

SPARQLing Biology: a beginners course

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2021-12-08 Semantic SbD Approaches



What is SPARQL?

- A query language

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- A query language for RDF data

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- A query language for RDF data

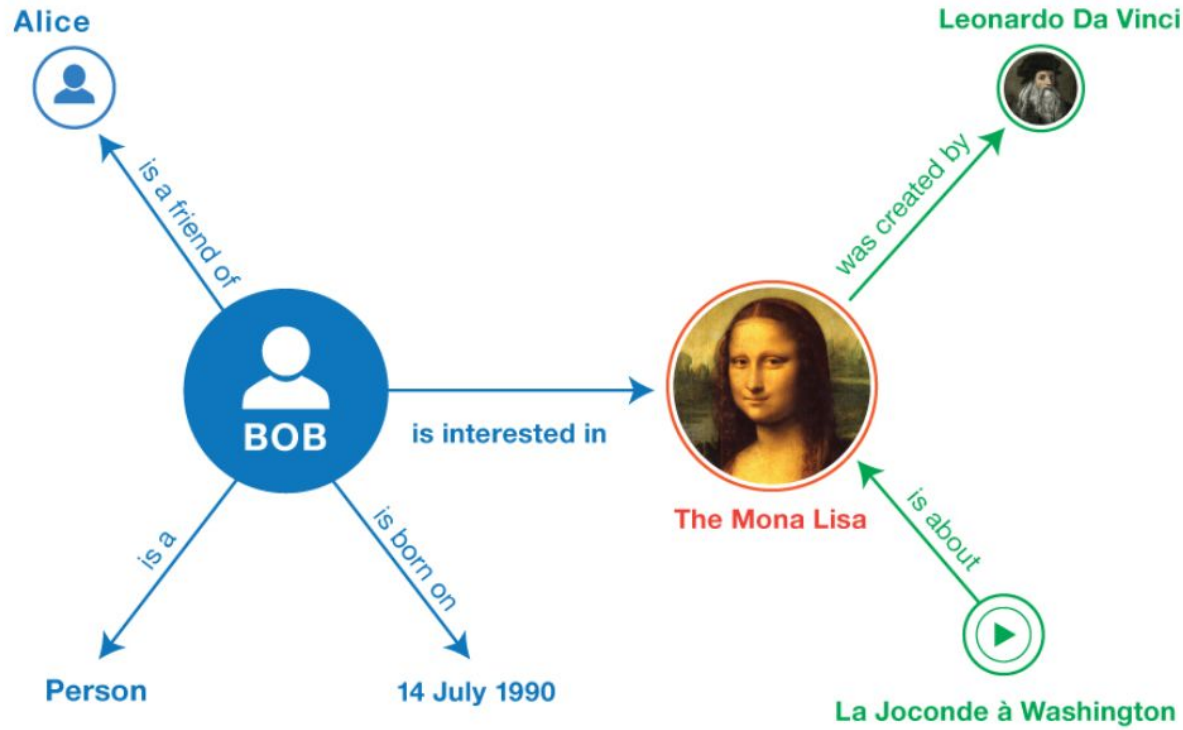
So let's have a look at RDF first!



What is RDF?

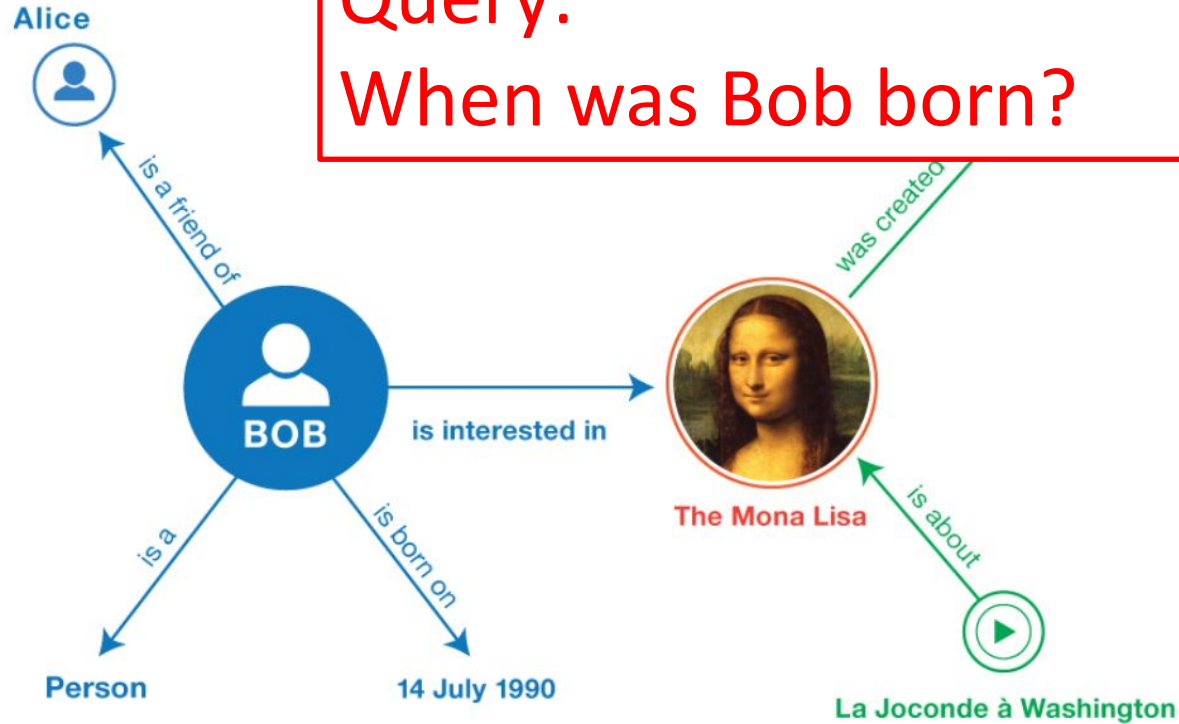
- The Resource Description Framework (RDF) is a framework for expressing information about resources.
- Resources can be anything, including documents, people, physical objects, and abstract concepts.

