



DH 2023

Collaboration
as Opportunity

SPARQL for (digital) Humanists – Querying Wikidata and the MiMoTextBase



Rheinland-Pfalz

MINISTERIUM FÜR
WISSENSCHAFT, WEITERBILDUNG
UND KULTUR



UNIVERSITÄT
TRIER



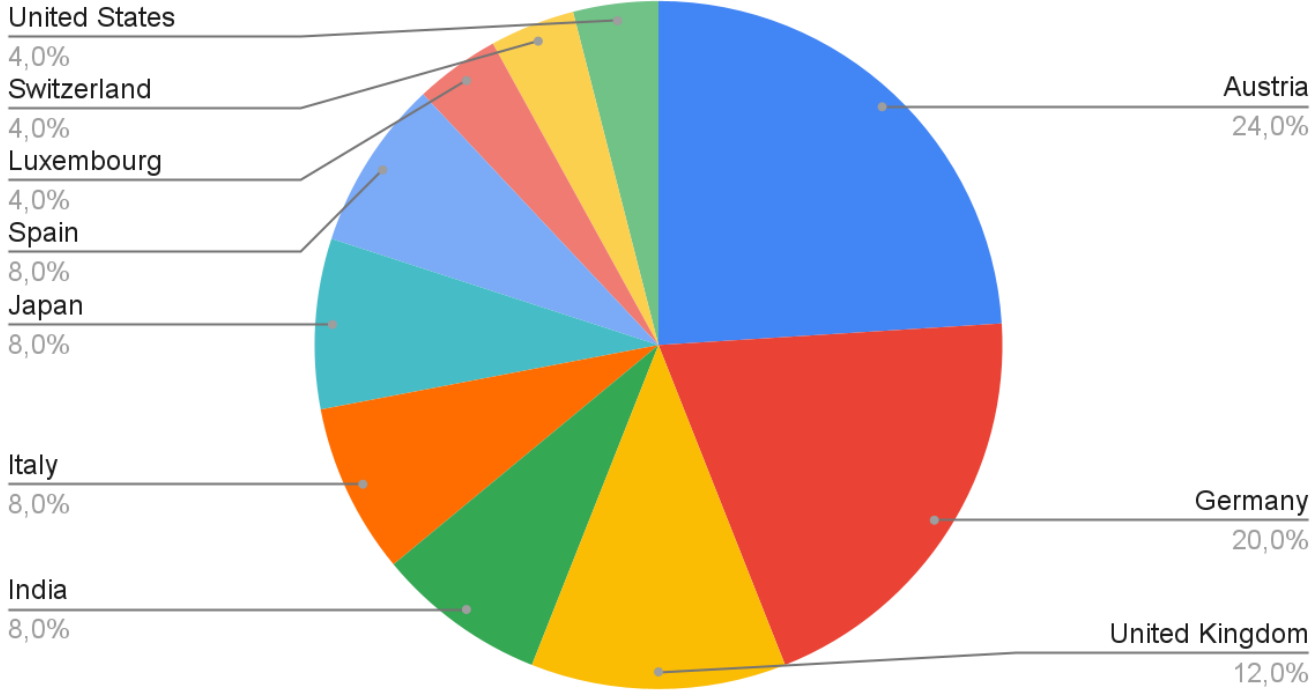
Kompetenzzentrum
Trier Center for Digital Humanities



MiMoText
Mining and Modeling Text

Workshop Diversity

Country Distribution



A word cloud of academic and digital humanities terms. The words are arranged in a roughly rectangular shape, with varying font sizes and colors ranging from light to dark green. The most prominent words are 'Digital Scholarly Editions', 'Social Network Analysis', 'literary texts', 'filmographic metadata', 'cultural heritage', 'historical dictionaries', 'STS', 'feminist film history', 'gender', 'sustainability', 'archaeology', 'history', 'topics', 'linked metadata for writers/recipients', 'Network analysis of epistolary networks', 'narration', 'Colonial Latin American book history', 'usability', 'visualization', 'linked open', and 'open reserach data'.

gender sustainability archaeology
feminist film history
Historical Dictionaries STS
Digital Scholarly Editions
topics linked metadata for writers/recipients
Network analysis of epistolary networks history
narration Colonial Latin American book history
Social Network Analysis
filmographic metadata
usability cultural heritage
visualization linked open
open reserach data literary texts

Structure and Goals of the Workshop

- Introduction
- Part 1: MiMoTextBase
(55min)



(break)

- Part 2: Wikidata
(55min)



(break)

- Part 3: Federated Queries
(55min)



(break)

- Outlook and Discussion

Per part:
input, practice &
plenary: adaptation
and formulation of
own SPARQL
queries, results in
plenary

 shared
document for
queries etc.
Links

Introduction:

Semantic Web Basics & LOD and RDF & SPARQL

Overview Introduction

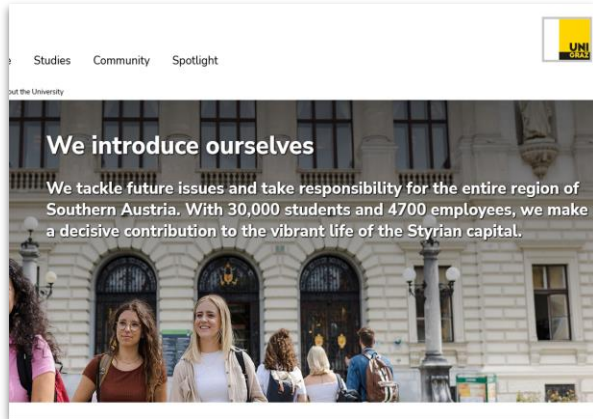
- Introduction

- Basics Semantic Web & Linked Open Data and RDF & SPARQL
 - Basics of 'Linked Open Data'
 - What is a Knowledge Graph?
 - SPARQL & RDF within the Semantic Web Technology Stack
- MiMoText & MiMoTextBase
 - Project overview
 - Data model & infrastructure
- Organization

Introduction: Semantic Web Basics & LOD and RDF & SPARQL

What is Linked Open Data (LOD)?

- **Data:** information represented in machine-readable form
- **Linked:** different data sets linked by shared identifiers
- **Open:** available online, open formats, open licence



The image shows a screenshot of the Wikidata page for the University of Graz. The page title is 'University of Graz (Q622683)'. Below the title, there is a table with columns for 'Language', 'Label', 'Description', and 'Also known as'. The table lists the university's name in various languages, including English, German, French, and Bavarian. A red box highlights the 'instance of' property, which is set to 'university'. Another red box highlights the 'Wikipedia' property, which is set to 'university (en)'. Red arrows point from the labels 'subject', 'predicate', and 'object' to these respective elements.


Language	Label	Description	Also known as
English	University of Graz	university in Graz, Austria	Carlo Francesco Gracensis Karl-Franzens-Universität uni-graz.at
German	Universität Graz	Universität in Österreich	Karl-Franzensuniversität Karl-Franzens-Universität Graz Karl-Franzens-Universität KFU Graz KfU Uni Graz Karl-Franzens-Universität Graz Karl-Franzens-Universität Universität Graz
French	université de Graz	université autrichienne se trouvant à Graz	Université de Graz Karl-Franzens-Universität
Bavarian	No label defined	No description defined	

Introduction: Semantic Web Basics & LOD and RDF & SPARQL

What is a Knowledge Graph?

Introduction: Semantic Web Basics & LOD and RDF & SPARQL

Search English pages ▾ Any time ▾ All results ▾ Clear


 **Wikipedia**
<https://en.wikipedia.org/wiki/Graz>






Graz - Wikipedia


Graz is the capital city of the Austrian state of Styria and second-largest city in Austria after Vienna. As of 1 January 2021, it had a population of ...

Area code: +43 316 State: Styria


Schlossberg (Graz) · Kainbach bei Graz · Hart bei Graz · Feldkirchen bei Graz

 **Images for graz**



[View all](#) → [Feedback](#)


 **Graz tourism**
<https://www.graztourismus.at>

Graz tourism: Graz Austria | Holiday offers, information & sights

Website of the **Graz Tourism Board**: Discover accommodation, sights & highlights of the city. Inform yourself about the Styrian capital & book your holidays!

Graz

City in Austria



Graz is the capital city of the southern Austrian province of Styria. At its heart is Hauptplatz, the medieval old town's main square. Shops and restaurants line the narrow surrounding streets, which blend Renaissance and baroque architecture. A funicular leads up Schlossberg, the town hill, to the Uharturm, a centuries-old clock tower. Across the River Mur, futuristic Kunsthaus Graz exhibits contemporary art. — Google

Population: 283,869 (2017) [United Nations](#)

Weather: 12°C, Wind NE at 10 km/h, 71 % Humidity [More on weather.com](#)

Local time: Thursday 08:54

Postal code: A-801x, A-802x, A-803x, A-804x, A-805x

Mayor: Elke Kahr

Elevation: 353 m (1,158 ft)

District: Statutory city

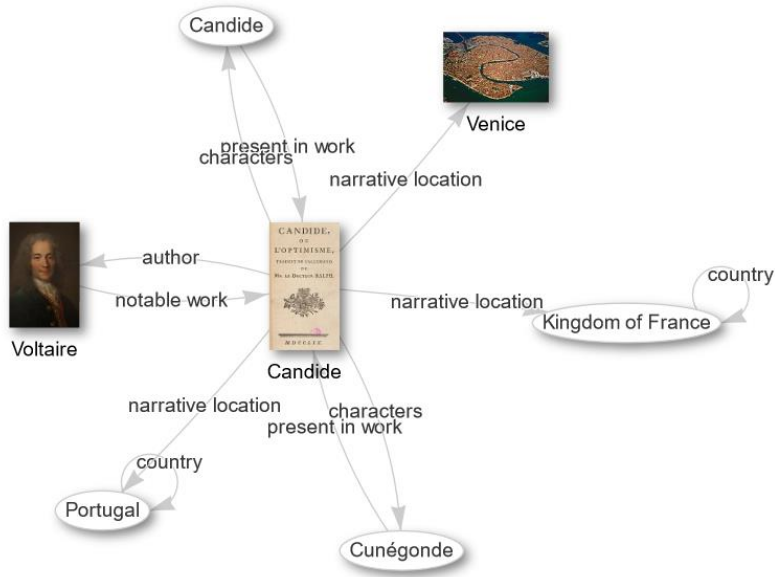
Language ▾

Density ▾

“Things, Not Strings.”
(Amit 2012)

(example of the
Google Knowledge
Graph)

Introduction: Semantic Web Basics & LOD and RDF & SPARQL



“We define a Knowledge Graph as an RDF graph. An RDF graph consists of a set of RDF triples [...].”

(Färber et al. 2016)

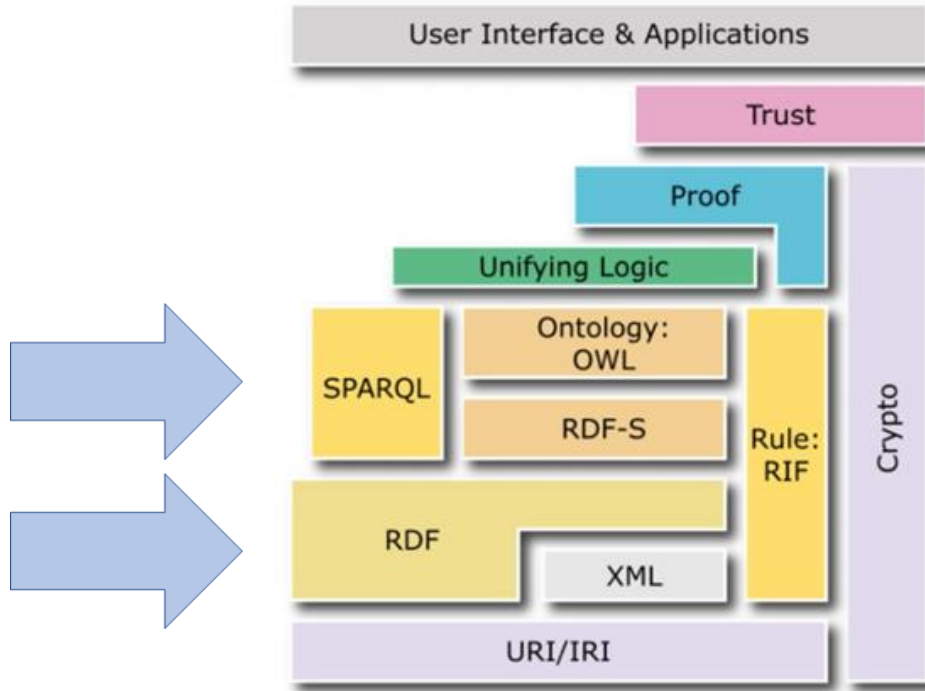
“Knowledge graphs are large networks of entities, their semantic types, properties, and relationships between entities.”

(Krötzsch 2016)

What is a Knowledge Graph?

Query: [https://w.wiki/6\\$Jg](https://w.wiki/6$Jg)

Introduction: Semantic Web Basics & LOD and RDF & SPARQL



- Resource Description Framework / RDF:
 - W3C-Standard
 - basic format of the Semantic Web
 - Data storage in triples in the structure 'subject-predicate-object'.

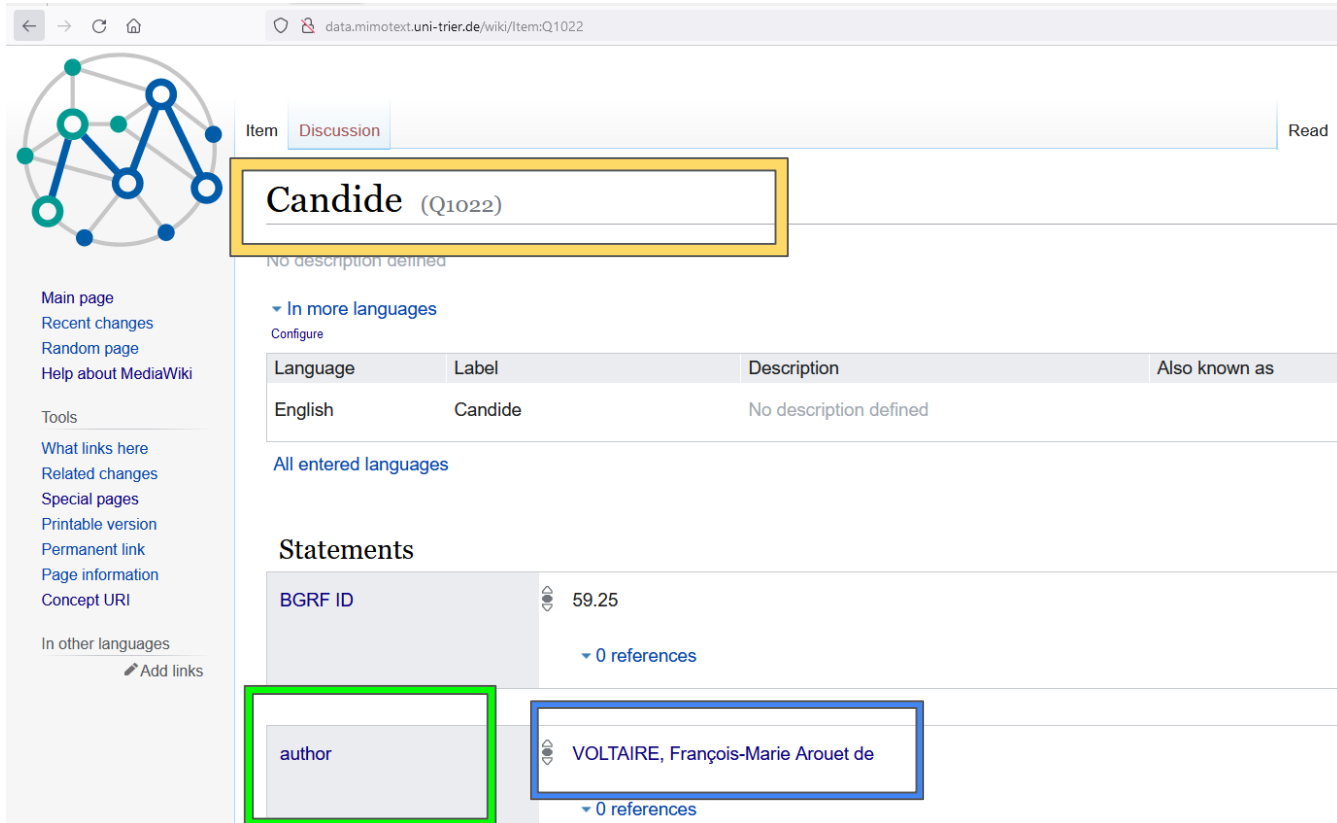
- SPARQL Protocol and RDF Query Language / SPARQL
 - W3C-Standard
 - graph-based query language for RDF

SPARQL in the Semantic Web Technology Stack

Introduction:

MiMoText & MiMoTextBase

Introduction: MiMoText & MiMoTextBase – Data model and infrastructure



The screenshot shows a MediaWiki page for the item 'Candide (Q1022)'. The page title 'Candide (Q1022)' is highlighted with a yellow box. Below the title, there is a table of 'In more languages' with columns for Language, Label, Description, and Also known as. The table shows 'English' with the label 'Candide' and 'No description defined'. Below the table, there is a 'Statements' section. The first statement is 'BGRF ID' with the value '59.25'. The second statement is 'author' with the value 'VOLTAIRE, François-Marie Arouet de'. The 'author' label and its corresponding value are highlighted with a green box, and the value 'VOLTAIRE, François-Marie Arouet de' is highlighted with a blue box.

