

TALOS ERA CHAIR IN ARTIFICIAL INTELLIGENCE FOR HUMANITIES AND SOCIAL SCIENCES



ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
UNIVERSITY OF CRETE



“SPARQL”

Rafail Giannadakis

Research Assistant, TALOS-AI4SSH

giannadakis.uni@gmail.com

<https://talos-ai4ssh.uoc.gr/>



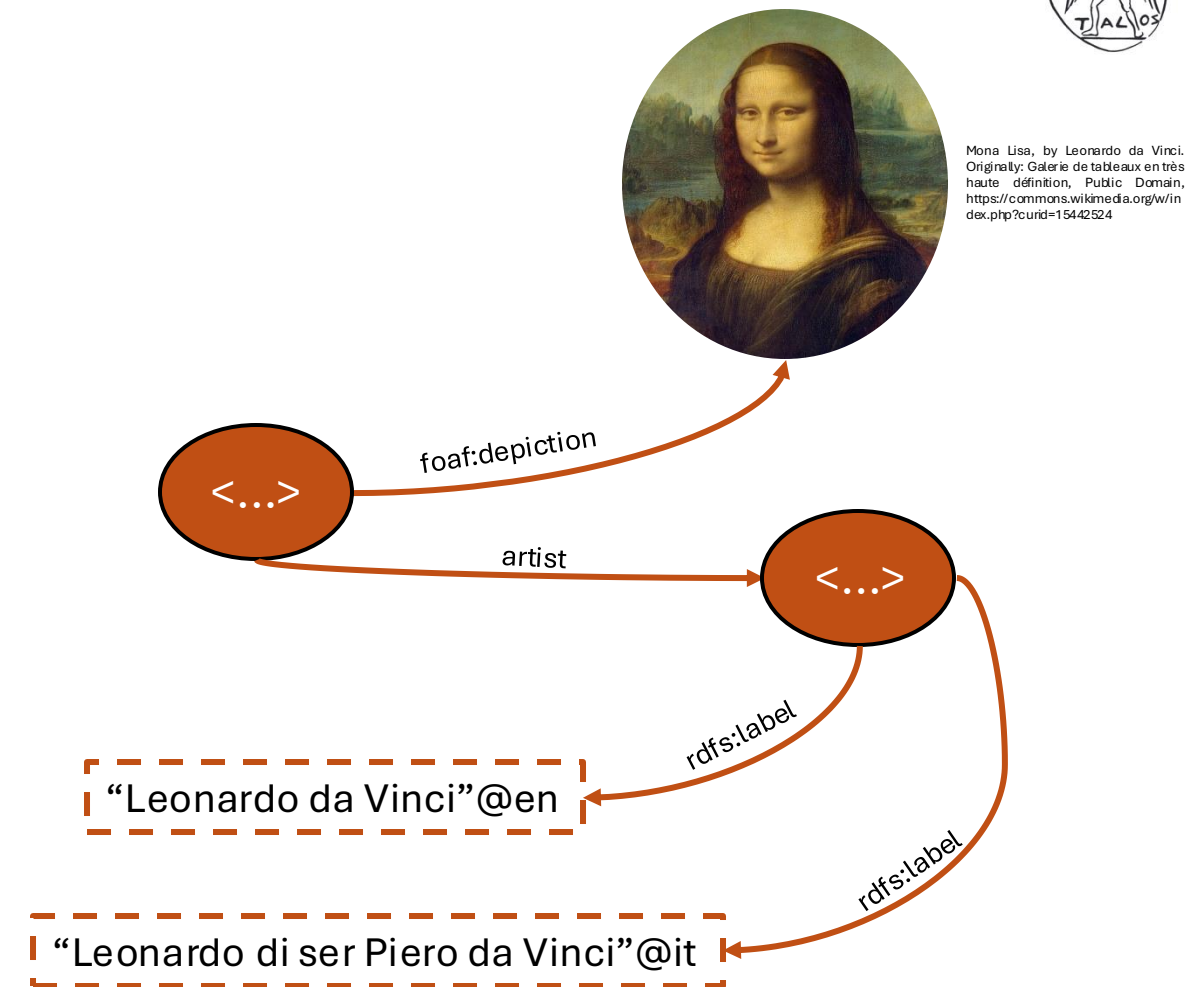
Horizon ERA Chair TALOS AI4SSH Project funded by the European Commission
Grant Agreement n° 101087269, <https://cordis.europa.eu/project/id/101087269>