Example of RDF:



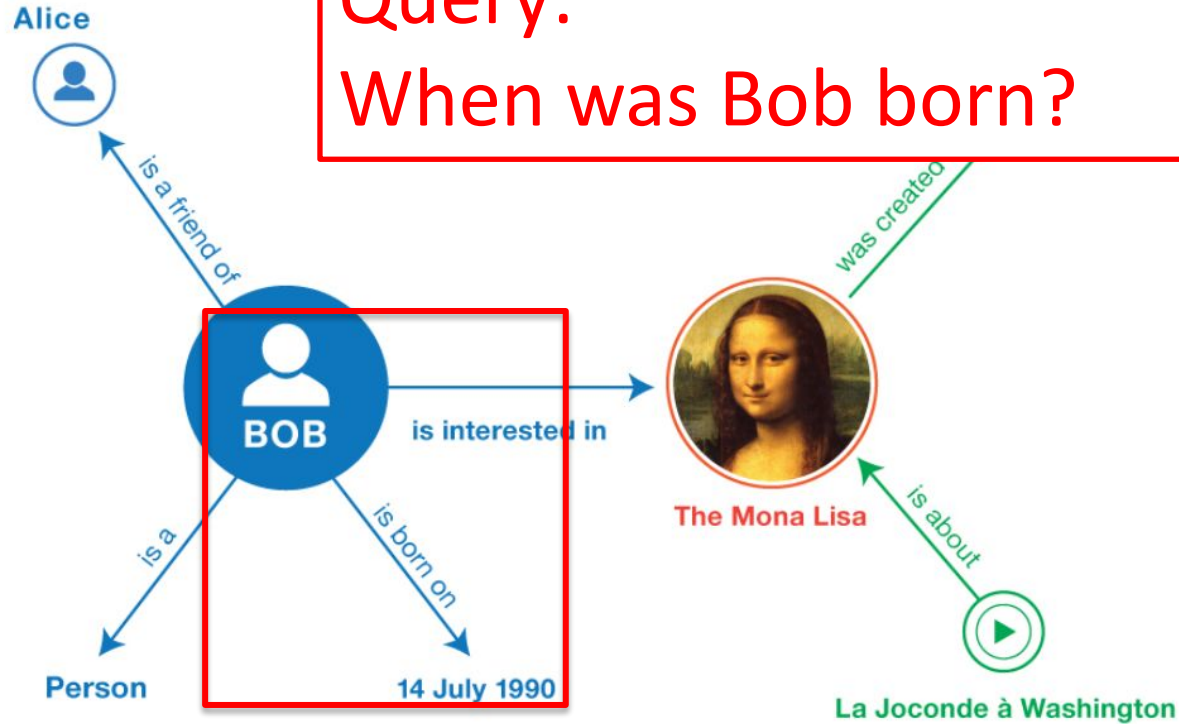
Example of RDF:

Query:
When was Bob born?