Item [Discussion](#) [Read](#)

Candide (Q1022)

No description defined


[In more languages](#)


Configure

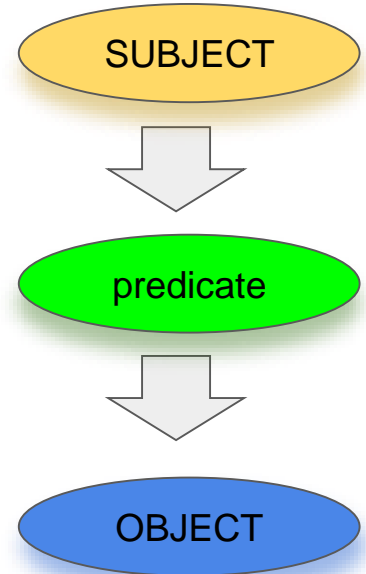
Language	Label	Description	Also known as
English	Candide	No description defined	

[All entered languages](#)

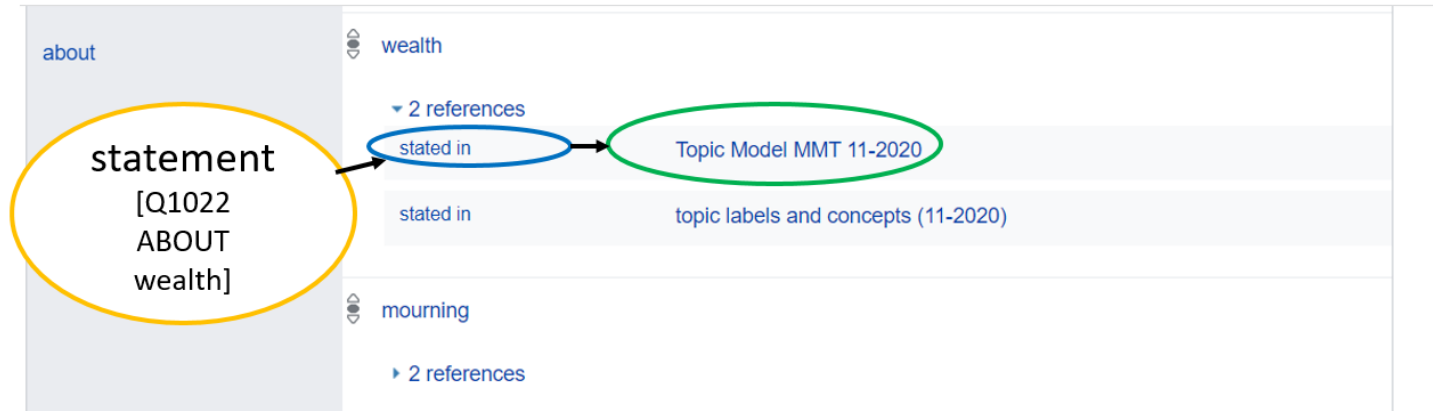
Statements

BGRF ID  59.25 [0 references](#)

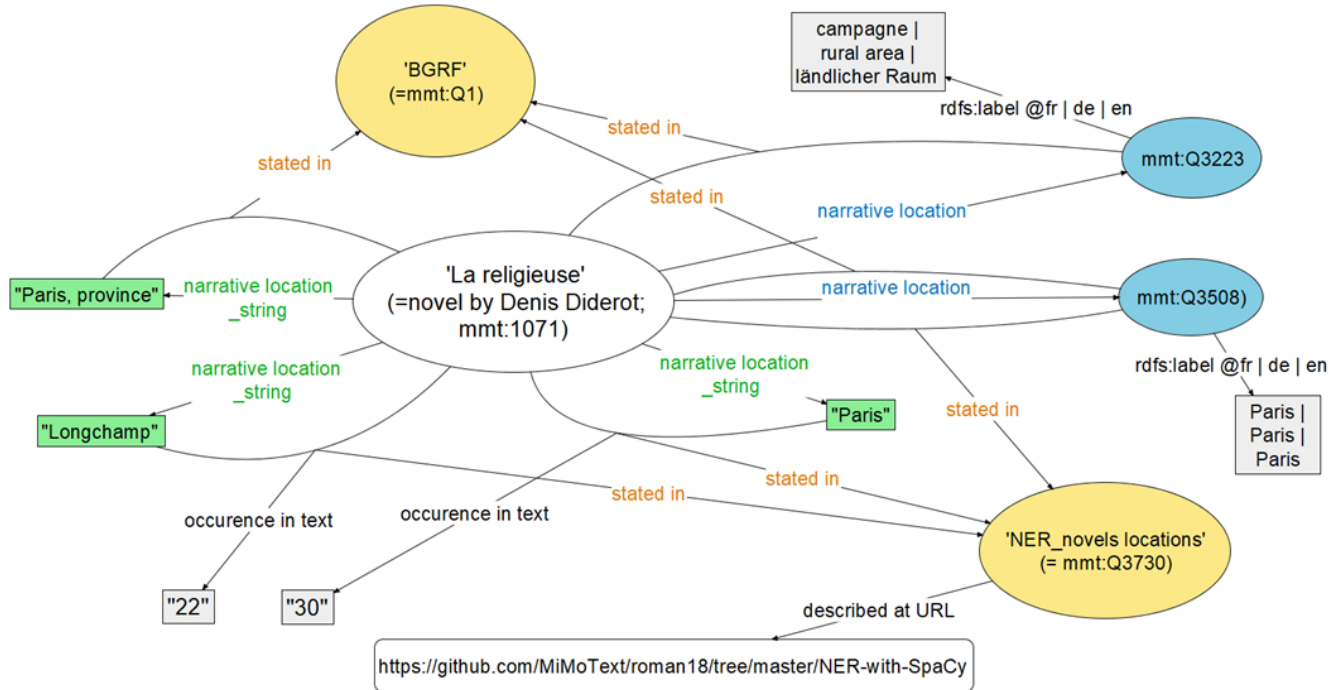
author  VOLTAIRE, François-Marie Arouet de [0 references](#)



Introduction: MiMoText & MiMoTextBase – Data model and infrastructure

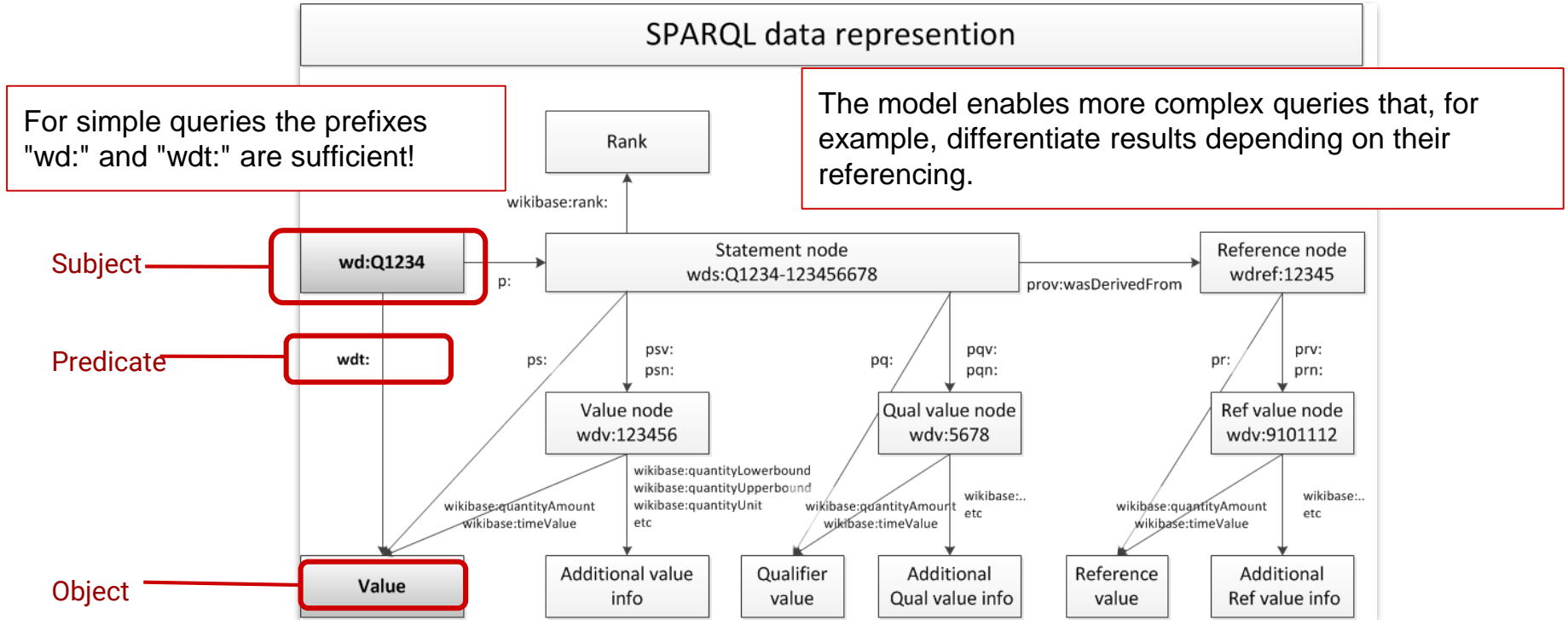


Introduction: MiMoText & MiMoTextBase – Data model and infrastructure



“things & strings”: statements about narrative locations of *La religieuse*

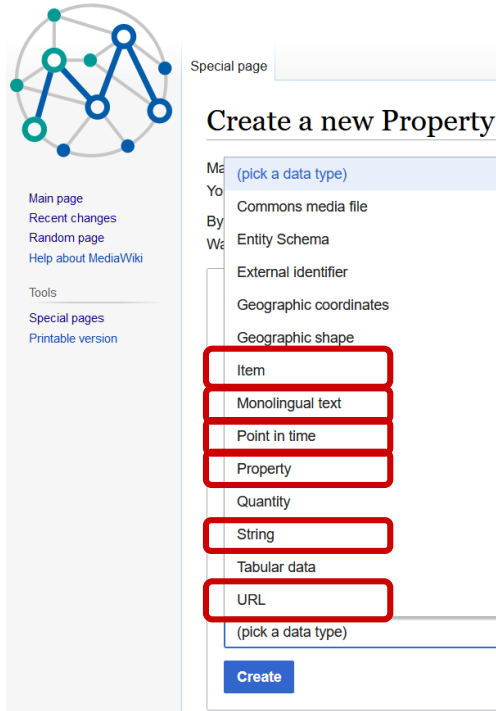
Introduction: MiMoText & MiMoTextBase – Data model and infrastructure



Quelle: UserHenkvD: [SPARQL data representation, as used by Wikidata Query Service](#). 2017. CC BY-SA 4.0

“under the hood”: Wikibase-Datenmodell

Introduction: MiMoText & MiMoTextBase – Data model and infrastructure



Special page

Create a new Property

Me

Yo Commons media file

By Entity Schema

We External identifier

Geographic coordinates

Geographic shape

Item

Monolingual text

Point in time

Property

Quantity

String

Tabular data

URL

Main page
Recent changes
Random page
Help about MediaWiki

Tools
Special pages
Printable version

Property data types in a Wikibase instance (all) and in the MiMoTextBase (red)

Introduction: MiMoText & MiMoTextBase – Data model and infrastructure

<http://data.mimotext.uni-trier.de/wiki/Item:Q3126>

travel (Q3126) ← 1 Identifier

No description defined



▼ In more languages
Configure

Language	Label	Description	Also known as
English	travel	No description defined	
de	Reise	No description defined	
fr	voyage	No description defined	

← 3 Label

[Fewer languages](#)

Statements

exact match	 https://www.wikidata.org/entity/Q61509 ▶ 1 reference
instance of	 thematic concept ▶ 1 reference

rdfs:label@en
rdfs:label@de
rdfs:label@fr

Controlled
vocabularies in
MiMoText:

<https://github.com/mimotext/vocabularies>

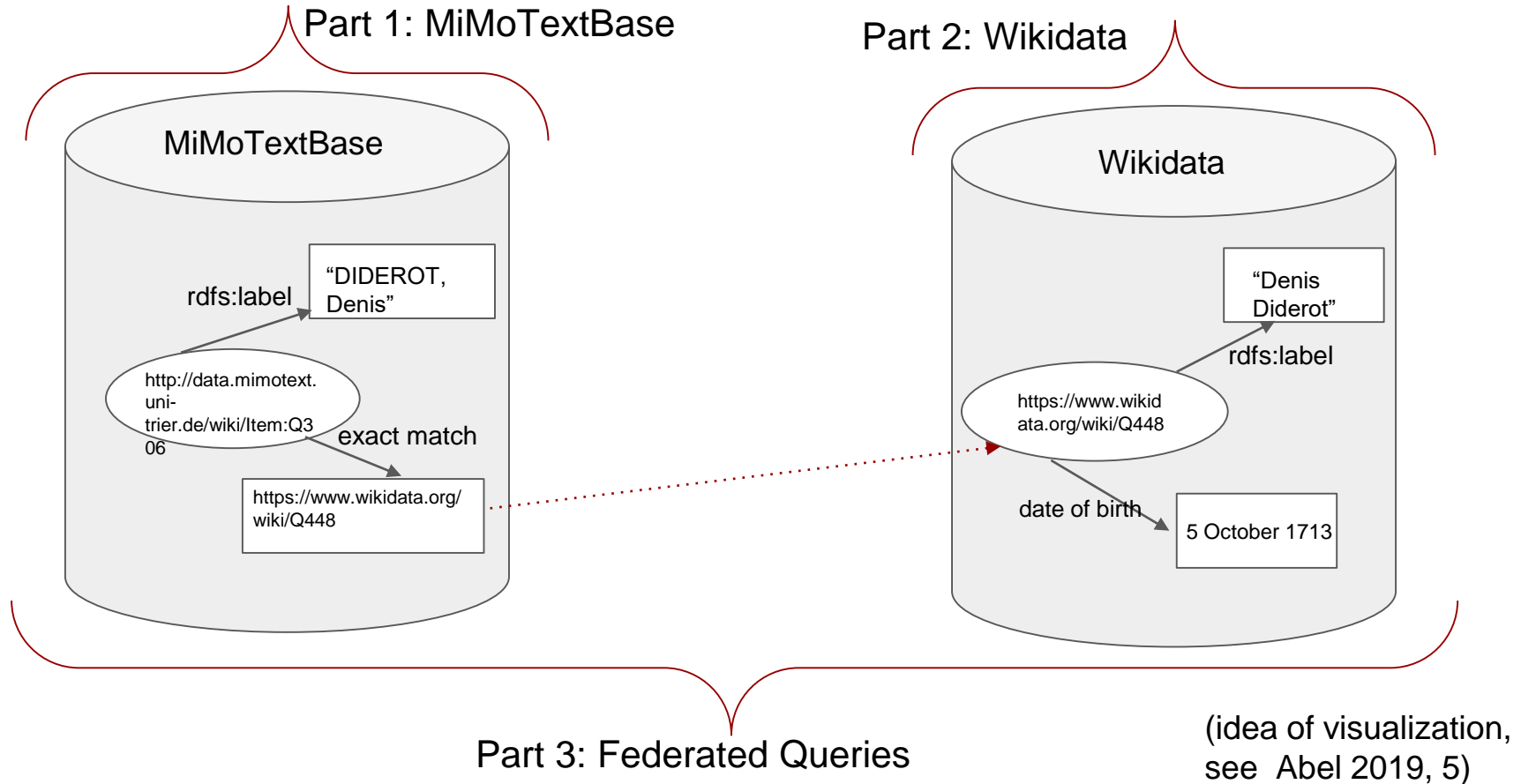
Introduction: MiMoText & MiMoTextBase – Data model and infrastructure

- Module 1: theme
- Module 2: space
- Module 3: narrative form
- Module 4: literary work
- Module 5: author
- Module 6: mapping
- Module 7: referencing
- Module 8: versioning & publication
- Module 9: terminology
- Module 10: bibliography
- Module 11: scholarly work

Modules of the MiMoText-ontology

<https://github.com/MiMoText/ontology>

Introduction: MiMoText & MiMoTextBase – Data model and infrastructure



Introduction: Organization

Structure & Schedule

- 1:30 pm: Welcome and introduction
- 1:55 pm: Part 1: MiMoTextBase
- [break]
- 3:00 pm: Part 2: Wikidata
- [break]
- 4:10 pm: Part 3: federated queries
- [break]
- 5:05 pm: outlook & discussion
- 5:30 pm: end

- 6:00 pm: Dinner

Shared Document

- ... for & and by all participants (cf. mail)
- Workshop Queries on Gallery (MiMoTextBase–tutorial, Gallery)



Part 1: SPARQL-Basics & MiMoTextBase

1.1. Between Questions, Triples und Queries

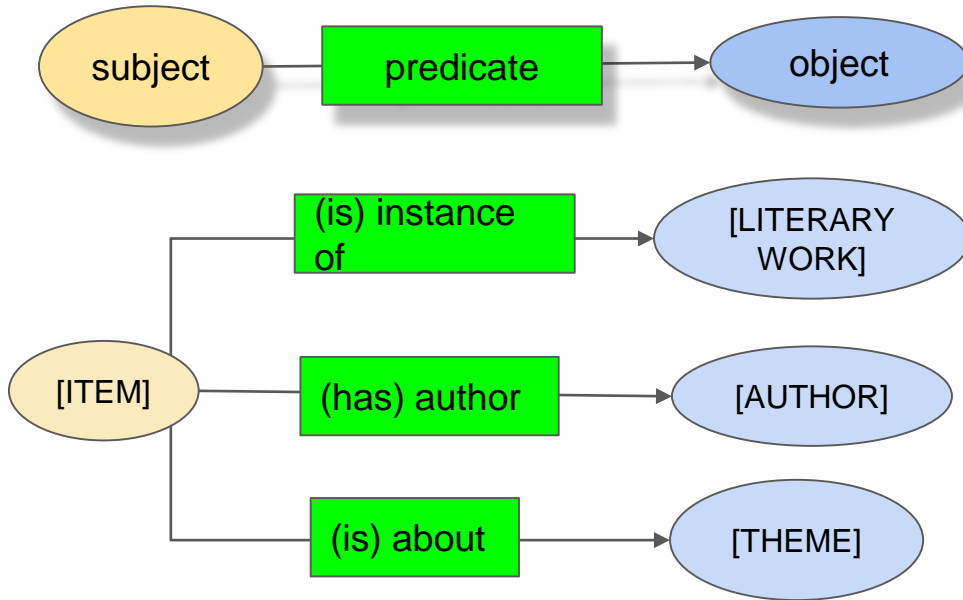
- Which of Rousseau's novels are about 'education'?
- What themes appear in the French Enlightenment novel?