Funded by the
European Union

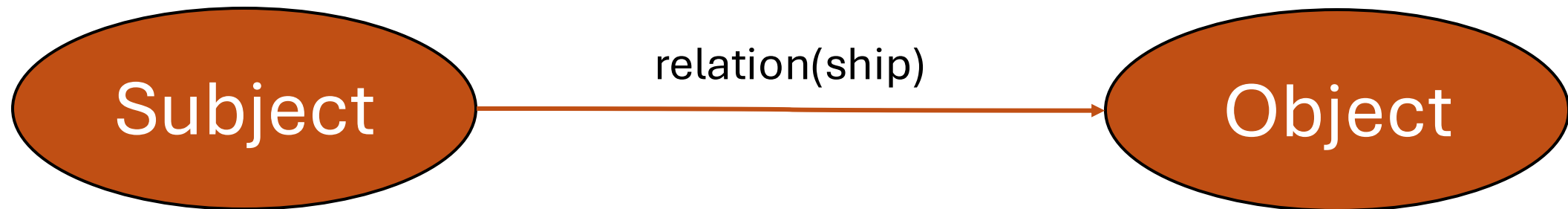
Contents

- Recap of RDF
- What is SPARQL?
 - Query Graph Structure
 - Breakdown of SPARQL Queries
 - Executing SPARQL Queries
- Conclusion



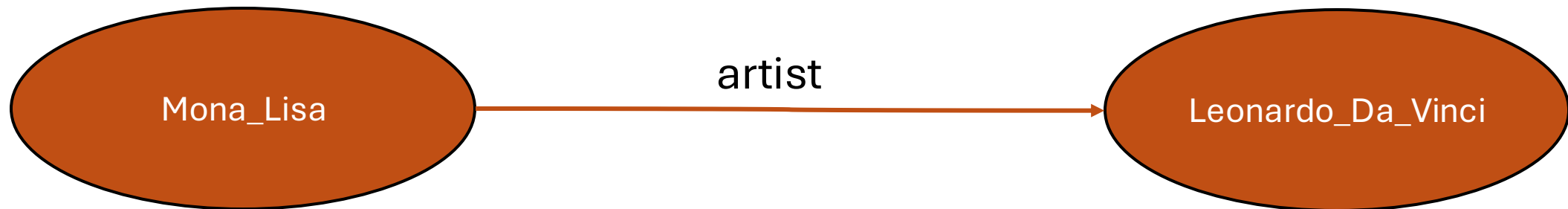
Recap of RDF

- RDF graphs=> represent web information
- Directed and labelled graphs
- Triples



Recap of RDF

- RDF graphs=> represent web information
- Directed and labelled graphs
- Triples



What is SPARQL?

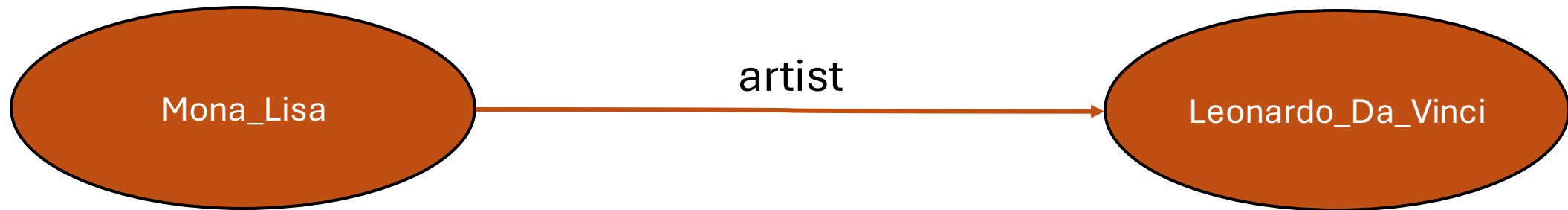
- SPARQL Protocol and RDF Query Language
- Query and retrieve data stored or viewed in RDF format.
- “Trying to use the Semantic Web without SPARQL is like trying to use a relational database without SQL”.

