



# Exploring cultural data from UNESCO using semantic technologies: Predefined local queries

María Auxilio Medina Nieto<sup>1</sup>, Gudelia Pilar Pérez Conde<sup>2</sup>

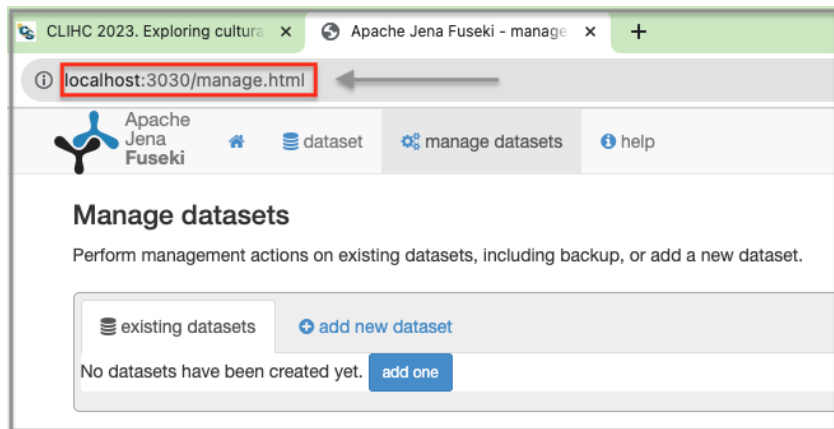
Universidad Politécnica de Puebla

<sup>1</sup>Departamento de Posgrado

<sup>2</sup>Ingeniería en Tecnologías de la Información

October 30th 2023

# 1. Start the server



CLIHC 2023. Exploring cultura x Apache Jena Fuseki - manage x +

localhost:3030/manage.html

Apache Jena Fuseki

dataset manage datasets help

## Manage datasets

Perform management actions on existing datasets, including backup, or add a new dataset.

existing datasets + add new dataset

No datasets have been created yet. [add one](#)

## 2. Add the data

localhost:3030/manage.html

Apache Jena Fuseki

dataset manage datasets help

Server status: ●

### Manage datasets

Perform management actions on existing datasets, including backup, or add a new dataset.

existing datasets + add new dataset

**Dataset name**

**Dataset type**

- In-memory – dataset will be recreated when Fuseki restarts, but contents will be lost
- Persistent – dataset will persist across Fuseki restarts
- Persistent (TDB2) – dataset will persist across Fuseki restarts

### 3. Create a dataset

Apache Jena Fuseki

dataset manage datasets help

Server status: ●

## Manage datasets

Perform management actions on existing datasets, including backup, or add a new dataset.

existing datasets [+ add new dataset](#) ← 1

**Name**

<span style="border: 1px solid red; padding: 2px;">/UNESCOdata</span> ← 2	<a href="#">remove</a>	<a href="#">backup</a>	<a href="#">upload data</a>
---	------------------------	------------------------	-----------------------------

## 4. Select the files

[query](#) [upload files](#) [edit](#) [info](#)

### Upload files

Load data into the default graph of the currently selected dataset, or the given named graph. You may upload any RDF format, such as Turtle, RDF/XML or TRIG.

**Destination graph name**

**Files to upload** [+ select files...](#) [upload all](#)

countries.ttl	30.2kb	<a href="#">upload now</a>	<a href="#">remove</a>
dataNational.ttl	113.0kb	<a href="#">upload now</a>	<a href="#">remove</a>
labels.ttl	2.2kb	<a href="#">upload now</a>	<a href="#">remove</a>
metadata.ttl	197.1kb	<a href="#">upload now</a>	<a href="#">remove</a>

# 5. Upload of files

Apache Jena Fuseki

Server status: ●

Dataset: /UNESCOdata

query upload files edit info

### Upload files

Load data into the default graph of the currently selected dataset, or the given named graph. You may upload any RDF format, such as Turtle, RDF/XML or TRIG.

Destination graph name:

Files to upload:

countries.ttl	30.2kb
Result: <b>success.</b> 482 triples	
<div style="background-color: #4CAF50; height: 15px; width: 100%;"></div>	
dataNational.ttl	113.0kb
Result: <b>success.</b> 2132 triples	
<div style="background-color: #4CAF50; height: 15px; width: 100%;"></div>	
labels.ttl	2.2kb
Result: <b>success.</b> 16 triples	
<div style="background-color: #4CAF50; height: 15px; width: 100%;"></div>	
metadata.ttl	197.1kb
Result: <b>success.</b> 3160 triples	
<div style="background-color: #4CAF50; height: 15px; width: 100%;"></div>	

# Types of content

The screenshot shows the Apache Jena Fuseki web interface. At the top left is the Apache Jena Fuseki logo. The navigation bar includes 'dataset', 'manage datasets', and 'help'. The server status is shown as 'Server status: [green dot]'. The main content area is for the dataset '/UNESCOdata'. It features a 'query' tab, 'upload files', 'edit', and 'info' buttons. Below these are 'EXAMPLE QUERIES' (Selection of triples, Selection of classes) and 'PREFIXES' (rdf, rdfs, owl, xsd, +). A red box highlights the configuration section at the bottom, which includes a 'SPARQL ENDPOINT' field with the value '/UNESCOdata/sparql', a 'CONTENT TYPE (SELECT)' dropdown menu set to 'JSON', and a 'CONTENT TYPE (GRAPH)' dropdown menu set to 'Turtle'.