1.1. Between Questions, Triples und Queries

Which of **Rousseau's novels**, **are about 'education'**?



Which **literary works**, **written by Rousseau**, **are about 'education'**?

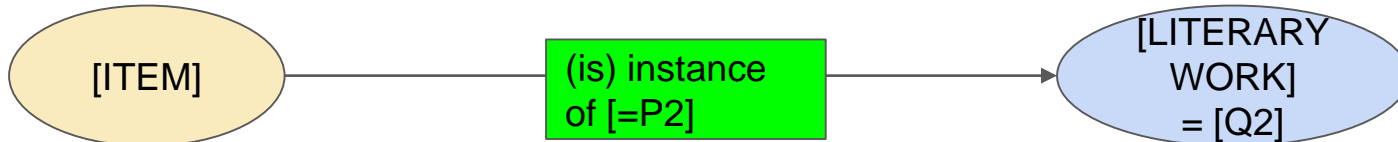


Émile (Q1027)

- instance of literary work
- author ROUSSEAU, Jean-Jacques
- about education
- ▶ 4 references

1.1. Between Questions, Triples und Queries

Which **literary works**, **written by Rousseau**, **are about 'education'**?



Which literary works are in the MiMoTextBase?



?item

- **variable** that we ask for;
- starts with a **?**



wdt:P2

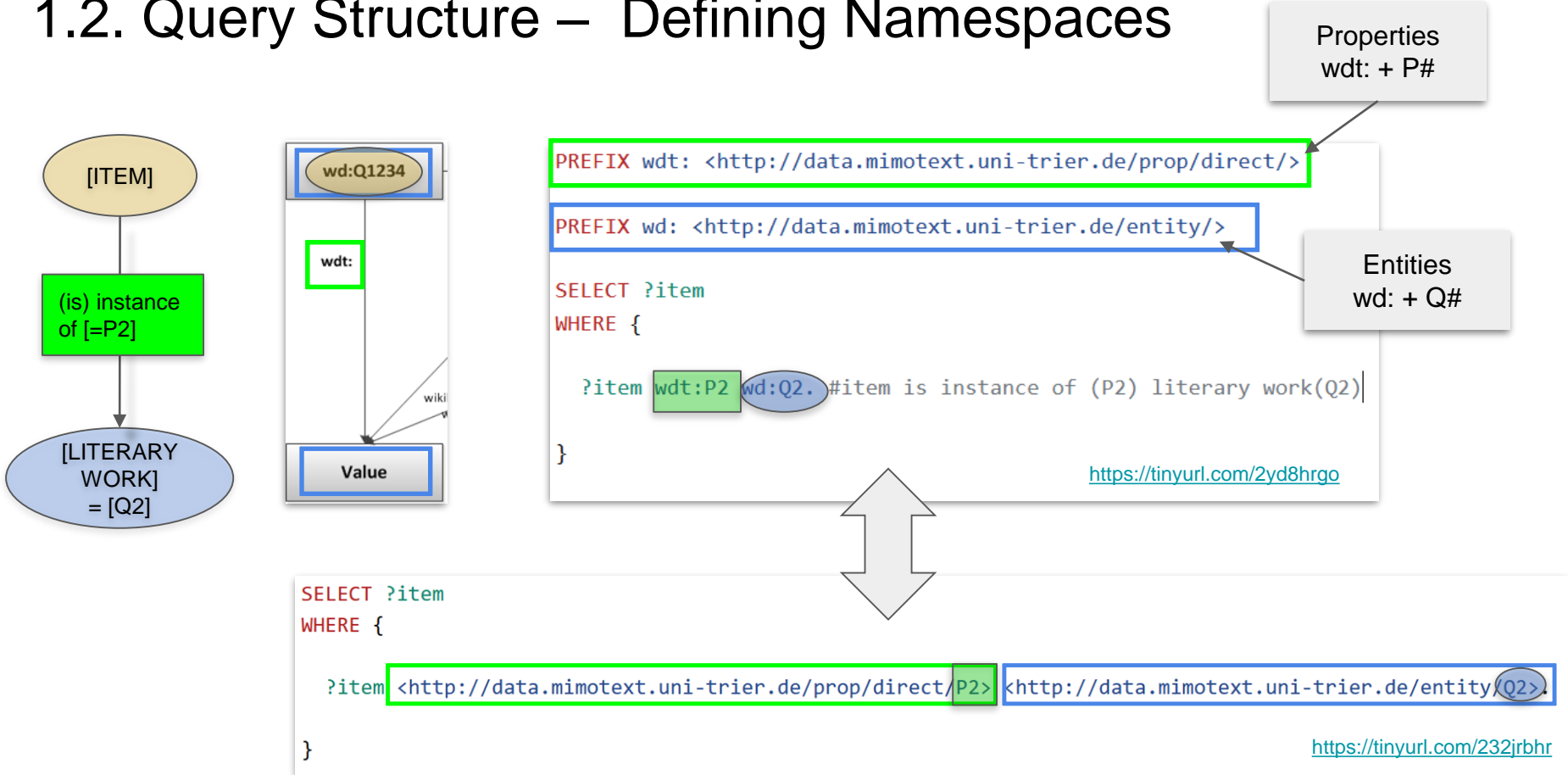
- predicate defined by namespace **prefix wdt:**
- starts with **P + corresponding number**



wd:Q2

- object defined by namespace **prefix wd:**
- starts with **Q + corresponding number**

1.2. Query Structure – Defining Namespaces



1.2. Query Structure

```
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>  
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
```

```
SELECT ?item
```

```
WHERE {  
  
  ?item wdt:P2 wd:Q2. #item is instance of (P2) literary work(Q2)|  
  
}
```



defining the
Prefixes for the
Namespaces

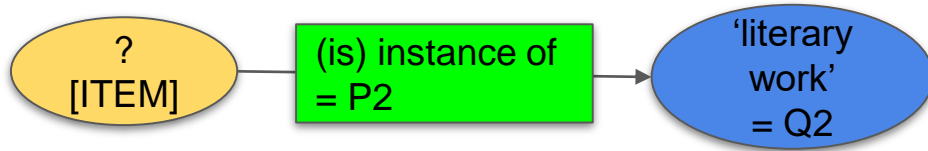


selecting variables
shown in result



specifying result by
triple patterns

1.2. Query Structure



```
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>
```

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
```

```
SELECT ?item
```

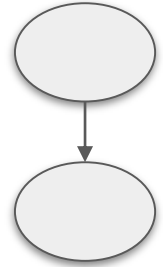
```
WHERE {
```

```
?item wdt:P2 wd:Q2. #item is instance of (P2) literary work(Q2)
```

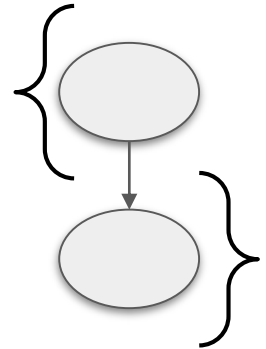
```
}
```

<https://tinyurl.com/2yd8hrqo>

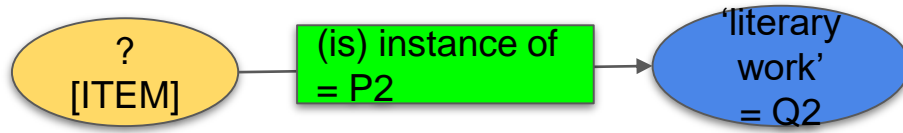
R
D
F



S
P
A
R
Q
L



1.2. Query-Structure: one *tripel pattern*



Which literary works are in the MiMoTextBase?

```
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>
```

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
```

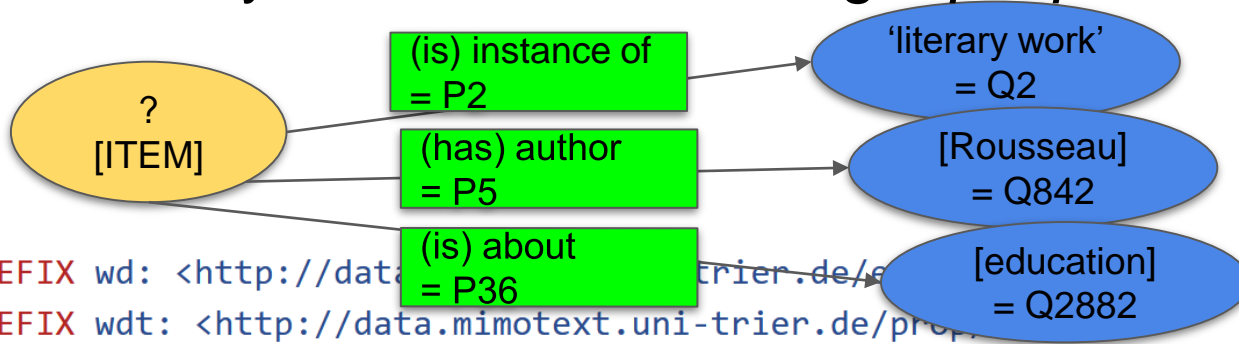
```
SELECT ?item
```

```
WHERE {
```

```
?item wdt:P2 wd:Q2. #item is instance of (P2) literary work(Q2)
```

```
}
```

1.2. Query Structure: combining *tripel patterns*



```
PREFIX wd: <http://data.mimotext.uni-trier.de/prop/ontology/ontology.ttl#>  
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/ontology/ontology.ttl#>
```

```
SELECT ?item  
WHERE{
```

```
?item wdt:P2 wd:Q2. # item is instance of literary work.
```

Which of Rousseau's novels are about 'education'?

```
}
```

1.2. Query Structure: combining *triple patterns*

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
```

```
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>
```

```
SELECT ?item
```

```
WHERE{
```

```
  ?item wdt:P2 wd:Q2. # item work.
```

```
  ?item wdt:P5 wd:Q842. # item Jacques Rousseau (Q842)
```

```
  ?item wdt:P36 wd:Q2882. # item tion (Q2882).
```

```
}
```

SYNTAX-VERSION I:

All elements of a triple are named and all triples end with a period.

1.2. Query Structure: combining *tripel patterns*

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
```

```
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>
```

```
SELECT ?item
```

```
WHERE{
```

```
  ?item wdt:P2 wd:Q2; # item
```

```
  wd:P5 wd:Q842; # ite
```

```
  wd:P36 wd:Q2882. # it
```

```
  }
```

SYNTAX-VERSION II:

All but the last triple end with a semicolon. The subject (?item) is not repeated. The last triple ends with a period.

Works only if it concerns the same subject.

rousseau (Q842)

2).

1.2. Query Structure: combining *tripel patterns*

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>

SELECT ?item
WHERE{

    ?item wdt:P2 wd:Q2; # item is instance of literary work.

    wdt:P5 wd:Q842; # item has author (P5) Jean-Jacques Rousseau (Q842)

    wdt:P36 wd:Q2882. # item is about (P36) education (Q2882).
}
```

Which of Rousseau's novels are about 'education'?

item

2 results in 67 ms

[Q <http://data.mimotext.uni-trier.de/entity/Q1027>](http://data.mimotext.uni-trier.de/entity/Q1027)

[Q <http://data.mimotext.uni-trier.de/entity/Q1429>](http://data.mimotext.uni-trier.de/entity/Q1429)

2 Items

1.3. Operations and functions: LABEL

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>

SELECT ?item ?itemLabel
WHERE {
  ?item wdt:P2 wd:Q2; # item is instance of literary work.
        wdt:P5 wd:Q842; # item has author (P5) Jean-Jacques Rousseau (Q842)
        wdt:P36 wd:Q2882. # item is about (P36) education (Q2882).
  ?item rdfs:label ?itemLabel.
}
```

item	itemLabel
Q <http://data.mimotext.uni-trier.de/entity/Q1429>	Lettres de deux amans, habitans d'une petite ville au pied des Alpes
Q <http://data.mimotext.uni-trier.de/entity/Q1429>	Lettres de deux amans, habitans d'une petite ville au pied des Alpes
Q <http://data.mimotext.uni-trier.de/entity/Q1429>	Lettres de deux amans, habitans d'une petite ville au pied des Alpes
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Émile
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Émile
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Émile

Which of Rousseau's novels are about 'education'?

Show the Item-Labels.

6 Label =
2 Items * 3 languages
(@en | @de | @ fr)

1.3. Operations and functions: LABEL + FILTER

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>

SELECT ?item ?itemLabel
WHERE{
  ?item wdt:P2 wd:Q2; # item is instance of literary work.
  wdt:P5 wd:Q842; # item has author (P5) Jean-Jacques Rousseau (Q842)
  wdt:P36 wd:Q2882. # item is about (P36) education (Q2882).
  ?item rdfs:label ?itemLabel.
  FILTER(LANG(?itemLabel) = "en").
}
```

Which of Rousseau's novels are about 'education'?

Show the Item-Labels in one language.

item	itemLabel
Q <http://data.mimotext.uni-trier.de/entity/Q1429>	Lettres de deux amans, habitans d'une petite ville au pied des Alpes
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Émile

<https://tinyurl.com/246lu8pc>

2 Label =
2 Items * 1 language
(@en)

1.3. Operations and functions: LABEL

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>

SELECT ?item ?itemLabel
WHERE{
  ?item wdt:P2 wd:Q2; # item is instance of literary work.
        wdt:P5 wd:Q842; # item has author (P5) Jean-Jacques Rousseau (Q842)
        wdt:P36 wd:Q2882. # item is about (P36) education (Q2882).
  ?item rdfs:label ?itemLabel.
  FILTER(LANG(?itemLabel) = "en").
}
```

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>

SELECT ?item ?itemLabel
WHERE{
  ?item wdt:P2 wd:Q2; # item is instance of literary work.
        wdt:P5 wd:Q842; # item has author (P5) Jean-Jacques Rousseau (Q842)
        wdt:P36 wd:Q2882. # item is about (P36) education (Q2882).
  SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE],en". }
}
```

rdfs:label

6 Label = 2 Items * 3
languages (@en | @de | @
fr)
+
FILTER for one language

SERVICE wikibase:label

2 Label = 2 Items

1.4. Interactive Phase

Starting point: <https://tinyurl.com/23av8x9d>

1.4. MiMoTextBase and WikibaseQueryService

Interface: <https://query.mimotext.uni-trier.de/>

The screenshot shows the DockerWikibaseQueryService interface. The header includes the title "DockerWikibaseQueryService" and three buttons: "Examples", "Help", and "More tools". The main area contains a query editor with three lines of text: "1 PREFIX wdt: <http://www.wikidata.org/prop/direct/>", "2 PREFIX wd: <http://www.wikidata.org/entity/>", and "3 |". A vertical toolbar on the left contains icons for information, predefined prefixes, formatting, example queries, deleting current query, generate Tiny-URL, and a large blue "RUN Query" button. Annotations with arrows point from text labels to these elements.

example queries (Wikidata)

Wikidata-Query-Service:
Links to helping pages

tools for using Wikidata

Query-Helper

Fullscreen

predefined
Prefixes

formatting query

example queries

deleting current query

generate Tiny-URL

RUN Query

```
1 PREFIX wdt: <http://www.wikidata.org/prop/direct/>
2 PREFIX wd: <http://www.wikidata.org/entity/>
3 |
```

1.4. Query Structure: SELECT and WHERE

Which variables are shown in the result?