Tim Berners-Lee

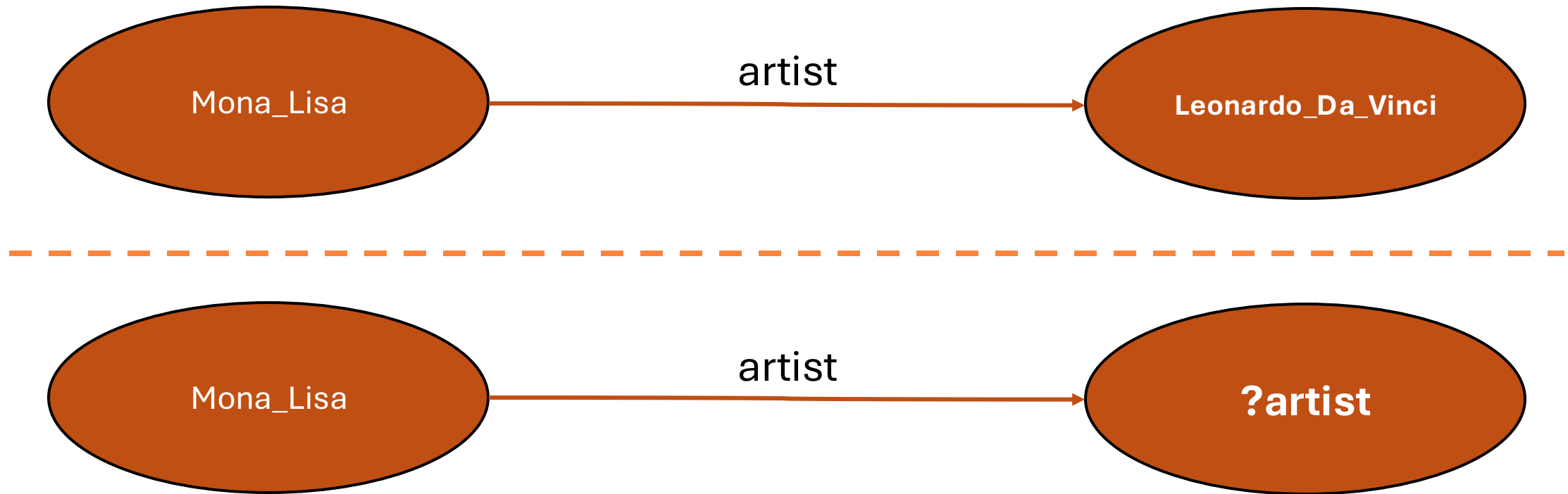


Query Graph Structure

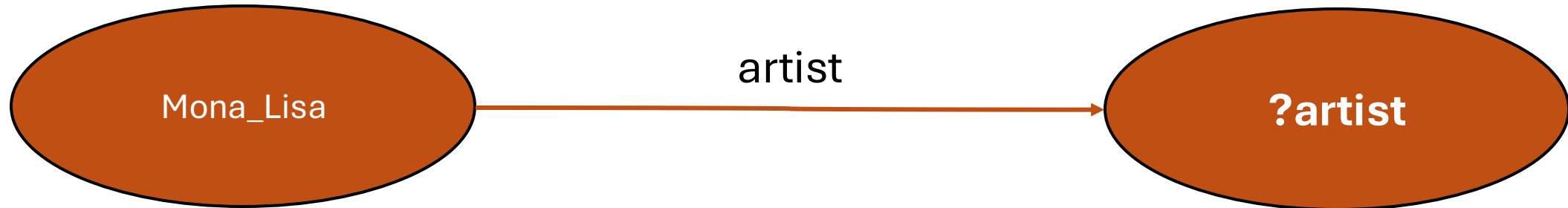
- RDF graphs
 - SPARQL queries
- } Triples



Query Graph Structure



Query Graph Structure



```
SELECT ?artist  
WHERE { Mona_Lisa artist ?artist. }
```



Breakdown of SPARQL Queries

PREFIX ex: <example-namespace-URI>

PREFIX rdfs: <www.w3.org/2000/01/rdf-schema>

SELECT ?artistName

FROM <example-dataset-URI>

WHERE {
ex:Mona_Lisa ex:artist ?artistURI.
?artistURI rdfs:label ?artistName.
}

LIMIT ...