Apache Jena Fuseki

dataset manage datasets help

Server status: [green dot]

Dataset: /UNESCOdata

query upload files edit info

### SPARQL query

To try out some SPARQL queries against the selected dataset, enter your query here.

EXAMPLE QUERIES

Selection of triples Selection of classes

PREFIXES

rdf rdfs owl xsd +

SPARQL ENDPOINT: /UNESCOdata/sparql

CONTENT TYPE (SELECT): JSON

CONTENT TYPE (GRAPH): Turtle

# Writing SPARQL queries: retrieving 3 triplets

```
1 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2 PREFIX owl: <http://www.w3.org/2002/07/owl#>
3 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
4
5 SELECT ?s ?p ?o
6 WHERE
7 {
8     ?s ?p ?o .
9 }
10 LIMIT 3
```

QUERY RESULTS

Table Raw Response

Showing 1 to 3 of 3 entries Search:  Show 50 entries

	s	p	o
1	<http://localhost:3333/225>	<http://localhost:3333/METADAT A>	"Includes cultural heritage only"
2	<http://localhost:3333/225>	<http://localhost:3333/YEAR>	"2017"
3	<http://localhost:3333/225>	<http://localhost:3333/YEAR>	"2021"

Showing 1 to 3 of 3 entries



# Number of triplets

```
1 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2 PREFIX owl: <http://www.w3.org/2002/07/owl#>
3 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
4
5 SELECT (COUNT(*) AS ?numberOfTriplets)
6 WHERE
7 {
8     ?s ?p ?o .
9 }
```

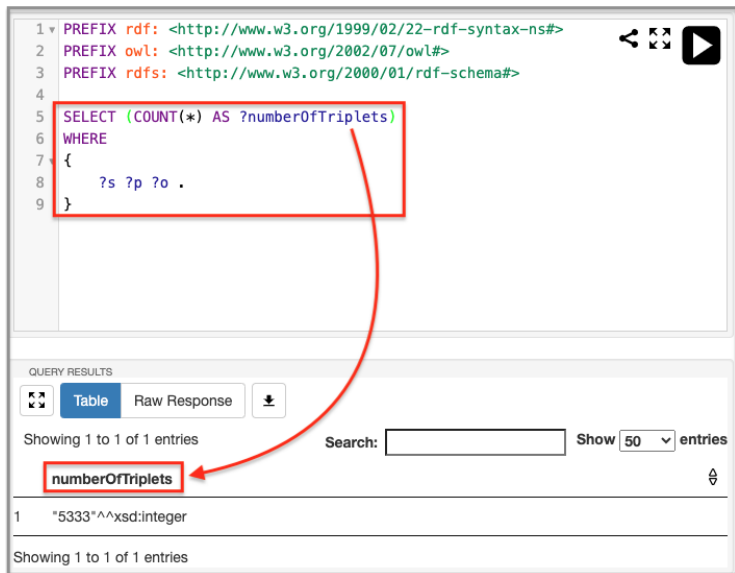
QUERY RESULTS

Table Raw Response

Showing 1 to 1 of 1 entries Search:  Show 50 entries

	numberOfTriplets
1	"5333"^^xsd:integer

Showing 1 to 1 of 1 entries






# Query to retrieve the distinct predicates

```
1 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2 PREFIX owl: <http://www.w3.org/2002/07/owl#>
3 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
4
5 SELECT DISTINCT ?p
6 WHERE
7 {
8     ?s ?p ?o.
9 }
10 ORDER BY ?p
```




# Result of distinct predicates

QUERY RESULTS

 **Table**  

Showing 1 to 10 of 10 entries Search:  Show  entries

**p** 

---

1	<a href="http://localhost:3333/COUNTRY_ID">http://localhost:3333/COUNTRY_ID</a>
2	<a href="http://localhost:3333/COUNTRY_NAME_EN">http://localhost:3333/COUNTRY_NAME_EN</a>
3	<a href="http://localhost:3333/INDICATOR_ID">http://localhost:3333/INDICATOR_ID</a>
4	<a href="http://localhost:3333/INDICATOR_LABEL_EN">http://localhost:3333/INDICATOR_LABEL_EN</a>
5	<a href="http://localhost:3333/MAGNITUDE">http://localhost:3333/MAGNITUDE</a>
6	<a href="http://localhost:3333/METADATA">http://localhost:3333/METADATA</a>
7	<a href="http://localhost:3333/QUALIFIER">http://localhost:3333/QUALIFIER</a>
8	<a href="http://localhost:3333/TYPE">http://localhost:3333/TYPE</a>
9	<a href="http://localhost:3333/VALUE">http://localhost:3333/VALUE</a>
10	<a href="http://localhost:3333/YEAR">http://localhost:3333/YEAR</a>