```
1 PREFIX : <http://data.mimotext.uni-trier.de/entity/>  
2 PREFIX prop: <http://data.mimotext.uni-trier.de/prop/direct/>  
3  
4 SELECT * WHERE {  
5  
6 }
```

Which requirements should the result meet?

Note:

- * returns all variables defined
- variables can be named freely, but start with a ?
- triple patterns are within { }

1.4. Query Structure: Variables at object position

PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>

PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>

```
SELECT ?item ?topic
WHERE{
  ?item wdt:P2 wd:Q2; # item is instance of literary
      wdt:P5 wd:Q842; # item has author (P5) Jean-J
      wdt:P36 ?topic. # item is about any topic.
}
```

- define new variable starting with ‘?’
- it will be shown in result table

item	topic
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Q <http://data.mimotext.uni-trier.de/entity/Q3039>
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Q <http://data.mimotext.uni-trier.de/entity/Q2804>
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Q <http://data.mimotext.uni-trier.de/entity/Q3876>
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Q <http://data.mimotext.uni-trier.de/entity/Q2772>
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Q <http://data.mimotext.uni-trier.de/entity/Q2882>
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Q <http://data.mimotext.uni-trier.de/entity/Q2891>
Q <http://data.mimotext.uni-trier.de/entity/Q1027>	Q <http://data.mimotext.uni-trier.de/entity/Q3089>

1.4. Query Structure: Variables at object position + Label

“What themes appear in the French Enlightenment novel”

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>

SELECT ?topicLabel
WHERE{
  ?item wdt:P2 wd:Q2; # item is instance of literary work.
        wdt:P36 ?topic. # item is about any topic.
  ?topic rdfs:label ?topicLabel. # get the label
  FILTER(LANG(?topicLabel) = "en"). # filter language
}
```

3037 results in 329 ms

topicLabel
love
love
love
love
love
love
love
love
love
love
love
love
attraction
attraction
happiness
epistolary novel

1.4. Operations and functions: DISTINCT

“What themes appear in the French Enlightenment novel”

```
PREFIX wd: <http://data.mimotext.uni-trier.de/entity/>
PREFIX wdt: <http://data.mimotext.uni-trier.de/prop/direct/>

SELECT DISTINCT ?topicLabel
WHERE{
  ?item wdt:P2 wd:Q2; # item is instance of literary work.
        wdt:P36 ?topic. # item is about any topic.
  ?topic rdfs:label ?topicLabel. # get the label
  FILTER(LANG(?topicLabel) = "en"). # filter language
}
```



145 results in 117 ms



topicLabel
attraction
childhood
education
epistolary novel
eroticism
family
gallantary
happiness
interaction
libertinism
love
mourning

1.4. Debugging & HELP

In case of too many results or a slow request:
LIMIT

The screenshot shows the navigation bar of the MiMoTextBase website with links for 'About', 'Tutorial' (highlighted), 'MiMoTextBase', 'SPARQL-Endpoint', and 'FAQ'. Below the navigation bar is a list of help topics, each with a dropdown arrow on the right:

- Error message: Bad aggregate
- I have too many results. What can I do?
- How to find the right item / right property?
- The query is very slow or there is a time out. What can I do?
- Other helpful tutorials

The text under the second topic reads: "Sometimes you can get many results on a query which can slow down the result generation or impair the readability of some visualizations. In those cases you could add the **LIMIT**-operation (see [here](#)) to only get the TOP x-items or the **HAVING COUNT** -operation (see [here](#)) if you want only results that lie above a certain threshold. If some of the items appear more often in the results than they should, make sure that you filter all labels for one language (FR, EN, DE) separately as the graph is multilingual and the output will represent all languages within the graph, see [here](#) ."

On the right side of the page, there is a vertical teal button with the word 'HELP' written vertically, which is circled in red.

https://mimotext.github.io/MiMoTextBase_Tutorial/tutorial_index.html

1.5. Exercises

1. In which places are the novels set? Show the labels of the places.
(property 'narrative location' = P32)
2. Which thematic concepts occur at the narrative location 'Paris'?
(property 'about' = P36; 'Paris' = Q3521)
1. Which novels are about thematic concept x and have narrative form y?
(property 'about' = P36; 'narrative form' = P33)
1. Which authors wrote novels that were published in The Hague?
(work has 'author' [P5]; place of publication = P10; 'The Hague' = Q3356)

Additional question:

With the previous knowledge: Which questions about the author:s and works in the MiMoTextBase are conceivable and how can these be translated into queries?

1.5. Exercises - Solutions

1. In which places are the novels set? Show the labels of the places.

rdfs:label : <https://tinyurl.com/24aymr82>

SERVICE wikibase:label : <https://tinyurl.com/2gfkup5j>

1. Which thematic concepts occur at the narrative location 'Paris'?

<https://tinyurl.com/29uokzjz>

1. Which novels are about thematic concept x and have narrative form y?

<https://tinyurl.com/279kwvat> (one possible solution)

1. Which authors wrote novels that were published in The Hague?

<https://tinyurl.com/28mpvwj> / <https://tinyurl.com/2bfvtraf>

Additional question:

With the previous knowledge: Which questions about the author:s and works in the MiMoTextBase are conceivable and how can these be translated into queries?

References Part 1

DuCharme, Bob (2013): *Learning SPARQL*. Sebastopol, United States: O'Reilly Media.

Harris, Steve, and Andy Seaborn (2013): "SPARQL 1.1 Query Language." W3C Recommendation, March 21, 2013
<https://www.w3.org/TR/2013/REC-sparql11-query-20130321/#QueryForms>

"Getting Started", In: Maria Hinzmann, Anne Klee, Johanna Konstanciak, Julia Röttgermann, Christof Schöch, Moritz Steffes (2022): MiMoTextBase, Trier Center for Digital Humanities. URL: [data.mimotext.uni-trier.de](https://mimotext.uni-trier.de).
https://mimotext.github.io/MiMoTextBase_Tutorial/getting_started.html

Notes on the various functions in SPARQL::

Harris, Steve, and Andy Seaborn (2013): "SPARQL 1.1 Query Language." W3C Recommendation, March 21, 2013
<https://www.w3.org/TR/2013/REC-sparql11-query-20130321/>

and

Wikibooks (2022): Sparql Expressions and Functions. https://en.wikibooks.org/wiki/SPARQL/Expressions_and_Functions

SPARQL Part 2: Wikidata

2.1 About Wikidata



- Has existed since 2012
- It now comprises 100 million entities

Wikidata is a database for collecting structured data, which is organized according to a [data model](#).

The content and data on Wikidata are:

- open and free (CC0 1.0)
- multilingual
- can be processed by humans and machines
- clearly identifiable and referenced
- editable and developed collaboratively

2.2 Authors on Wikidata

What information can be found on Voltaire's Wikidata page?



<https://www.wikidata.org/wiki/Q9068>

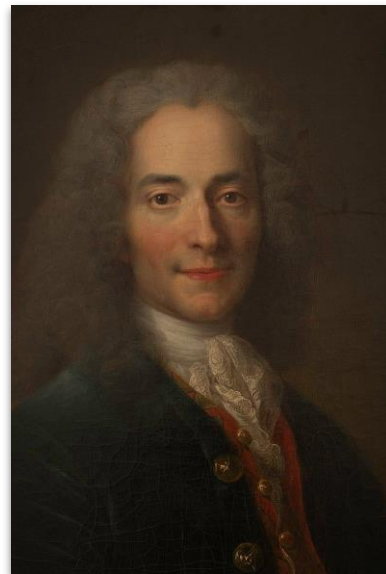
Item Discussion

Voltaire (Q9068)

French writer, historian, and philosopher (1694–1778)
François-Marie Arouet | François Marie Arouet de Voltaire | François Marie Arouet | Dictator of Letters

▼ In more languages
Configure

Language	Label	Description	Also known as
English	Voltaire	French writer, historian, and philosopher (1694–1778)	François-Marie Arouet François Marie Arouet de Voltaire François Marie Arouet Dictator of Letters
German	Voltaire	Autor, Historiker und Philosoph der französischen und europäischen Aufklärung (1694–1778)	François-Marie Arouet François Voltaire François-Marie Voltaire François Arouet François-Marie Arouet François Marie Arouet de Voltaire François Marie Arouet François Marie Arouet



2.3 Querying Wikidata

What is the coverage of the MimoText domain on Wikidata?



We are looking for all authors of the 18th century who published novels in French.

2.3 Querying Wikidata

Writers on Wikidata

```
SELECT ?author
WHERE {
  ?author wdt:P106 wd:Q36189.
}
```

[Go to query](#)

?author

'has occupation' = P106

'writer'
= Q36189

Table	
336338 results in 585 ms	
author	
Q23	
Q42	
Q91	
Q186	
Q272	
Q360	

336,338
results

2.3 Querying Wikidata

Novelists on Wikidata

```
SELECT ?author
WHERE {
  ?author wdt:P106 wd:Q6625963.
}
```

[Go to query](#)

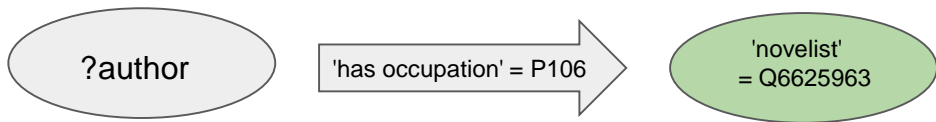


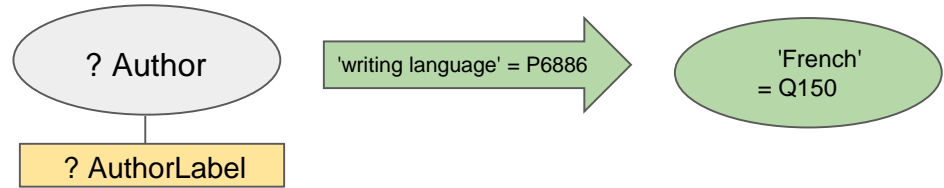
Table	
29029 results in 3058 ms	
author	
Q	wd:Q42
Q	wd:Q410
Q	wd:Q448
Q	wd:Q502
Q	wd:Q504
Q	wd:Q535

29,029
results

2.3 Querying Wikidata – Label Service

Novelists who wrote in French

```
SELECT ?author ?authorLabel
WHERE {
  ?author wdt:P106 wd:Q6625963;
  wdt:P6886 wd:Q150.
  SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]". }
}
```



[to the query](#)

Table 1086 Ergebnisse in 4 ms

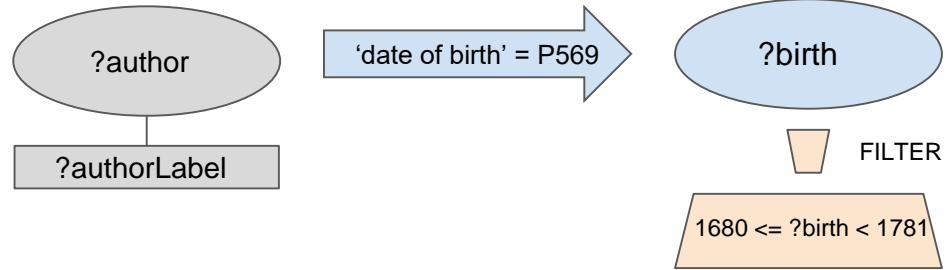
author	authorLabel
Q523039	André Theuriot
Q525710	Helen Maria Williams
Q527477	Sophie von Bawr
Q531431	Josaphat-Robert Large
Q532297	Catherine Bernard
Q537014	Jacques de Lacretelle
Q544925	Jean de Meung

1086 results

2.3 Querying Wikidata – FILTER

Novelists who wrote in French
and were born between 1680 and
1781

```
SELECT ?author ?authorLabel ?birth
WHERE {
  ?author wdt:P106 wd:Q6625963;
          wdt:P6886 wd:Q150;
          wdt:P569 ?birth.
  FILTER("1680"^^xsd:dateTime <= ?birth && ?birth < "1781"^^xsd:dateTime).
  SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]". }
}
```



[Go to query](#)

author	authorLabel	birth
wd:Q448	Denis Diderot	5 October 1713
wd:Q6527	Jean-Jacques Rousseau	28 June 1712
wd:Q49478	Pierre de Marivaux	4 February 1688
wd:Q49767	François-René de Chateaubriand	4 September 1768
wd:Q83321	Giacomo Casanova	2 April 1725

59 results

2.3 Querying Wikidata – Limitation

How can we explain the low number of 59 hits? (In comparison: 965 authors in the MiMoTextBase)

➡ Many non-canonical authors do not have an entry on Wikidata.

➡ In the result list, only those entities are displayed that fulfill all the conditions of the query.

Example: [Voltaire \(Q9068\)](#)

occupation	philosopher ▶ 3 references
	poet ▶ 1 reference
	historian ▶ 1 reference
	essayist ▶ 1 reference

No statement:

‘has occupation’: ‘novelist’

2.3 Querying Wikidata – Limitation

In the result list, **all** entities are displayed that fulfill the conditions of the query.

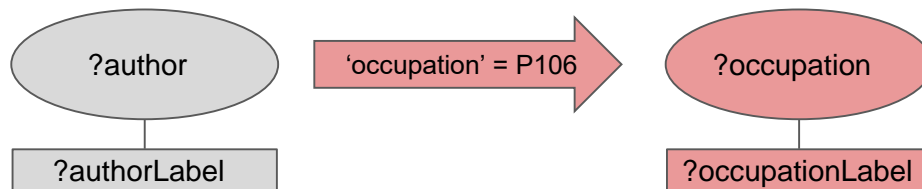
Q wd:Q448	Denis Diderot
Q wd:Q6527	Jean-Jacques Rousseau
Q wd:Q101638	Mary Wollstonecraft
Q wd:Q15975	Montesquieu

[Link to the Wikidata page of Mary Wollstonecraft](#)



2.3 Querying Wikidata

What other occupations do the novelists have?



```
SELECT ?author ?authorLabel ?birth ?occupationLabel
WHERE {
  ?author wdt:P106 wd:Q6625963;
  wdt:P6886 wd:Q150;
  wdt:P569 ?birth;
  wdt:P106 ?occupation.
FILTER("1680"^^xsd:dateTime <= ?birth && ?birth < "1781"^^xsd:dateTime).
SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]". }
```

[Go to query](#)

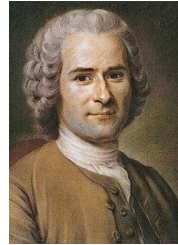
author	authorLabel	birth	occupationLabel
Q448	Denis Diderot	5 October 1713	writer
Q448	Denis Diderot	5 October 1713	historian
Q448	Denis Diderot	5 October 1713	playwright
Q448	Denis Diderot	5 October 1713	translator
Q448	Denis Diderot	5 October 1713	encyclopédistes

Getting an overview: What other occupations do the novelists have, and how often do they occur?



Diderot

historian
philosopher
lexicographer
essayist
translator



Rousseau

botanist
philosopher
novelist
naturalist
pedagogue



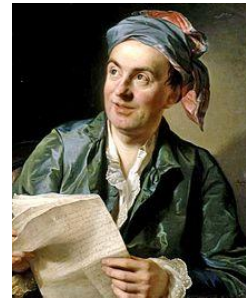
Isabelle de Charrière

composer
philosopher
translator
novelist
poet



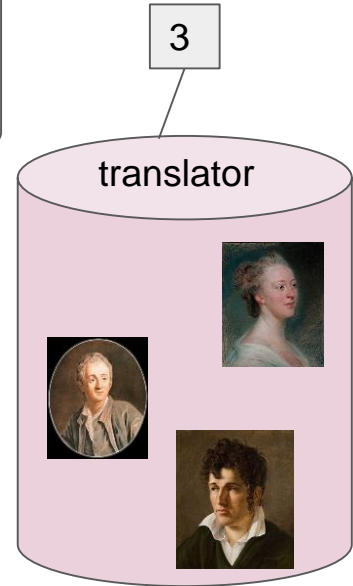
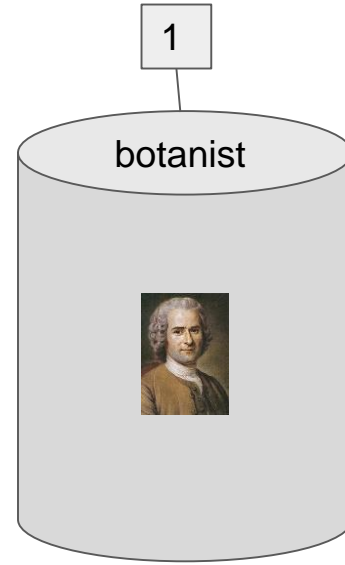
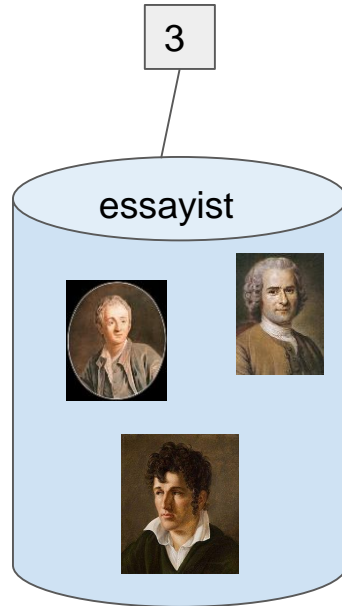
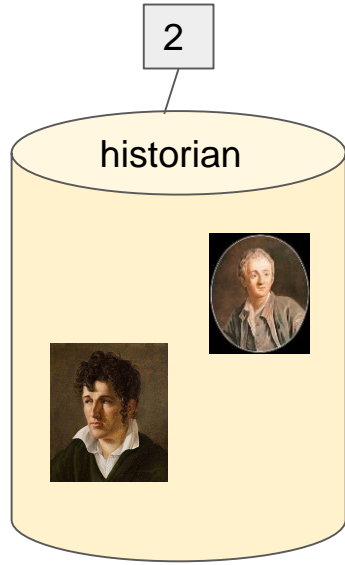
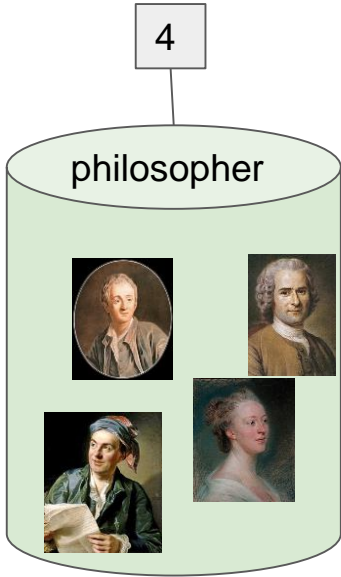
Chateaubriand

historian
politician
journalist
essayist
translator



Marmontel

philosopher
politician
journalist
poet
playwright



2.3 Querying Wikidata – COUNT & GROUP BY

What other occupations do the novelists have, and how often do they occur?

```
SELECT ?occupationLabel (COUNT(?author) as ?count_occupation)
WHERE {
  ?author wdt:P106 wd:Q6625963;
          wdt:P6886 wd:Q150;
          wdt:P569 ?birth;
          wdt:P106 ?occupation.
  FILTER("1680"^^xsd:dateTime <= ?birth && ?birth < "1781"^^xsd:dateTime).
  SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]". }
}
GROUP BY ?occupationLabel
```

occupationLabel	count_occupation
writer	47
businessperson	1
historian	7
translator	14
governess	1
travel writer	1

Group the results

GROUP BY ?occupationLabel

COUNT(?author) as
?count_occupation

[Go to query](#)

Note:

A variable that is used for grouping must always appear in the SELECT statement.