Namespaces

Query Form

RDF Datasets URI

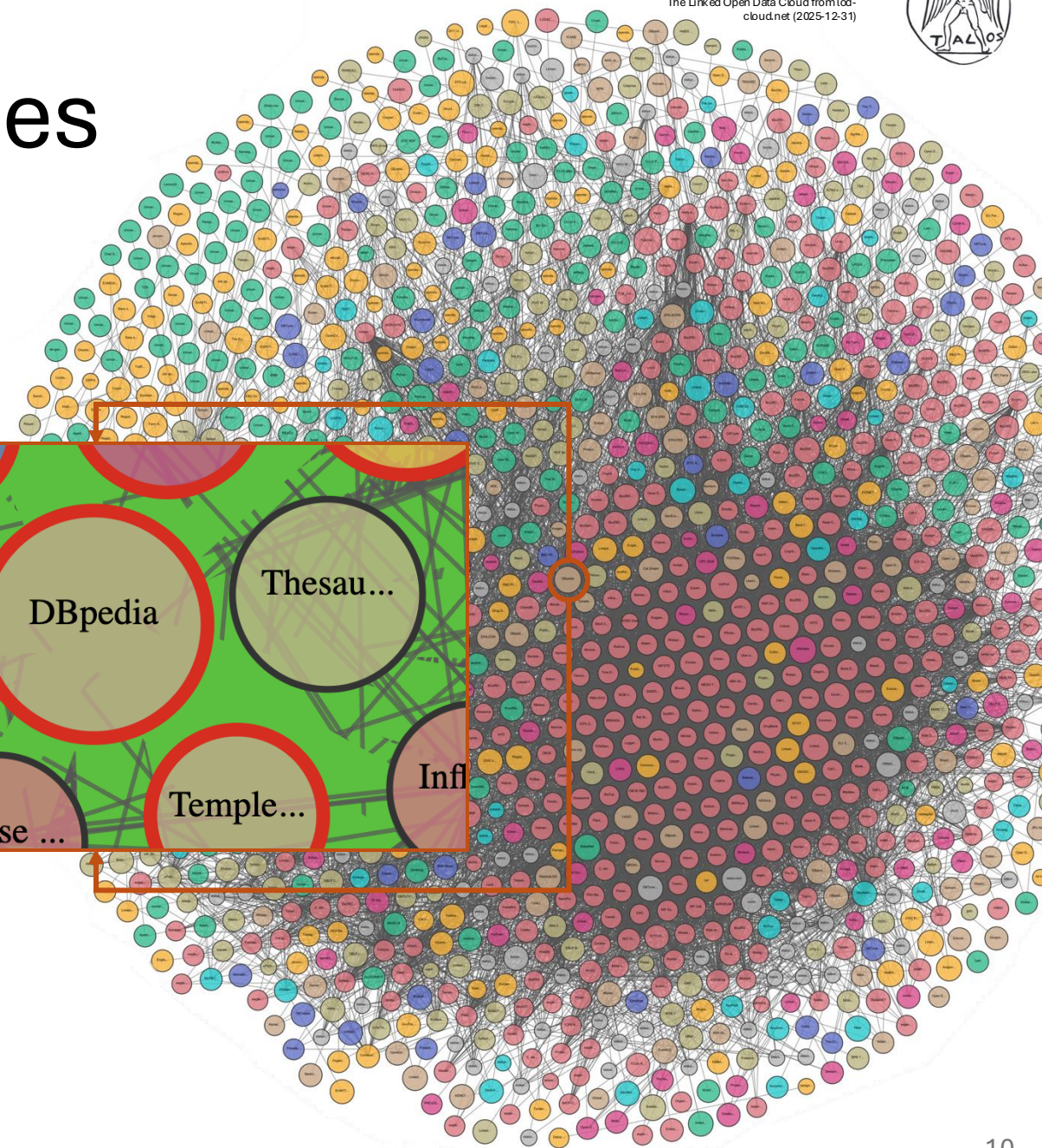
Query graph pattern

Modifiers



Executing SPARQL Queries

- SPARQL endpoints
- SPARQLer - General purpose processor
- DBpedia, BnF, data.europa.eu, Wikidata, Europeana...





