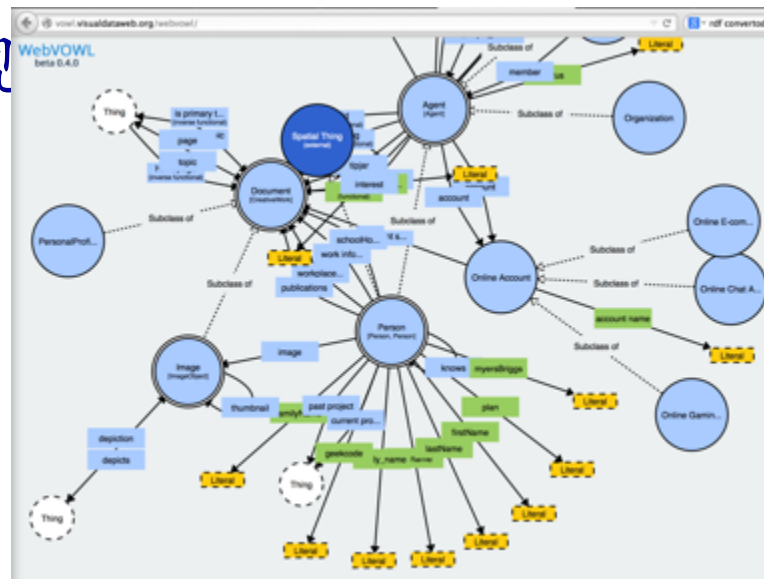
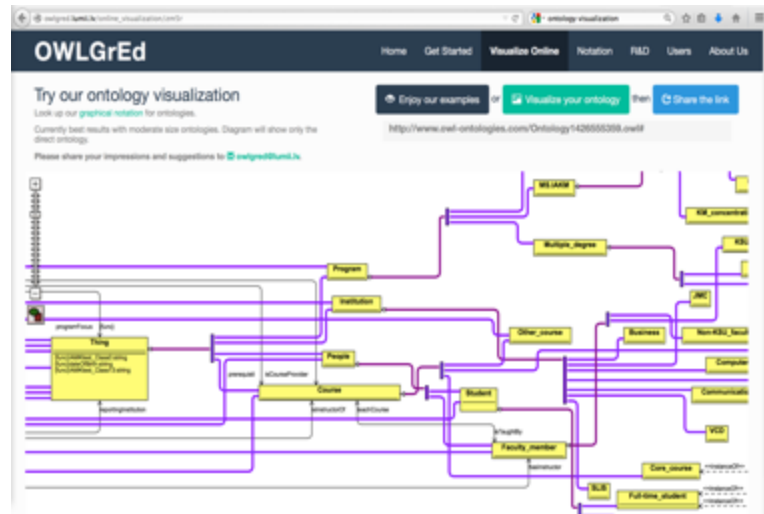
方法1. 从你的laptop上传, 到

[http://owlgred.lumii.lv/
online_visualization](http://owlgred.lumii.lv/online_visualization)

方法2. 将已经放到网上的文件可视化

[http://vowl.visualdataweb.org/
webvowl/#iri=](http://vowl.visualdataweb.org/webvowl/#iri=)

[你的本体的IRI]



<http://vowl.visualdataweb.org/webvowl/>

Summary

- Congratulations! You are on your way to become a Linked Data Librarian!
- Keep practice, Work on real projects!
- Service, Service, Service!