Here: ?occupationLabel

2.3 Querying Wikidata – ORDER BY

What other occupations do the novelists have, and how often do they occur?

```
SELECT ?occupationLabel (COUNT(?author) as ?count_occupation)
WHERE {
  ?author wdt:P106 wd:Q6625963;
         wdt:P6886 wd:Q150;
         wdt:P569 ?birth;
         wdt:P106 ?occupation.
  FILTER("1680"^^xsd:dateTime <= ?birth && ?birth < "1781"^^xsd:dateTime).
  SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]". }
}
GROUP BY ?occupationLabel
ORDER BY DESC (?count_occupation)
```

occupationLabel	count_occupation
novelist	59
writer	47
playwright	23
translator	14

Sort numeric values in the result

ORDER BY DESC
(?count_occupation)

[Go to query](#)

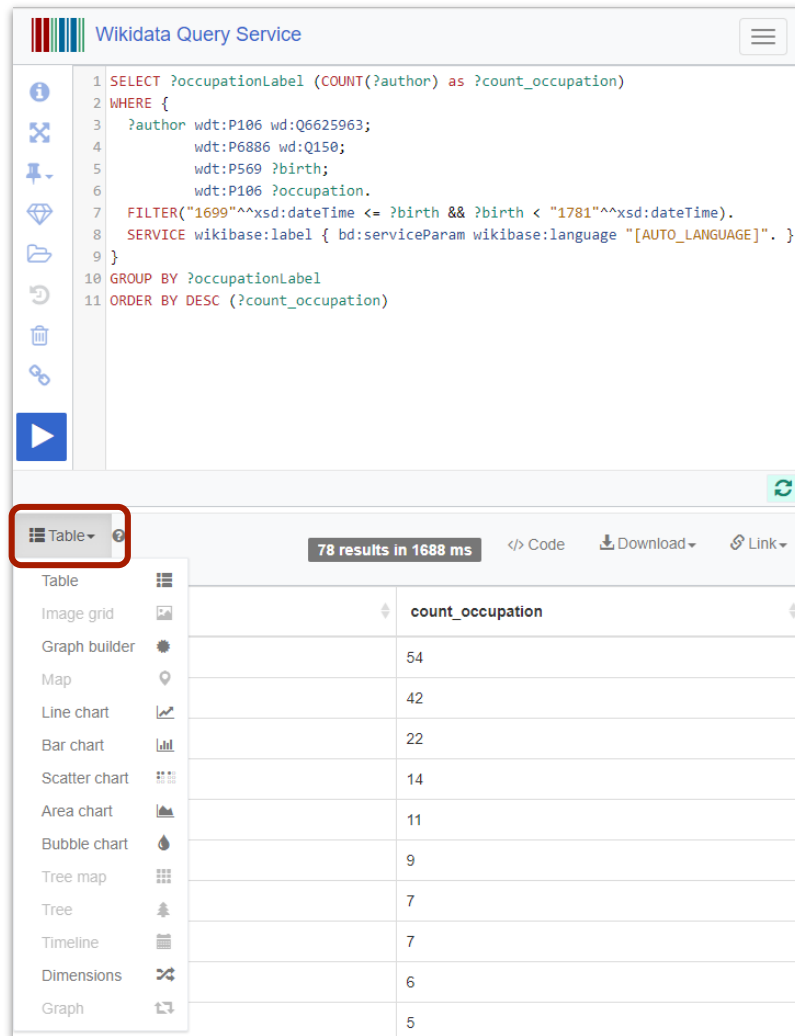


Sorted in
descending
order by
number

2.3 Querying Wikidata

Visualization options for the query results

In our tutorial, you will find an [overview](#) of different visualization options with the Wikidata Query Service.



The screenshot displays the Wikidata Query Service interface. At the top, the title "Wikidata Query Service" is visible. Below it, a SPARQL query is entered in a text area:

```
1 SELECT ?occupationLabel (COUNT(?author) as ?count_occupation)
2 WHERE {
3   ?author wdt:P106 wd:Q6625963;
4           wdt:P6886 wd:Q150;
5           wdt:P569 ?birth;
6           wdt:P106 ?occupation.
7   FILTER("1699"^^xsd:dateTime <= ?birth && ?birth < "1781"^^xsd:dateTime).
8   SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]". }
9 }
10 GROUP BY ?occupationLabel
11 ORDER BY DESC (?count_occupation)
```

Below the query editor, a red box highlights the "Table" visualization option in the dropdown menu. The results are displayed in a table format, showing 78 results in 1688 ms. The table has two columns: "occupationLabel" and "count_occupation".

occupationLabel	count_occupation
	54
	42
	22
	14
	11
	9
	7
	7
	6
	5

2.3 Querying Wikidata – defaultView

Visualization as a bubble chart

```
#defaultView:BubbleChart
```

```
SELECT ?occupationLabel (COUNT(?author) as ?count_occupation)
WHERE {
    ?author wdt:P106 wd:Q6625963;
           wdt:P6886 wd:Q150;
           wdt:P569 ?birth;
           wdt:P106 ?occupation.
    FILTER("1680"^^xsd:dateTime <= ?birth && ?birth < "1781"^^xsd:dateTime).
    SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]". }
}
GROUP BY ?occupationLabel
ORDER BY DESC (?count_occupation)
```

[Go to query](#)

2.4 Exercise

Write a query to find people with another occupation (composers/theologians/ philosophers) from a specific century.

	occupation X
Step 1: find people with a certain occupation and born in the ?th century	initial query
Step 2: retrieve their places of birth	
Step 3: sort the result in ascending order based on the dates of birth	
Step 4: Visualize the result as a timeline	

2.4 Solutions

	Composers	Theologians	Philosophers
Step 1: find people with a certain occupation and born in the ?th century	https://w.wiki/6PcH	https://w.wiki/6tYU	https://w.wiki/6tYV
Step 2: retrieve their places of birth	https://w.wiki/6PgD	https://w.wiki/6Pcb	https://w.wiki/6Pca
Step 3: sort the result in ascending order based on the dates of birth	https://w.wiki/6Pci	https://w.wiki/6Pch	https://w.wiki/6Pcf
Step 4: Visualize the result as a timeline	https://w.wiki/6Pcm	https://w.wiki/6Pco	https://w.wiki/6Pcq

References Part 2

Vrandečić, Denny / Krötzsch, Markus (2014). "Wikidata: a free collaborative knowledgebase", in: *Communications of the ACM* 57(10): 78–85. <https://doi.org/10.1145/2629489>.

Wikidata (2022): Introduction. <https://www.wikidata.org/wiki/Wikidata:Introduction>, 06.07.2023.

Zhao, Fudie (2022): "A systematic review of Wikidata in Digital Humanities projects", in: *Digital Scholarship in the Humanities*: fqac083. [10.1093/llc/fqac083](https://doi.org/10.1093/llc/fqac083).

Helpful tutorials:

Wikidata (2022): SPARQL tutorial. https://www.wikidata.org/wiki/Wikidata:SPARQL_tutorial, 06.07.2023.

Wikidata (2022): Wikidata Tours. <https://www.wikidata.org/wiki/Wikidata:Tours>, 06.07.2023.

Wikimedia Israel (2020): Wikidata Query Service Tutorial. <https://wdqs-tutorial.toolforge.org/>, 06.07.2023.



3 Federated Queries

How to query multiple knowledge graphs with one query?



Rheinland-Pfalz
MINISTERIUM FÜR
WISSENSCHAFT, WEITERBILDUNG
UND KULTUR



MiMoText
Mining and Modeling Text

3.1 What are Federated Queries?

“SPARQL can be used to express queries across diverse data sources, whether the data is stored natively as RDF or viewed as RDF via middleware.”

W3C Recommendation 21 March 2013

<https://www.w3.org/TR/2013/REC-sparql11-federated-query-20130321/>

3.1 Data as RDF (without middleware)

```
<rdf:RDF>
  <rdf:Description rdf:nodeID="service">
    <rdf:type rdf:resource="http://www.w3.org/ns/sparql-service-description#Service"/>
    <endpoint rdf:resource="http://zora.uni-trier.de:9999/bigdata/namespace/wdq/sparql"/>
    <supportedLanguage rdf:resource="http://www.w3.org/ns/sparql-service-description#SPARQL10Query"/>
    <supportedLanguage rdf:resource="http://www.w3.org/ns/sparql-service-description#SPARQL11Query"/>
    <supportedLanguage rdf:resource="http://www.w3.org/ns/sparql-service-description#SPARQL11Update"/>
    <feature rdf:resource="http://www.w3.org/ns/sparql-service-description#BasicFederatedQuery"/>
    <feature rdf:resource="http://www.bigdata.com/rdf#/features/KB/Mode/Triples"/>
    <inputFormat rdf:resource="http://www.w3.org/ns/formats/RDF_XML"/>
    <inputFormat rdf:resource="http://www.w3.org/ns/formats/N-Triples"/>
    <inputFormat rdf:resource="http://www.w3.org/ns/formats/Turtle"/>
    <inputFormat rdf:resource="http://www.w3.org/ns/formats/N3"/>
    <inputFormat rdf:resource="http://www.wiwiss.fu-berlin.de/suhl/bizer/TriG/Spec"/>
    <inputFormat rdf:resource="http://sw.deri.org/2008/07/n-quads/#n-quads"/>
    <inputFormat rdf:resource="http://www.w3.org/ns/formats/SPARQL_Results_XML"/>
    <inputFormat rdf:resource="http://www.w3.org/ns/formats/SPARQL_Results_JSON"/>
    <inputFormat rdf:resource="http://www.w3.org/ns/formats/SPARQL_Results_CSV"/>
    <inputFormat rdf:resource="http://www.w3.org/ns/formats/SPARQL_Results_TSV"/>
    <resultFormat rdf:resource="http://www.w3.org/ns/formats/RDF_XML"/>
    <resultFormat rdf:resource="http://www.w3.org/ns/formats/N-Triples"/>
    <resultFormat rdf:resource="http://www.w3.org/ns/formats/Turtle"/>
    <resultFormat rdf:resource="http://www.w3.org/ns/formats/N3"/>
    <resultFormat rdf:resource="http://www.wiwiss.fu-berlin.de/suhl/bizer/TriG/Spec"/>
    <resultFormat rdf:resource="http://www.w3.org/ns/formats/SPARQL_Results_XML"/>
    <resultFormat rdf:resource="http://www.w3.org/ns/formats/SPARQL_Results_JSON"/>
    <resultFormat rdf:resource="http://www.w3.org/ns/formats/SPARQL_Results_CSV"/>
    <resultFormat rdf:resource="http://www.w3.org/ns/formats/SPARQL_Results_TSV"/>
    <defaultDataset rdf:nodeID="defaultDataset"/>
  </rdf:Description>
  <rdf:Description rdf:nodeID="defaultDataset">
    <rdf:type rdf:resource="http://www.w3.org/ns/sparql-service-description#Dataset"/>
    <rdf:type rdf:resource="http://rdfs.org/ns/void#Dataset"/>
    <title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">wdq</title>
    <Namespace rdf:datatype="http://www.w3.org/2001/XMLSchema#string">wdq</Namespace>
    <sparqlEndpoint rdf:resource="http://zora.uni-trier.de:9999/bigdata/namespace/wdq/sparql/wdq/sparql"/>
    <uriRegexPattern rdf:datatype="http://www.w3.org/2001/XMLSchema#string">^.*</uriRegexPattern>
```


3.1 Federated Query in DockerWikibaseQuery Interface

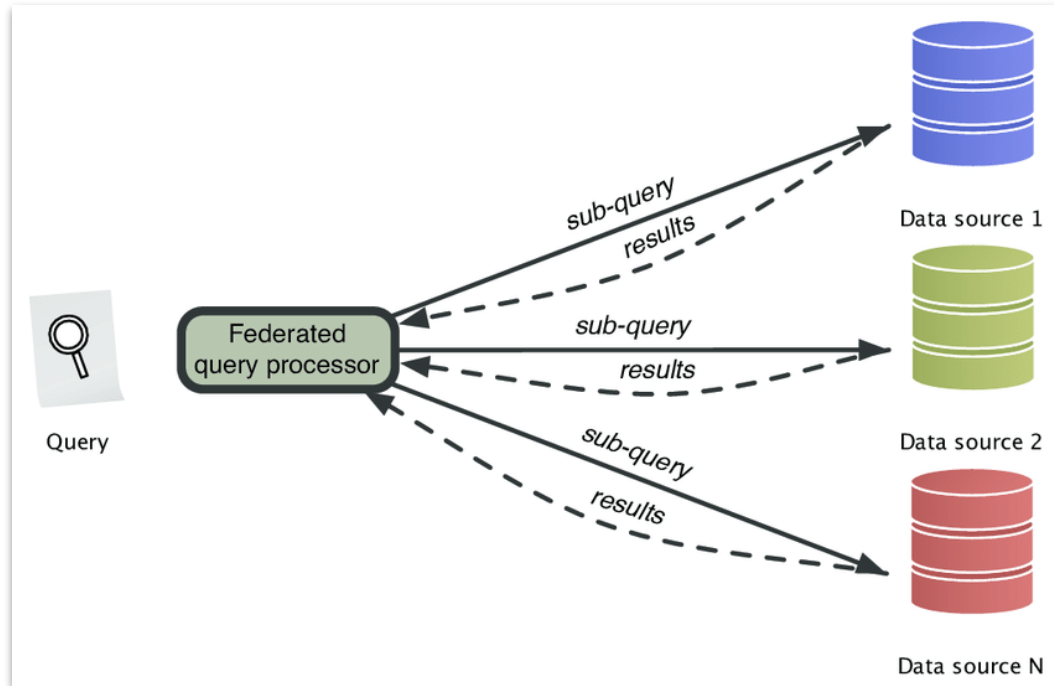
```
1 # What are narrative location of the novels, show their match on Wikidata and geocoordinates
2 PREFIX wid: <http://www.wikidata.org/entity/> #wikidata wd
3 PREFIX wdt: <http://www.wikidata.org/prop/direct/> #wikidata wdt
4
5 PREFIX wd:<http://data.mimotext.uni-trier.de/entity/>
6 PREFIX wdt:<http://data.mimotext.uni-trier.de/prop/direct/>
7
8 SELECT DISTINCT ?item ?itemLabel ?nar_loc ?nar_locLabel ?WikiDataEntity ?coordinateLocation
9 WHERE { ?item wdt:P32 ?nar_loc.
10   ?nar_loc wdt:P13 ?WikiDataEntity.
11
12   SERVICE <https://query.wikidata.org/sparql> {
13     ?WikiDataEntity wdt:P625 ?coordinateLocation
14   }
15
16   SERVICE wikibase:label { bd:serviceParam wikibase:language "en" . }
17 }
```

MiMoTextBase

Wikidata

<https://tinyurl.com/2qe24gbp>

3.1 How do queries work across multiple knowledge graphs?



3.1 Basics Semantic Web & LOD and RDF & SPARQL

5 Star Data Schema

★ Available on the web (whatever format) but with an open license, to be Open Data

★★ Available as machine-readable structured data (e.g. excel instead of image scan of a table)

★★★ as (2) plus non-proprietary format (e.g. CSV instead of excel)