Executing SPARQL Queries

SPARQL Query Editor

Default Data Set Name (Graph IRI)

http://dbpedia.org

Query Text

PREFIX dbr: <http://dbpedia.org/resource/>
PREFIX dbp: <http://dbpedia.org/property/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

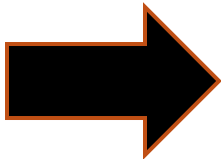
select ?artistName
where {dbr:Mona_Lisa dbp:artist ?artistURI.
?artistURI rdfs:label ?artistName}

Results Format

HTML

Execute Query

Reset



SPARQL HTML5 table	
artistName	
"Leonardo da Vinci"@en	
"ليوناردو دا فينشي"@ar	
"Leonardo da Vinci"@ca	
"Leonardo da Vinci"@cs	
"Leonardo da Vinci"@de	
"Λεονάρντο ντα Βίντσι"@el	
"Leonardo da Vinci"@eo	
"Leonardo da Vinci"@es	
"Leonardo da Vinci"@eu	

Executing SPARQL Queries

SPARQL Query Editor

Default Data Set Name (Graph IRI)

http://dbpedia.org

Query Text

PREFIX dbr: <http://dbpedia.org/resource/>
PREFIX dbp: <http://dbpedia.org/property/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

select ?artistDepiction
where {dbr:Mona_Lisa dbp:artist ?artistURI.
 ?artistURI foaf:depiction ?artistDepiction}

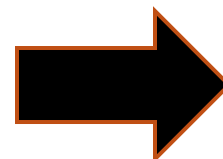
LIMIT 5

Results Format

HTML

Execute Query

Reset



SPARQL | HTML5 table

artistDepiction

http://commons.wikimedia.org/wiki/Special:FilePath/Leonardo_da_Vinci_-_RCIN_919000_Verso_The_bones_and_muscles_of_the_arm_c.1510-11.jpg
[http://commons.wikimedia.org/wiki/Special:FilePath/Da_Vinci_Vitruve_Luc_Viatour_\(cropped\).jpg](http://commons.wikimedia.org/wiki/Special:FilePath/Da_Vinci_Vitruve_Luc_Viatour_(cropped).jpg)
http://commons.wikimedia.org/wiki/Special:FilePath/Leonardo_da_Vinci_-_presumed_self-portrait_-_WGA12798.jpg
http://commons.wikimedia.org/wiki/Special:FilePath/Mona_Lisa,_by_Leonardo_da_Vinci,_from_C2RMF_retouched.jpg
http://commons.wikimedia.org/wiki/Special:FilePath/A_portrait_of_Leonardo,_by_Francesco_Melzi.jpg



By Attributed to Francesco Melzi - File:Francesco_Melzi_-_Portrait_of_Leonardo_-_WGA14795.jpg, Public Domain,
<https://commons.wikimedia.org/w/index.php?curid=78645105>

Executing SPARQL Queries

SPARQL Query Editor

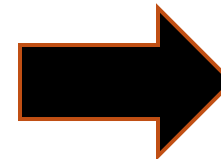
Default Data Set Name (Graph IRI)

http://dbpedia.org

Query Text

PREFIX dbr: <http://dbpedia.org/resource/>
PREFIX dbp: <http://dbpedia.org/property/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