---

Showing 1 to 10 of 10 entries

# Cultural indicators in CSV format

SDG11_LABEL	
INDICATOR_ID	INDICATOR_LABEL_EN
HEXPCSTPPPCAP.CULHER	Total expenditure (public and private) per capita spent on cultural heritage (constant PPP\$ - 2017)
HEXPCSTPPPCAP.HER	Total expenditure per capita spent on the preservation, protection and conservation of all cultural and natural heritage (constant PPP\$ - 2017)
HEXPCSTPPPCAP.HER.PR	Total private expenditure per capita spent on cultural and natural heritage (constant PPP\$ - 2017)
HEXPCSTPPPCAP.HER.PU	Total public expenditure per capita spent on cultural and natural heritage (constant PPP\$ - 2017)
HEXPCSTPPPCAP.NATHER	Total expenditure (public and private) per capita spent on natural heritage (constant PPP\$ - 2017)
HEXPCSTPPPCAPGOV.LOC.HER.PU	Total public expenditure per capita at local/municipal level on cultural and natural heritage (constant PPP\$ - 2017)
HEXPCSTPPPCAPGOV.NTL.HER.PU	Total public expenditure per capita at national/federal level on cultural and natural heritage (constant PPP\$ - 2017)
HEXPCSTPPPCAPGOV.REG.HER.PU	Total public expenditure per capita at regional level on cultural and natural heritage (constant PPP\$ - 2017)



# Query to retrieve the indicators

```
1 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2 PREFIX owl: <http://www.w3.org/2002/07/owl#>
3 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
4
5 SELECT DISTINCT ?s ?o
6 WHERE
7 {
8   ?s <http://localhost:3333/INDICATOR_LABEL_EN> ?o.
9 }
10 ORDER BY ?s
```



# List of indicators

QUERY RESULTS

 **Table** Raw Response 

Showing 1 to 8 of 8 entries

Search:  Show  entries

s	o
1	<a href="http://localhost:3333/0">&lt;http://localhost:3333/0&gt;</a> "Total expenditure (public and private) per capita spent on cultural heritage (constant PPP\$ - 2017)"
2	<a href="http://localhost:3333/1">&lt;http://localhost:3333/1&gt;</a> "Total expenditure per capita spent on the preservation, protection and conservation of all cultural and natural heritage (constant PPP\$ - 2017)"
3	<a href="http://localhost:3333/2">&lt;http://localhost:3333/2&gt;</a> "Total private expenditure per capita spent on cultural and natural heritage (constant PPP\$ - 2017)"
4	<a href="http://localhost:3333/3">&lt;http://localhost:3333/3&gt;</a> "Total public expenditure per capita spent on cultural and natural heritage (constant PPP\$ - 2017)"

# List of indicators in JSON format

```
QUERY RESULTS
Table Raw Response
1 {
2   "head": {
3     "vars": [ "s" , "o" ]
4   } ,
5   "results": {
6     "bindings": [
7       {
8         "s": { "type": "uri" , "value": "http://localhost:3333/0" } ,
9         "o": { "type": "literal" , "value": "Total expenditure (public
and private) per capita spent on cultural heritage (constant PPP$ -
10 2017)" }
11       } ,
12       {
13         "s": { "type": "uri" , "value": "http://localhost:3333/1" } ,
14         "o": { "type": "literal" , "value": "Total expenditure per capita
spent on the preservation, protection and conservation of all cultural
and natural heritage (constant PPP$ - 2017)" }
15       }
16     ]
17   }
18 }
```

# Country ID for Mexico

```
1 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2 PREFIX owl: <http://www.w3.org/2002/07/owl#>
3 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
4
5 SELECT DISTINCT ?s
6 WHERE
7 {
8   ?s <http://localhost:3333/COUNTRY_NAME_EN> "Mexico" .
9 }
10 ORDER BY ?s
```

QUERY RESULTS

Table Raw Response

Showing 1 to 1 of 1 entries Search:  Show 50 entries

s
---

---

1 <http://localhost:3333/129>



Thanks a lot! 😊



María Auxilio Medina Nieto

Departamento de Posgrado

maria.medina@uppuebla.edu.mx, mauxmedina@gmail.com

Gudelia Pilar Pérez Conde

Ingeniería en Tecnologías de la Información

gudelia.perez353@uppuebla.edu.mx