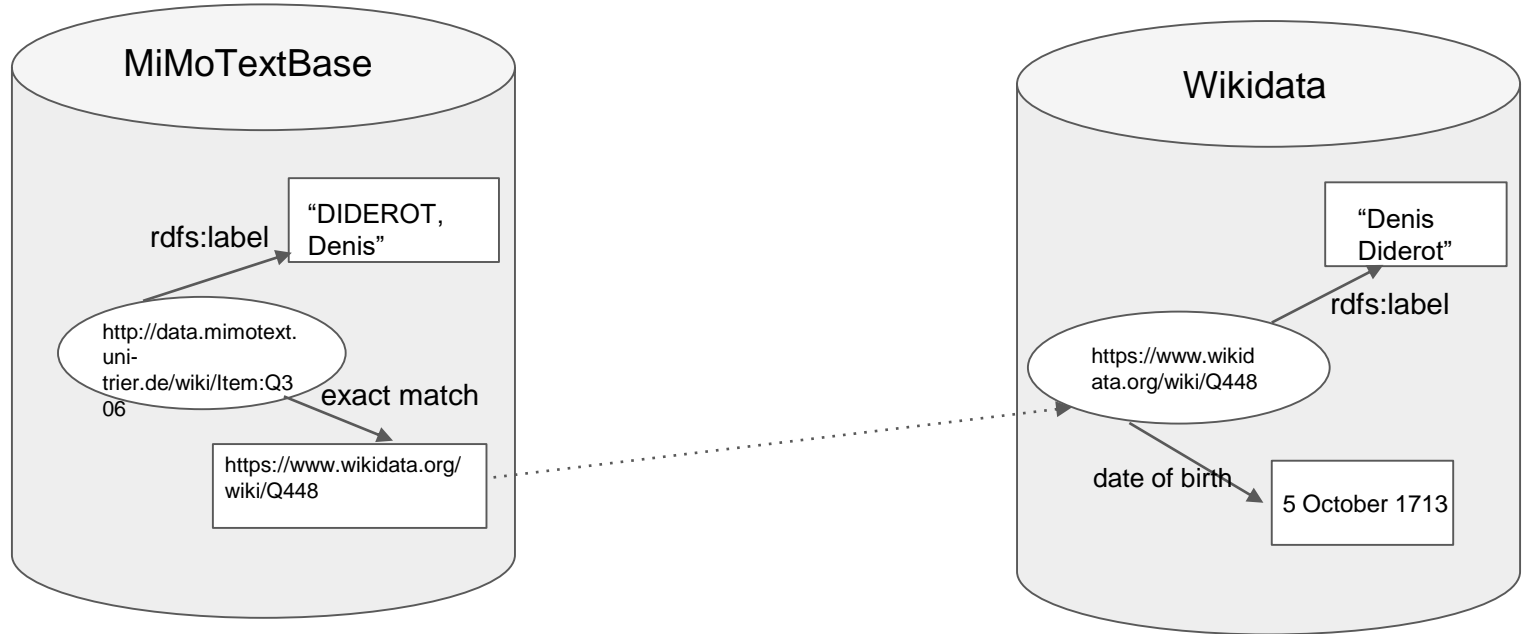
★★★★ All the above plus, Use open standards from W3C (RDF and SPARQL) to identify things, so that people can point at your stuff

★★★★★ All the above, plus: Link your data to other people's data to provide context




Berners-Lee (2006)

3.1 Linked Data between two Knowledge Graphs



Item Q306 [Diderot] in MiMoTextBase



Item Discussion

DIDEROT, Denis (Q306)

No description defined

▼ In more languages
Configure

Language	Label	Description	Also known as
English	DIDEROT, Denis	No description defined	

All entered languages

Statements

name	QID	DIDEROT, Denis (français)	▼ 0 references
instance of	QID	human	▼ 0 references
occupation	QID	author	▼ 0 references
<u>exact match</u>	QID	http://www.wikidata.org/entity/Q448	▼ 0 references

Property:P13


<http://data.mimotext.uni-trier.de/wiki/Item:Q306>

Left sidebar:

- Main page
- Recent changes
- Random page
- Help about MediaWiki
- Tools
- What links here
- Related changes
- Special pages
- Printable version
- Permanent link
- Page information
- Concept URI
- In other languages
- Add links

<http://data.mimotext.uni-trier.de/wiki/Item:Q306>

Item Q448 [Diderot] on Wikidata



Item [Discussion](#) Rea

Denis Diderot (Q448)

French Enlightenment philosopher writer and encyclopædist (1713–1784)
Diderot

[In more languages](#)
[Configure](#)

Language	Label	Description	Also known as
English	Denis Diderot	French Enlightenment philosopher writer and encyclopædist (1713–1784)	Diderot
German	Denis Diderot	französischer Schriftsteller und Philosoph (1713–1784)	
French	Denis Diderot	écrivain, philosophe et encyclopédiste français	Diderot Diderot, Denis
Bavarian	Denis Diderot	No description defined	

[All entered languages](#)

Statements

instance of	 human
	1 reference
part of	 Diderot et d'Alembert
	2 references

Wikipedia (96 entries)

af	Denis Diderot
am	ድንስ ዲድሮት
an	Denis Diderot
ar	دنيس ديدرو
arz	دنيس ديدرو
ast	Denis Diderot
ay	Denis Diderot
az	Deni Didro
ba	Дени Дидро
be-tarask	Дэні Дыдро
be	Дэні Дзідро
bg	Дени Дидро
bo	ཉེན་ལྷན་པོ་
br	Denis Diderot
bs	Denis Diderot
ca	Denis Diderot
cs	Denis Diderot
cv	Дидро, Дени
cy	Denis Diderot
da	Denis Diderot
de	Denis Diderot
diq	Denis Diderot
el	Ντενί Ντιντερό
en	Denis Diderot
eo	Denis Diderot

3.2 Examples (SPARQL)

How to query multiple knowledge graphs with one query?

Wikidata Query Service/User Manual/SPARQL Federation endpoints

Page [Discussion](#)

[Read](#) [Edit](#) [View history](#)

< [Wikidata Query Service](#) | [User Manual](#)

[Translate this page](#)

Languages: [Bahasa Indonesia](#) [Bân-lâm-gú](#) **[English](#)** [Türkçe](#) [français](#) [italiano](#) [polski](#) [العربية](#) [தமிழ்](#) [ไทย](#) [தூலீர்](#) [中文](#) [日本語](#) [한국어](#)

We allow [SPARQL Federated Queries](#) to call out to a selected number of external databases. Supported endpoints are:

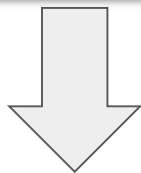
URL	Owner (docs)
http://sparql.europeana.eu/	Europeana
http://data.cervantesvirtual.com/openrdf-sesame/repositories/data	Biblioteca Virtual Miguel de Cervantes
 http://datos.bne.es/sparql	Biblioteca Nacional de España
 https://bnb.data.bl.uk/sparql	British National Bibliography
http://edan.si.edu/saam/sparql	Smithsonian American Art Museum
 https://data.bnf.fr/current/sparql.html	Bibliothèque nationale de France
http://dbpedia.org/sparql	DBPedia
http://vocab.getty.edu/sparql.json	Getty Vocabularies
http://rdf.insee.fr/sparql	INSEE
http://dati.camera.it/sparql	Italian Chamber of Deputies
http://nomisma.org/query	Nomisma.org
http://data.plan4all.eu/sparql	Smart Points of Interest
http://opendatacommunities.org/sparql	UK Department for Communities and Local Government
http://statistics.data.gov.uk/sparql	UK Office for National Statistics
https://data.ordnancesurvey.co.uk/datasets/os-linked-data/apis/sparql	UK ordnance survey
http://linkeddata.uriburner.com/sparql	URI Burner
http://sparql.wikiPathways.org/sparql	WikiPathways

https://www.mediawiki.org/wiki/Wikidata_Query_Service/User_Manual/SPARQL_Federation_endpoints

3.2 Federated Queries

Step 1: Where were French novels published 1751-1800*?

```
1 PREFIX wd:<http://data.mimotext.uni-trier.de/entity/>
2 PREFIX wdt:<http://data.mimotext.uni-trier.de/prop/direct/>
3 SELECT DISTINCT ?item ?pub_loc
4 WHERE { ?item wdt:P10 ?pub_loc
5 }
6
```



P10
place of publication

Query:
<https://tinyurl.com/2lz3xwss>

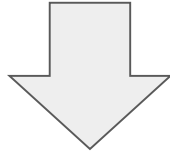
item	pub_loc
Q <http://data.mimotext.uni-trier.de/entity/Q1312>	Q <http://data.mimotext.uni-trier.de/entity/Q3482>
Q <http://data.mimotext.uni-trier.de/entity/Q1870>	Q <http://data.mimotext.uni-trier.de/entity/Q3482>
Q <http://data.mimotext.uni-trier.de/entity/Q1213>	Q <http://data.mimotext.uni-trier.de/entity/Q3482>
Q <http://data.mimotext.uni-trier.de/entity/Q1214>	Q <http://data.mimotext.uni-trier.de/entity/Q3482>

* the knowledge graph contains in total only novels of this period

3.2 Federated Queries

Step 2: Where were French novels published in 1751-1800? (with label)

```
1 PREFIX wd:<http://data.mimotext.uni-trier.de/entity/>
2 PREFIX wdt:<http://data.mimotext.uni-trier.de/prop/direct/>
3 SELECT DISTINCT ?item ?itemLabel ?pub_loc ?pub_locLabel
4 WHERE { ?item wdt:P10 ?pub_loc.
5 SERVICE wikibase:label { bd:serviceParam wikibase:language "en".}
6 }
7
```



P10
place of publication

Query:
<https://tinyurl.com/2hzggsob>

item	itemLabel	pub_loc	pub_locLabel
Q <http://data.mimotext.uni-trier.de/entity/Q1312>	Le palais du silence	Q <http://data.mimotext.uni-trier.de/entity/Q3482>	Amsterdam
Q <http://data.mimotext.uni-trier.de/entity/Q1213>	Amours d'Alzidor et de Charisée	Q <http://data.mimotext.uni-trier.de/entity/Q3482>	Amsterdam
Q <http://data.mimotext.uni-trier.de/entity/Q1214>	Le tombeau philosophique	Q <http://data.mimotext.uni-trier.de/entity/Q3482>	Amsterdam

3.2 Federated Queries

Step 3: Where were French novels published 1751-1800, what items does that correspond to on Wikidata, and what are the corresponding geocoordinates?

```
1 PREFIX wid: <http://www.wikidata.org/entity/> #wikidata wd
2 PREFIX widt: <http://www.wikidata.org/prop/direct/> #wikidata wdt
3 PREFIX wd:<http://data.mimotext.uni-trier.de/entity/>
4 PREFIX wdt:<http://data.mimotext.uni-trier.de/prop/direct/>
5 SELECT DISTINCT ?item ?itemLabel ?pub_loc ?pub_locLabel ?WikiDataEntity ?coordinateLocation
6 WHERE { ?item wdt:P10 ?pub_loc.
7   ?pub_loc wdt:P13 ?WikiDataEntity.
8   #Federated Query -> Wikidata
9   SERVICE <https://query.wikidata.org/sparql> {
10     ?WikiDataEntity widt:P625 ?coordinateLocation
11   }
12   SERVICE wikibase:label { bd:serviceParam wikibase:language "en" . }
13 }
```

P10
place of publication

P625
coordinate location

Query:
<https://tinyurl.com/2qmtjj3c>

item	itemLabel	pub_loc	pub_locLabel	WikiDataEntity	coordinateLocation
Q1765	La rhétorique des putains	Q3287	Rome	wd:Q220	Point(12 482777777 41.893055555)
Q2426	Petit-Jacques et Georgette	Q3303	City of Brussels	wd:Q239	Point(4.351666666 50.846666666)
Q2098	Anna Rose-Tree	Q3303	City of Brussels	wd:Q239	Point(4.351666666 50.846666666)

3.2 Federated Queries

Step 4: Where were French novels published 1751-1800, what items does that correspond to on Wikidata, and what are the corresponding geocoordinates? (with map)

```
1 #defaultView:Map
2 PREFIX wd: <http://www.wikidata.org/entity/> #wikidata wd
3 PREFIX wdt: <http://www.wikidata.org/prop/direct/> #wikidata wdt
4 PREFIX wd:<http://data.mimotext.uni-trier.de/entity/>
5 PREFIX wdt:<http://data.mimotext.uni-trier.de/prop/direct/>
6 SELECT DISTINCT ?item ?itemLabel ?pub_loc ?pub_locLabel ?WikiDataEntity ?coordinateLocation
7 WHERE { ?item wdt:P10 ?pub_loc.
8   ?pub_loc wdt:P13 ?WikiDataEntity.
9   #Federated Query -> Wikidata
10  SERVICE <https://query.wikidata.org/sparql> {
11    ?WikiDataEntity wdt:P625 ?coordinateLocation
12  }
13  SERVICE wikibase:label { bd:serviceParam wikibase:language "en" . }
14 }
```



P10
place of publication

P625
coordinate location

Query:

<https://tinyurl.com/2puufny6>

3.2 Federated Queries

Step 5: Where were French novels published 1751-1800, what items does that correspond to on Wikidata, and what are the corresponding geocoordinates? (with map & cluster view)

```
1 #defaultView:Map{"markercluster":"true"}
2 PREFIX wid: <http://www.wikidata.org/entity/> #wikidata wd
3 PREFIX widt: <http://www.wikidata.org/prop/direct/> #wikidata wdt
4 PREFIX wd:<http://data.mimotext.uni-trier.de/entity/>
5 PREFIX wdt:<http://data.mimotext.uni-trier.de/prop/direct/>
6 SELECT DISTINCT ?item ?itemLabel ?pub_loc ?pub_locLabel ?WikiDataEntity ?coordinateLocation
7 WHERE { ?item wdt:P32 ?pub_loc. # novels and place of publication (P10)
8 ?pub_loc wdt:P13 ?WikiDataEntity. # places of publication and wikidata match
9 #Federated Query -> Wikidata
10 SERVICE <https://query.wikidata.org/sparql> {
11 ?WikiDataEntity widt:P625 ?coordinateLocation # wikidata matches and coordinate locations
12 }
13 SERVICE wikibase:label { bd:serviceParam wikibase:language "en" . }
14 }
```

P10
place of publication

P625
coordinate location

Query:

<https://tinyurl.com/2lu27oxe>



3.2 Federated Queries

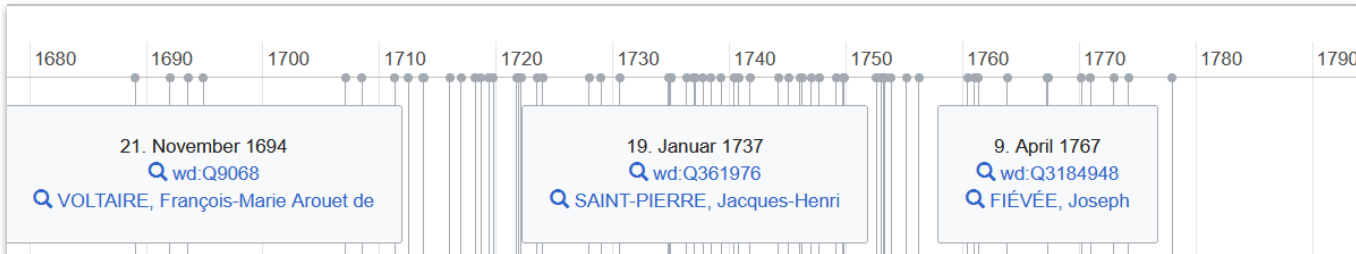
Show the authors, their equivalent on Wikidata and their date of birth (Timeline)

```
1 # show authors, their Wikidata match, their birth dates in a timeline
2 #defaultView:Timeline
3 PREFIX wid: <http://www.wikidata.org/entity/> #wikidata prefix definition for entity
4 PREFIX widt: <http://www.wikidata.org/prop/direct/> #wikidata prefix definition for property
5 PREFIX wd:<http://data.mimotext.uni-trier.de/entity/> #mimotext prefix for entity is wd
6 PREFIX wdt:<http://data.mimotext.uni-trier.de/prop/direct/> #mimotext prefix for property is wdt
7
8 SELECT ?author ?authorLabel ?wikidata ?birth ?image
9 WHERE {
10   ?author wdt:P13 ?wikidata.
11   ?author rdfs:label ?authorLabel .
12   FILTER(lang(?authorLabel) = "en")
13   SERVICE <https://query.wikidata.org/sparql> {
14     ?wikidata widt:P569 ?birth .
15   }
```

P13
exact match

P569
date of birth

Query:
<https://tinyurl.com/2q6tn2a2>



3.3 Exercises

Given is the following query that asks for authors in MiMoText and their birthdates on Wikidata and displays the result as a timeline:

<https://tinyurl.com/2n4d5cgp> .

- 1. Expand the query by adding pictures of the authors.**
2. (For advanced users: Filter the birth dates by a decade of your choice, e.g. all authors born between 1740 and 1750.)

Note: The property for images on Wikidata is called [P18](#).

Tip: Read our tutorial page on OPTIONAL:

https://mimotext.github.io/MiMoTextBase_Tutorial/optional.html .

<https://www.wikidata.org/wiki/Property:P18>

Solution I

```
1 # show authors, their Wikidata match, their birth dates in a timeline
2 #defaultView:Timeline
3 PREFIX wid: <http://www.wikidata.org/entity/> #wikidata prefix definition for entity
4 PREFIX widt: <http://www.wikidata.org/prop/direct/> #wikidata prefix definition for property
5 PREFIX wd:<http://data.mimotext.uni-trier.de/entity/> #mimotext prefix for entity is wd
6 PREFIX wdt:<http://data.mimotext.uni-trier.de/prop/direct/> #mimotext prefix for property is wdt
7
8 SELECT ?author ?authorLabel ?wikidata ?birth ?image
9 WHERE {
10   ?author wdt:P11 ?occupation .
11   ?author wdt:P13 ?wikidata.
12   ?author rdfs:label ?authorLabel .
13   FILTER(lang(?authorLabel) = "en")
14   SERVICE <https://query.wikidata.org/sparql> {
15     ?wikidata widt:P569 ?birth .
16   OPTIONAL { ?wikidata widt:P18 ?image.}
17 }
18 }
```

Solution II

```
1 # show authors, their Wikidata match, their birth dates in a timeline
2 #defaultView:Timeline
3 PREFIX wid: <http://www.wikidata.org/entity/> #wikidata prefix definition for entity
4 PREFIX widt: <http://www.wikidata.org/prop/direct/> #wikidata prefix definition for property
5 PREFIX wd:<http://data.mimotext.uni-trier.de/entity/> #mimotext prefix for entity is wd
6 PREFIX wdt:<http://data.mimotext.uni-trier.de/prop/direct/> #mimotext prefix for property is wdt
7
8 SELECT DISTINCT ?author ?authorLabel ?wikidata ?birth ?image
9 WHERE {
10   ?author wdt:P11 ?occupation .
11   ?author wdt:P13 ?wikidata.
12   ?author rdfs:label ?authorLabel .
13   FILTER(lang(?authorLabel) = "de")
14   SERVICE <https://query.wikidata.org/sparql> {
15     ?wikidata widt:P569 ?birth .
16     FILTER("1740-01-01"^^xsd:dateTime <= ?birth && ?birth< "1750-12-30"^^xsd:dateTime).
17     OPTIONAL { ?wikidata widt:P18 ?image.}
18   }
19 }
```

References part 3

How to prepare your data

Hooland, Seth van, and Ruben Verborgh. *Linked Data for Libraries, Archives and Museums: How to Clean, Link and Publish Your Metadata*. London: Facet Publishing, 2014. <http://ebookcentral.proquest.com/lib/uni-trier/detail.action?docID=1993231>.