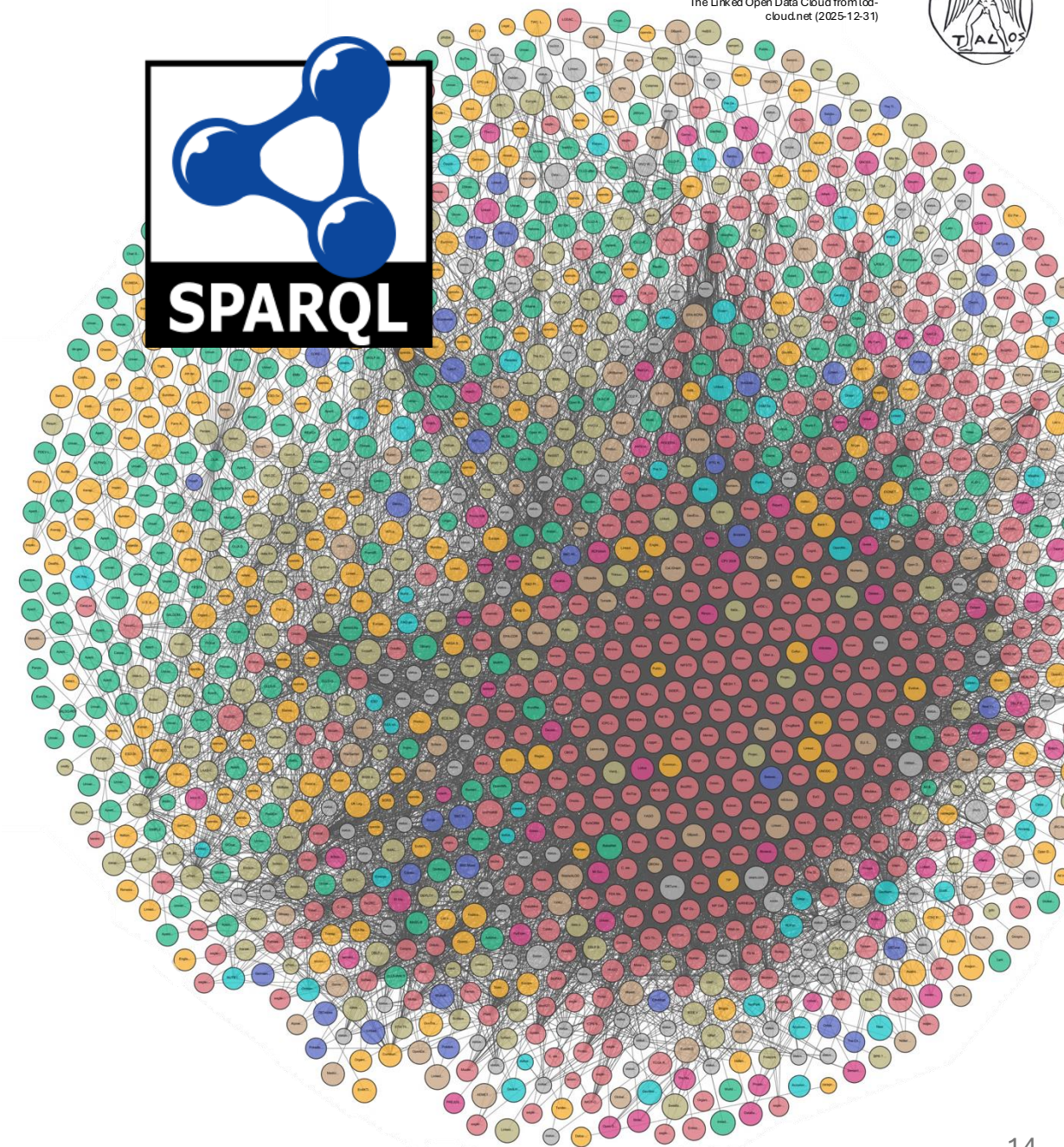
ASK
where {dbr:Mona_Lisa dbp:artist ?artistURI.
 ?artistURI rdfs:label "Leonardo da Vinci"@en}



true

Conclusion

- Powerful tool:
 - Query RDF data
 - Unlock the Semantic Web
- Main uses=> (re)search:
 - Semantics
 - Explore large datasets
 - Data from multiple sources



TALOS ERA CHAIR IN ARTIFICIAL INTELLIGENCE FOR HUMANITIES AND SOCIAL SCIENCES



ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
UNIVERSITY OF CRETE



Thank you!

Rafail Giannadakis

Research Assistant, TALOS-AI4SSH

giannadakis.uni@gmail.com

<https://talos-ai4ssh.uoc.gr/>



Horizon ERA Chair TALOS AI4SSH Project funded by the European Commission
Grant Agreement n° 101087269, <https://cordis.europa.eu/project/id/101087269>



Funded by the
European Union