On Federated Queries

Prud'hommeaux, Eric, and Carlos Buil-Aranda. "SPARQL 1.1 Federated Query." W3C Recommendation, March 21, 2013. <https://www.w3.org/TR/sparql11-federated-query/>.

Lincoln, Matthew. "Using SPARQL to Access Linked Open Data." Edited by Fred Gibbs. *The Programming Historian*, no. 4 (November 24, 2015). <https://doi.org/10.46430/phen0047>.

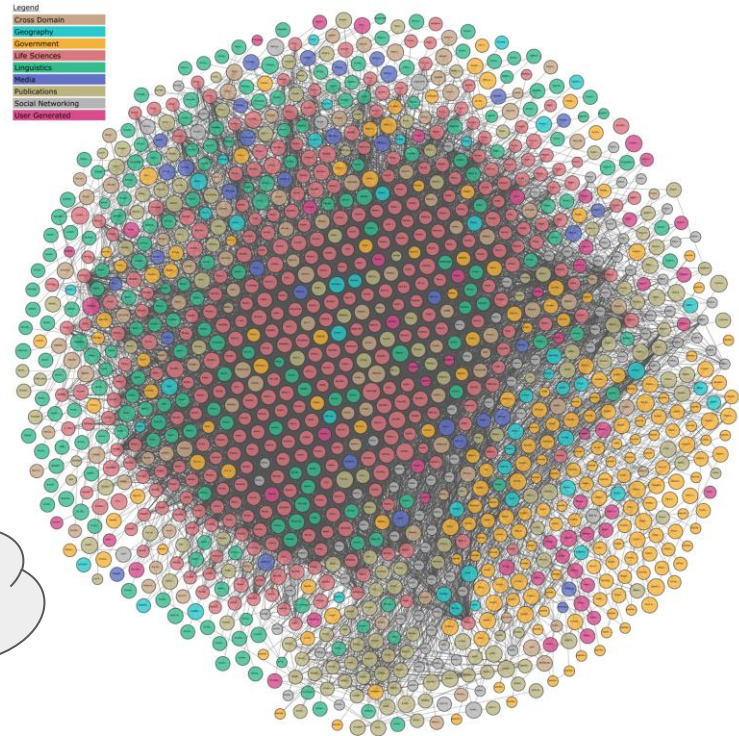
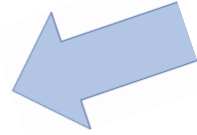
Tutorial on "Federated Queries"

"Federated Queries", In: Maria Hinzmann, Anne Klee, Johanna Konstanciak, Julia Röttgermann, Christof Schöch, Moritz Steffes: MiMoTextBase, Trier Center for Digital Humanities, 2022. URL: [data.mimotext.uni-trier.de. https://mimotext.github.io/MiMoTextBase_Tutorial/federated.html](https://mimotext.github.io/MiMoTextBase_Tutorial/federated.html)

Outlook and Discussion

Outlook: The LOD paradigm for the humanities

Legend



The Linked Open Data Cloud from lod-cloud.net

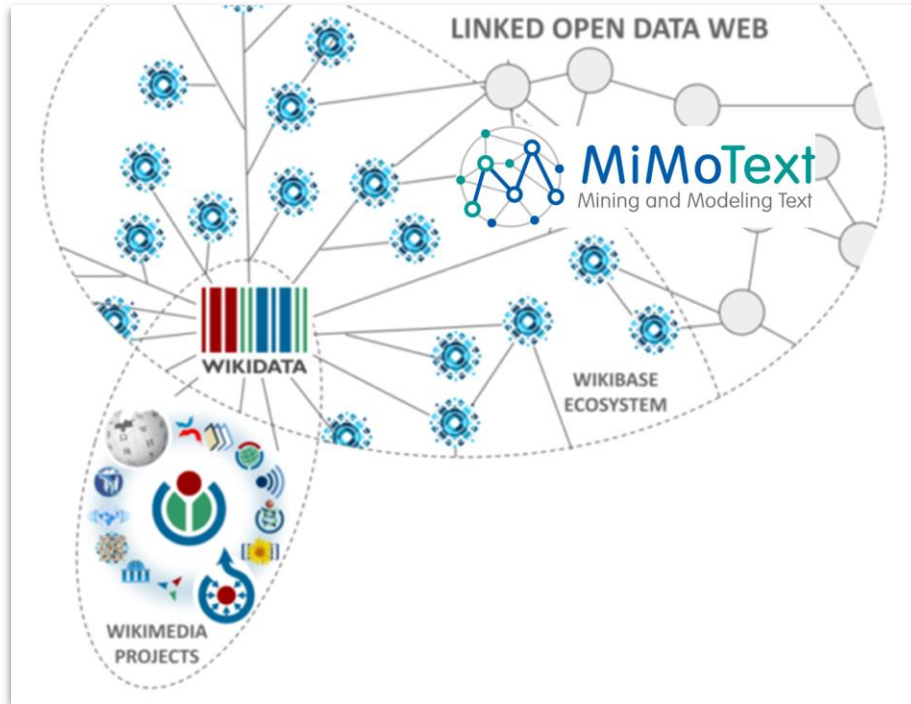


Outlook: Linked Open Data & Knowledge Graphs in the next days



- Tuesday, 11/July/2023
 - 9:00am - 5:00pm (Location: Workshop Venue 2)
 - Semantic Web and Linked Open Data in Historical Sciences
- Wednesday, 12/July/2023
 - 4:00pm - 5:30pm, SP-W4F: Correspondence and networks (Location MCG-F)
 - Towards a Dynamic Knowledge Graph of a Non-Western Book Tradition (3rd short presentation)
 - 6:00pm - 8:00pm, Poster Reception (Location: MCG Gallery)
 - A Feminist Approach to Linked Open Data: Making the Women Film Pioneers Project FAIR
 - Linked Open Data for Tibetan-Himalayan Researchers: Opportunities for Collaboration in User Experience Studies
- Thursday, 13/July/2023
 - 4:00pm – 5:30pm, LP-T4G: Linked open data (Location: MCG-A)
 - Representing provenance and track changes of cultural heritage metadata in RDF: a survey of existing approaches
 - Representation of critical discourses in the humanities within Wikidata
 - Collaborative Data Remediation for the Semantic Web
- Friday, 14/July/2023
 - 2:00pm - 3:30pm, LP-F3D: Network analysis (Location: MCG-D)
 - A Knowledge Graph for Humanities Research
 - 2:00pm - 3:30pm, LP-F3E: Linked open data (Location: MCG-E)
 - Data narratives with Linked Open Data, the case of mythLOD storytelling
 - Linking (In)Completeness: A Collaborative Approach to Representing People in Art Provenance Data
 - “The research is happening in the text fields” – Are Linked Open Data and Art History a good match?

Outlook: The LOD paradigm for the humanities – Wikibase & Wikidata



Further Wikibase-Instances for the humanities

- [Enslaved.org](https://enlaved.org/)
- [ArtBase](https://artbase.org/)
- [FactGrid](https://factgrid.org/)

Projects that use Wikidata, contribute or map data

- [Tracking Looted Art with Graphs: A Case Study](#) (Zuckerman 2022)
- [DraCor](#) (Fischer et al. 2019)
- [ELTeC](#) (Nešić et al. 2021)
- [WeChangEd](#) (Thornton et. al. 2021)
- cf. Zhao 2022

Outlook: The LOD paradigm for the humanities – Wikibase & Wikidata: Study by Zhao (2022)

Wikidata is seen in DH projects as:

- Database
- Knowledge Base / Knowledge Graph
- Linked Open Data in the Semantic Web
- Ontology
- Authority data set / Controlled vocabulary

In DH projects, Wikidata is used as:

- Content provider
- Platform
 - for the dissemination of data
 - for linking data
 - as access to data sets from other external sources
- Technology Stack for Linked Data Publication
(RDF Dumps; Live-SPARQL-endpoint, language-neutral URIs; Wikibase)



Outlook: The LOD paradigm for the humanities – Wikibase & Wikidata: Study by Zhao (2022)

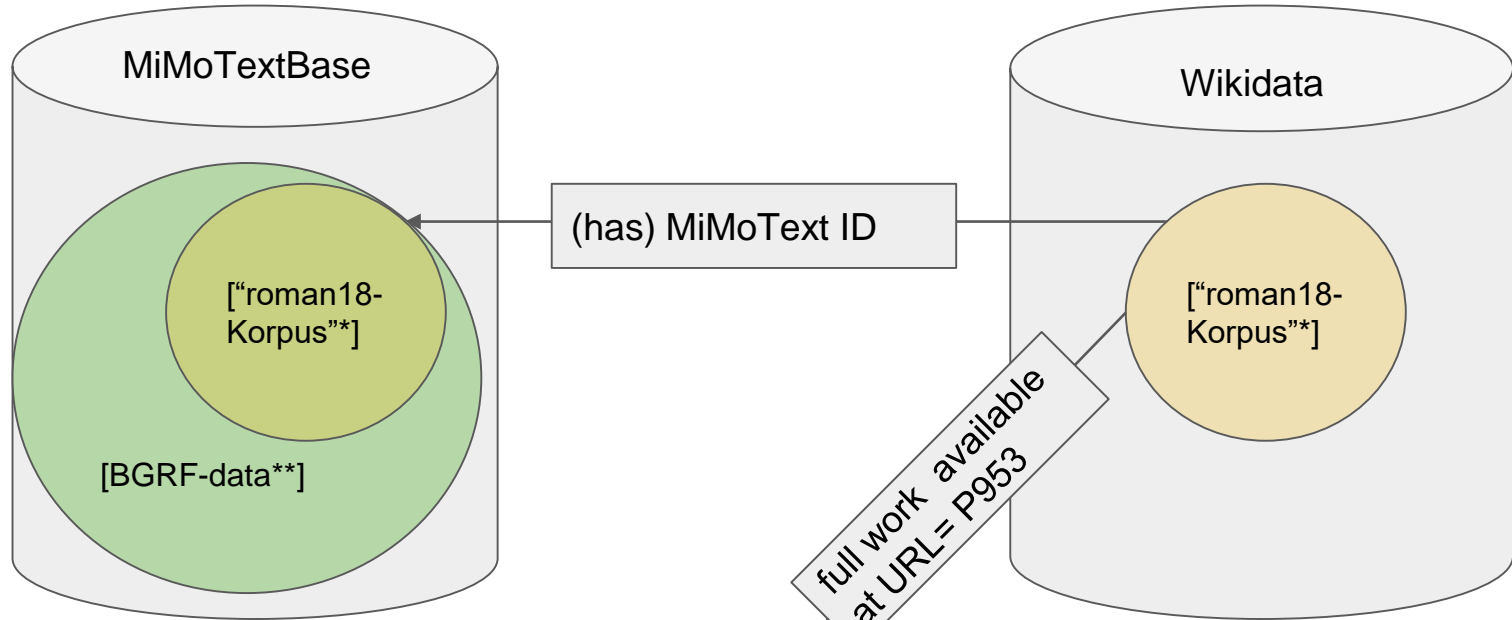
Main applications of Wikidata in DH projects:

- Annotations
- Data enrichment
- Metadata curation
- Modeling
- Named Entity Recognition (NER)

So far, only a few DH projects publish their data on Wikidata!



Outlook: Future work



*see: Spring Release 2023 = **205 full texts (french enlightenment novels)**

<https://zenodo.org/record/7712928> +
<https://github.com/MiMoText/roman18>

** BGRF = Bibliographie du genre romanesque français
1751-1800 = about **1700 texts** (cf. Martin et al. 1977)

Large Language Models and Knowledge Graphs



ChatGPT (LLMs) vs. Knowledge Graphs

Posted on March 24, 2023 by Kurt Cagle

AI's Woolf at the door — LLMs and Knowledge Graphs

Dean Allemang · Follow
8 min read · May 15

115 5

I was at the [Knowledge Graph Conference](#) this week, and as usual, it was a fun and insightful time. I have enough topics for at least four blog posts. I'm going to start working through them.

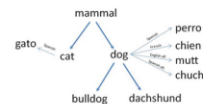
This first one is about a topic that seemed to be on just about every mind, whether the recent explosion of interest in AI and LLMs was finally the turning point that would put Knowledge Graphs on the map because, as some have said, and many at the conference were discussing, Knowledge Graphs and LLMs are “a match made in Heaven”.

Getting ChatGPT to turn a flat vocabulary list into a hierarchical taxonomy

ChatGPT-3. Chat GPT-4.

I was catching up with my old friend [Paul Prescod](#) the other day. We have not only known each other since the early days of XML, but actually before that: “since XML was a [four-letter word](#)”, to quote Paul.

One current popular topic we discussed is where LLM tools such as ChatGPT can add value in the data pipelines that we have worked with. We've all seen blog posts where people got ChatGPT to create code in their favorite languages; Paul and I, as always, were focused on how it could improve content and content metadata. I've often said that the point of metadata is to add value to content, so automating the creation of useful metadata is automating the addition of value to content.



MAY 20, 2023

(Kagle 2023, Allemang 2003, DuCharme 2023)

Outlook: Using ChatGPT to write SPARQL-Queries

Can ChatGPT solve the exercise from Part 2?

Prompt 1: Write a SPARQL query to find all composers born in the 17th century on wikidata.



Certainly! Here's a SPARQL query to find all composers born in the 17th century on Wikidata:

```
sparql Copy code
SELECT ?composer ?composerLabel ?birthDate
WHERE {
  ?composer wdt:P31 wd:Q5; # Instance of human
           wdt:P106 wd:Q36834; # Occupation composer
           wdt:P569 ?birthDate. # Birth date property

  FILTER(YEAR(?birthDate) >= 1600 && YEAR(?birthDate) <= 1699)

  SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]"
}
ORDER BY ?birthDate
```

This query selects the `composer`, `composerLabel`, and `birthDate` variables for all entities that have the occupation `composer` and were born in the 17th century. The `FILTER` clause restricts the birth date range from 1600 to 1699. The `SERVICE` clause is used to retrieve labels in English.

Please note that executing this query may take some time due to the large amount of data in Wikidata.

Query:
[https://w.wiki/6yW\\$](https://w.wiki/6yW$)

Outlook: Using ChatGPT to write SPARQL-Queries

Can ChatGPT solve the exercise from Part 2?

Prompt 2: also retrieve the places of birth, and then sort the result in ascending order based on the dates of birth.



Certainly! Here's an updated SPARQL query that includes the places of birth and sorts the result in ascending order based on the dates of birth:

```
sparql Copy code
SELECT ?composer ?composerLabel ?birthDate ?placeOfBirthLabel
WHERE {
  ?composer wdt:P31 wd:Q5; # Instance of human
            wdt:P106 wd:Q36834; # Occupation composer
            wdt:P569 ?birthDate; # Birth date property
            wdt:P19 ?placeOfBirth. # Place of birth property

  FILTER(YEAR(?birthDate) >= 1600 && YEAR(?birthDate) <= 1699)

  SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]" }
}
ORDER BY ?birthDate
```

In this query, I added the `?placeOfBirthLabel` variable to retrieve the label of the place of birth. The `wdt:P19 ?placeOfBirth` statement connects the composer to their place of birth. The `ORDER BY ?birthDate` clause is used to sort the result in ascending order based on the birth dates.

Please note that executing this query may still take some time due to the large amount of data in Wikidata.

Query:

<https://w.wiki/6yX7>

Problem here: you will get less results because not all composers who found in the previous step have a placeOfBirth on Wikidata. Better with OPTIONAL, but ChatGPT didn't do that.

Outlook: Using ChatGPT to write SPARQL-Queries

Can ChatGPT solve the exercise from Part 2?

Prompt 3: Finally, please display the result on a timeline.

 To display the result on a timeline, you would typically use a visualization tool or library that supports timeline visualization, such as TimelineJS or Google Charts. Below is an example of how you can modify the SPARQL query to retrieve the required data for a timeline visualization:

```
sparql Copy code
SELECT ?composer ?composerLabel ?birthDate ?placeOfBirthLabel
WHERE {
  ?composer wdt:P31 wd:Q5; # Instance of human
            wdt:P106 wd:Q36834; # Occupation composer
            wdt:P569 ?birthDate; # Birth date property
            wdt:P19 ?placeOfBirth. # Place of birth property

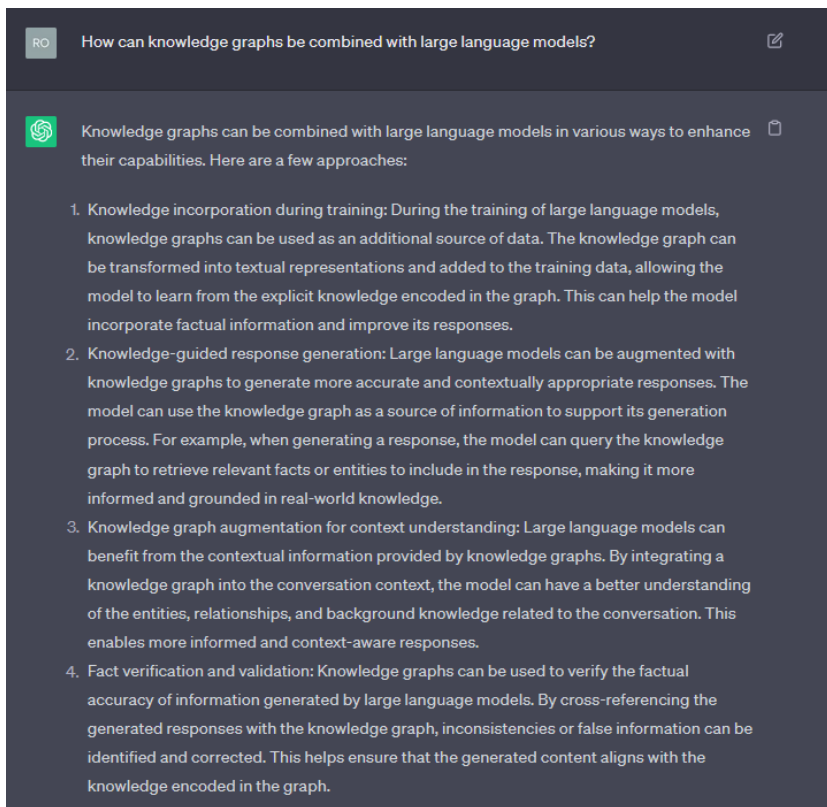
  FILTER(YEAR(?birthDate) >= 1600 && YEAR(?birthDate) <= 1699)


  SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]" }
}
ORDER BY ?birthDate
```



Once you have retrieved the data, you can use the timeline visualization tool/library of your choice to display the result. You would typically provide the data in a specific format expected by the tool/library. Please refer to the documentation of the tool/library you are using for instructions on how to format and visualize the data as a timeline.

Problem here: instead of using the built-in #defaultView, ChatGPT suggests 3rd party frameworks, which is not wrong but not what we wanted

Outlook: an integration of knowledge graphs and LLMs?



RO How can knowledge graphs be combined with large language models? 

 Knowledge graphs can be combined with large language models in various ways to enhance their capabilities. Here are a few approaches: 

1. **Knowledge incorporation during training:** During the training of large language models, knowledge graphs can be used as an additional source of data. The knowledge graph can be transformed into textual representations and added to the training data, allowing the model to learn from the explicit knowledge encoded in the graph. This can help the model incorporate factual information and improve its responses.
2. **Knowledge-guided response generation:** Large language models can be augmented with knowledge graphs to generate more accurate and contextually appropriate responses. The model can use the knowledge graph as a source of information to support its generation process. For example, when generating a response, the model can query the knowledge graph to retrieve relevant facts or entities to include in the response, making it more informed and grounded in real-world knowledge.
3. **Knowledge graph augmentation for context understanding:** Large language models can benefit from the contextual information provided by knowledge graphs. By integrating a knowledge graph into the conversation context, the model can have a better understanding of the entities, relationships, and background knowledge related to the conversation. This enables more informed and context-aware responses.
4. **Fact verification and validation:** Knowledge graphs can be used to verify the factual accuracy of information generated by large language models. By cross-referencing the generated responses with the knowledge graph, inconsistencies or false information can be identified and corrected. This helps ensure that the generated content aligns with the knowledge encoded in the graph.

Discussion Semantic Web & LOD & LLMs

- What does the emergence and evolution of LLMs mean for Knowledge Graphs?
- What role can / should formal semantics play in the context of Linked Open Data and Semantic Web?
- What can / should be solved in a project-specific way? To what extent are cross-project, community-based standards important / possible? How could these be developed?

Discussion Knowledge Graphs & LLMs

	Knowledge Graph	LLMs
representation of knowledge	<ul style="list-style-type: none">• knowing / “telling” (Allemang 2023)• explicit representation of entities and their relations	<ul style="list-style-type: none">• “figuring out” (Allemang 2023)• generating human-like text based on statistical patterns
data	<ul style="list-style-type: none">• created through structured information extraction and data integration	<ul style="list-style-type: none">• massive amounts of language data
reasoning and inference	<ul style="list-style-type: none">• logical deductions, inferring new information based on existing knowledge	<ul style="list-style-type: none">• reasoning based on learned patterns• hallucinations possible (as of July 2023)
updates & actuality	<ul style="list-style-type: none">• incrementally updates possible	<ul style="list-style-type: none">• periodic updates• may lead to outdated information (as of July 2023)
training & (ecological) effects	<ul style="list-style-type: none">• retraining not required	<ul style="list-style-type: none">• High resource consumption and ecological footprint

Discussion: Fields of tension in the 'Wikiverse'

Potentials & Opportunities

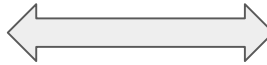
Limits & Obstacles

Wikidata as “linking hub”
(cf. Neubert 2017),



Lack of systematic ontology and formal semantics (cf. Sack 2022)

Benefit already through linking at entity level (instance data)



Potential only with (high) semantic expressivity

Representation of multilingualism as an ideal; Vision Abstract Wikipedia (Vrandečić 2021)



Biases and dominances in reality; language specificity of concepts (controlled vocabularies)

Knowledge representation community-based; participation opportunities



Inequality and injustice in knowledge representation; selection processes

relative transparency in data generation



Data becomes 'independent' through multiple uses, no control

Discussion: Fields of tension in the 'Wikiverse'

Potentials & Opportunities

formalized, standardized
representation of knowledge



Limits & Obstacles

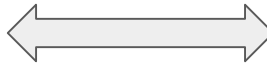
Project specificity and time limits complicate
standardization processes (cf.
<https://lov.linkeddata.es/dataset/lov/>))

Overcoming data silos and avoiding
redundancy



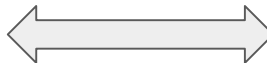
Infrastructure dependency of data models (e.g.
in modeling of 'reification')

Bridging function: LOD can be
generated and analyzed by quantitative
or qualitative methods



Data quality, effort in data generation (manual
corrections of reconciliation etc.)

Change in publishing (cf. "[Open Access
für die Maschinen](#)", Schöch 2021)

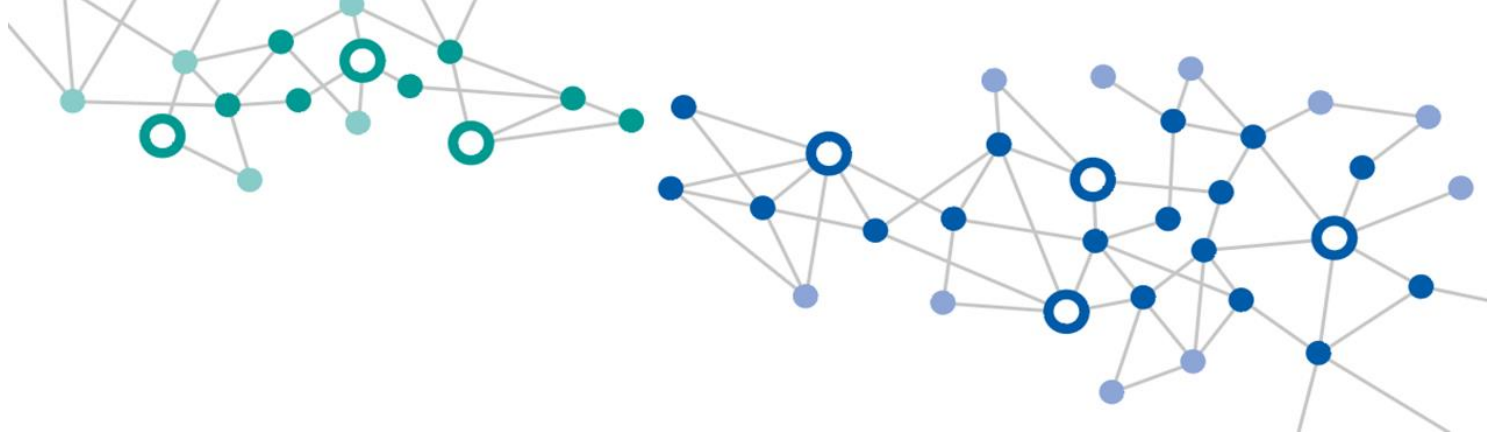


Acceptance hurdles, resource requirements

Further resources (tutorials)

- [Wikidata SPARQL Tutorial](#)
- [Wikidata:SPARQL queries examples](#)
- [Wikidata Query Service Tutorial](#) by Wikimedia Israel
- Bob du Charme's book (DuCharme 2013) and his [blog](#)

https://mimotext.github.io/MiMoTextBase_Tutorial/faq.html#other_tutorials



Thank you!

References

- Abel, Antoine. 2019. "Faster SPARQL Federated Queries." Other, Université Rennes1. <https://hal.inria.fr/hal-02269417>.
- AnHai Doan, Alon Halevy, and Zachary Ives. 2012. "8 - Query Processing." In *Principles of Data Integration*, 209–41. Elsevier Inc. <https://doi.org/10.1016/B978-0-12-416044-6.00008-9>.
- Brown, Susan. 2022. "Same Difference: Identity and Diversity in Linked Open Cultural Data." *International Journal of Humanities and Arts Computing* 16 (1): 1–16. <https://doi.org/10.3366/ijhac.2022.0273>.
- Dengel, Andreas. 2012. *Semantische Technologien: Grundlagen. Konzepte. Anwendungen*. Heidelberg: Spektrum.
- DuCharme, Bob. 2013. *Learning SPARQL*. Sebastopol, United States: O'Reilly Media. <http://ebookcentral.proquest.com/lib/uni-trier/detail.action?docID=1250020>.
- . 2022. "Queries to Explore a Dataset - Even a Schemaless One." *Bob DuCharme's Weblog, Mostly on Technology for Representing and Linking Information*. (blog). April 30, 2022. <https://www.bobdc.com/blog/exploringadataset/>.
- Ehrlinger, Lisa, and Wolfram Wöß. 2016. "Towards a Definition of Knowledge Graphs." In . Leipzig. <http://ceur-ws.org/Vol-1695/paper4.pdf>.
- Evans, Navino. 2016. *Wikidata Sparql Query Tutorial*. https://www.youtube.com/watch?v=1jHoUkj_mKw.
- Feigenbaum, Lee. 2009. "SPARQL By Example - A Tutorial." June 9, 2009. <https://www.w3.org/2009/Talks/0615-qbe/>.
- Fischer, Frank, Börner, Ingo, Göbel, Mathias, Hecht, Angelika, Kittel, Christopher, Milling, Carsten, and Trilcke, Peer. 2019. "Programmable Corpora: Introducing DraCor, an Infrastructure for the Research on European Drama," July. <https://doi.org/10.5281/ZENODO.4284002>.
- Hinzmann, Maria, Anne Klee, Johanna Konstanciak, Julia Röttgermann, Christof Schöch, and Moritz Steffes. 2022. "MiMoTextBase Tutorial." July 2022. https://mimotox.github.io/MiMoTextBase_Tutorial/.
- . 2023. "SPARQL Für (Digitale) Geisteswissenschaftler:Innen – Querying Wikidata Und Die MiMoTextBase." Trier, Luxemburg, March 10. <https://doi.org/10.5281/zenodo.7715355>.
- Hitzler, P., M. Krötzsch, and S. Rudolph. 2009. "Foundations of Semantic Web Technologies." In . <https://doi.org/10.1201/9781420090512>.
- Hitzler, Pascal, Markus Krötzsch, and Sebastian Rudolph. 2010. "Chapter 7 - Query Languages." In *Foundations of Semantic Web Technologies*. Chapman & Hall/CRC Textbooks in Computing. Boca Raton: CRC Press.
- Hogan, Aidan. 2022. *Knowledge Graphs*. Synthesis Lectures on Data, Semantics and Knowledge 22. San Rafael: Morgan & Claypool Publishers.
- Hooland, Seth van, and Ruben Verborgh. 2014. *Linked Data for Libraries, Archives and Museums: How to Clean, Link and Publish Your Metadata*. London: Facet Publishing. <http://ebookcentral.proquest.com/lib/uni-trier/detail.action?docID=1993231>.
- Huynh, David. (2012) 2010. *OpenRefine*. Java. OpenRefine. <https://github.com/OpenRefine/OpenRefine>.
- Hyland-Wood, Bernadette, and David Hyland-Wood. 2011. "The Joy of Data - A Cookbook for Publishing Linked Government Data on the Web." In , 3–26. https://doi.org/10.1007/978-1-4614-1767-5_1.
- Ikončić Nešić, Milica, Ranka Stanković, and Biljana Rujević. 2021. "Serbian ELTeC Sub-Collection in Wikidata." *Infotheca* 21 (2): 60–86. <https://doi.org/10.18485/infotheca.2021.21.2.4>.

References

- Lassila, Ora, and Ralph R. Swick. 1999. "Resource Description Framework (RDF) Model and Syntax Specification." February 22, 1999. <https://www.w3.org/TR/1999/REC-rdf-syntax-19990222/>.
- Lincoln, Matthew. 2015. "Using SPARQL to Access Linked Open Data." Edited by Fred Gibbs. *The Programming Historian*, no. 4 (November). <https://doi.org/10.46430/phen0047>.
- Martin, Angus, Vivienne Mylne, and Richard L. Frautschi. 1977. *Bibliographie du genre romanesque français, 1751-1800*. London: Mansell.
- Mora-Cantalops, Marçal, Salvador Sánchez-Alonso, and Elena García-Barriocanal. 2019. "A Systematic Literature Review on Wikidata." *Data Technologies and Applications* 53 (3): 250–68. <https://doi.org/10.1108/DTA-12-2018-0110>.
- Neubert, Joachim. 2017. "Wikidata as a Linking Hub for Knowledge Organization Systems? Integrating an Authority Mapping into Wikidata and Learning Lessons for KOS Mappings." In *Proceedings of the 17th European NKOS Workshop*. <http://ceur-ws.org/Vol-1937/paper2.pdf>.
- Prud'hommeaux, Eric, and Carlos Buil-Aranda. 2013. "SPARQL 1.1 Federated Query." W3C Recommendation. March 21, 2013. <https://www.w3.org/TR/sparql11-federated-query/>.
- Sack, Harald. 2022. "Nfdi4Culture: Knowledge Graphs (and Wikibase) for Research Data Management." Presented at the NFDI InfraTalks | online, March 7. <https://raw.githubusercontent.com/lysander07/Presentations/main/2022-03-07-KnowledgeGraphs%40nfdi4Culture.pdf>.
- Sack, Harald, and Mehwish Alam. 2020. "Knowledge Graphs." OpenHPI. 2020. <https://open.hpi.de/courses/knowledgegraphs2020>.
- Sack, Harald, and Maria Koutraki. n.d. "Information Service Engineering: 4. Linked Data Engineering II – 4.4 How to Query RDF with SPARQL." OpenHPI. Accessed January 20, 2023. <https://open.hpi.de/courses/semanticweb2017/items/44Waz06Vlm9T4LZSwl8I3m>.
- Schöch, Christof. 2021. "Open Access Für Die Maschinen." In *Die Zukunft Des Kunsthistorischen Publizierens*, edited by Maria Effinger and Hubertus Kohle, 79–94. arthistoricum.net. <https://doi.org/10.11588/ARTHISTORICUM.663>.
- Singhal, Amit. 2012. "Introducing the Knowledge Graph: Things, Not Strings." Google (blog). May 16, 2012. <https://blog.google/products/search/introducing-knowledge-graph-things-not/>.
- Vrandečić, Denny. 2021. "Building a Multilingual Wikipedia." *Communications of the ACM* 64 (4): 38–41. <https://doi.org/10.1145/3425778>.
- Wikidata-Autor:innen. n.d. "Wikidata:SPARQL Tutorial - Wikidata." Accessed May 30, 2022. https://www.wikidata.org/wiki/Wikidata:SPARQL_tutorial.
- Wikimedia Foundation. 2016. *SPARQL Workshop*. <https://www.youtube.com/watch?v=NaMdh4fXy18>.
- Wikimedia Israel. 2020. "Wikidata Query Service Tutorial." 2020. <https://wdqs-tutorial.toolforge.org/>.
- Zhao, Fudie. 2022. "A Systematic Review of Wikidata in Digital Humanities Projects." *Digital Scholarship in the Humanities*, December, fqac083. <https://doi.org/10.1093/llc/fqac083>.
- Zuckerman, Laurel. 2022. "Tracking Looted Art with Graphs." *Extended Abstract: Graphs and Networks in the Humanities 2022 Conference*, February. https://www.academia.edu/70298130/Tracking_Looted_Art_with_Graphs_extended_abstract_Graphs_and_Networks_in_the_Humanities_2022_Conference_February_3_4_2022.