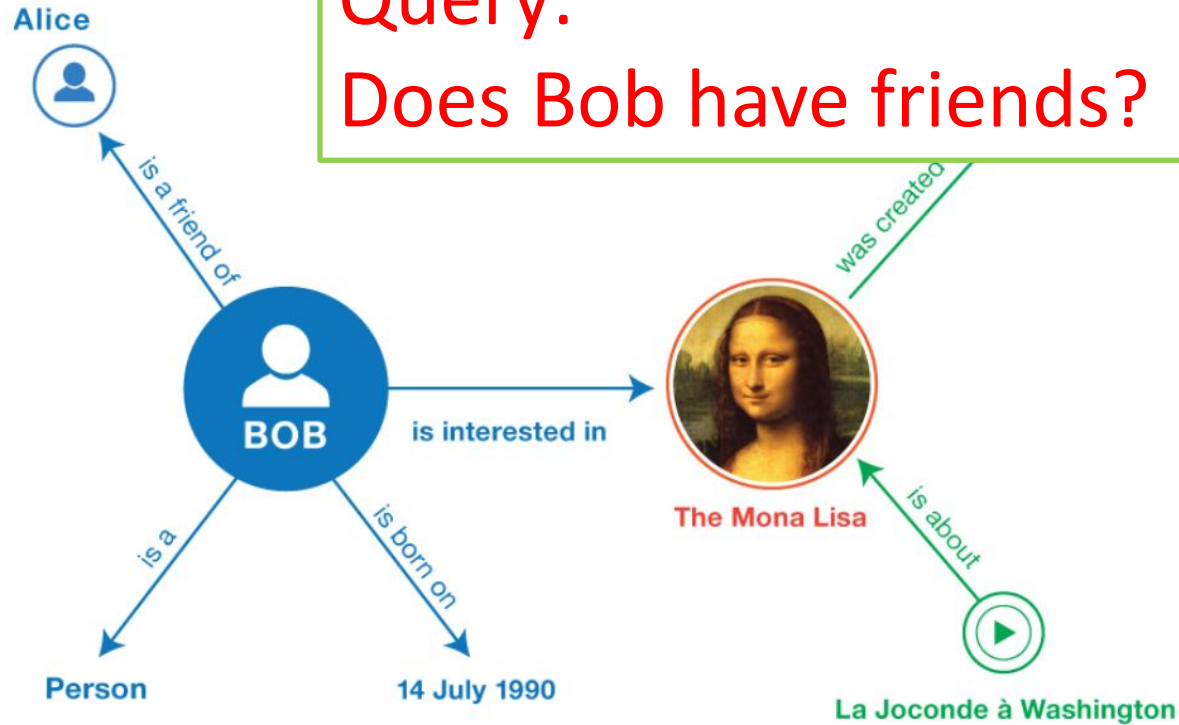
Example of RDF:

Query:
When was Bob born?



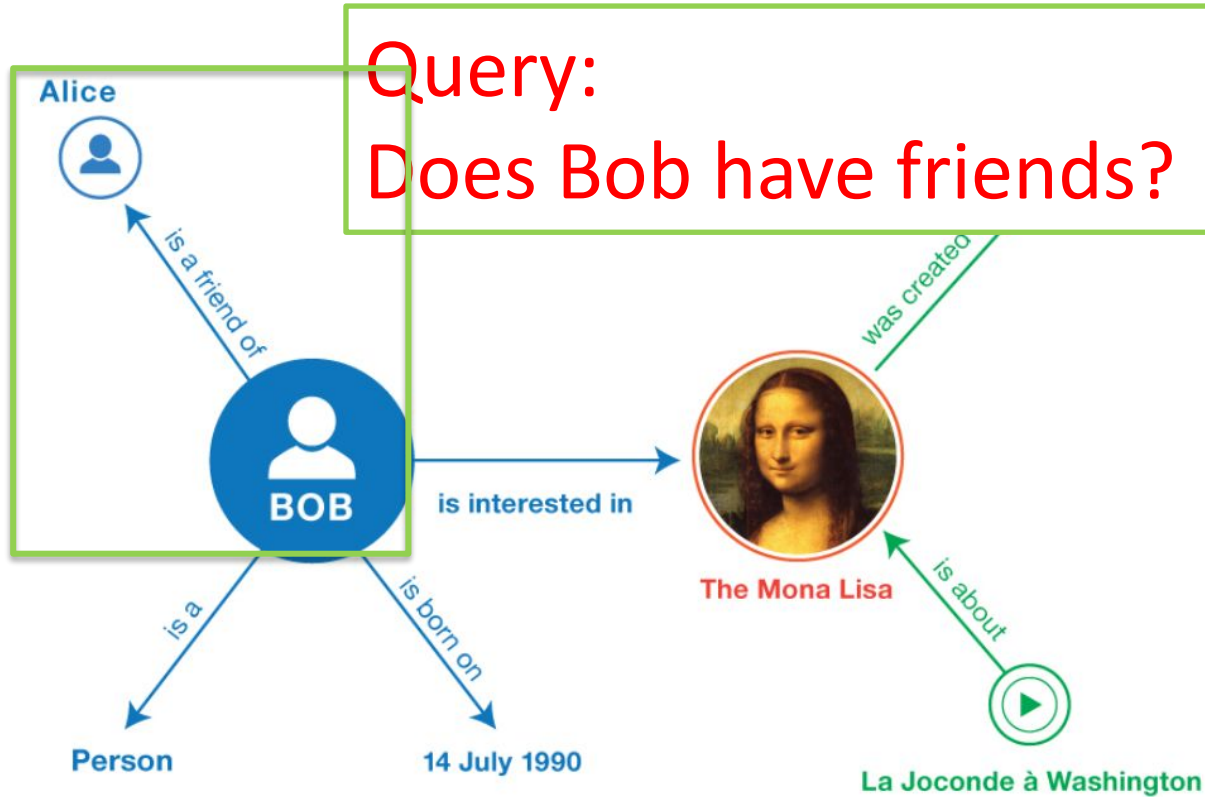
Example of RDF:

Query:
Does Bob have friends?



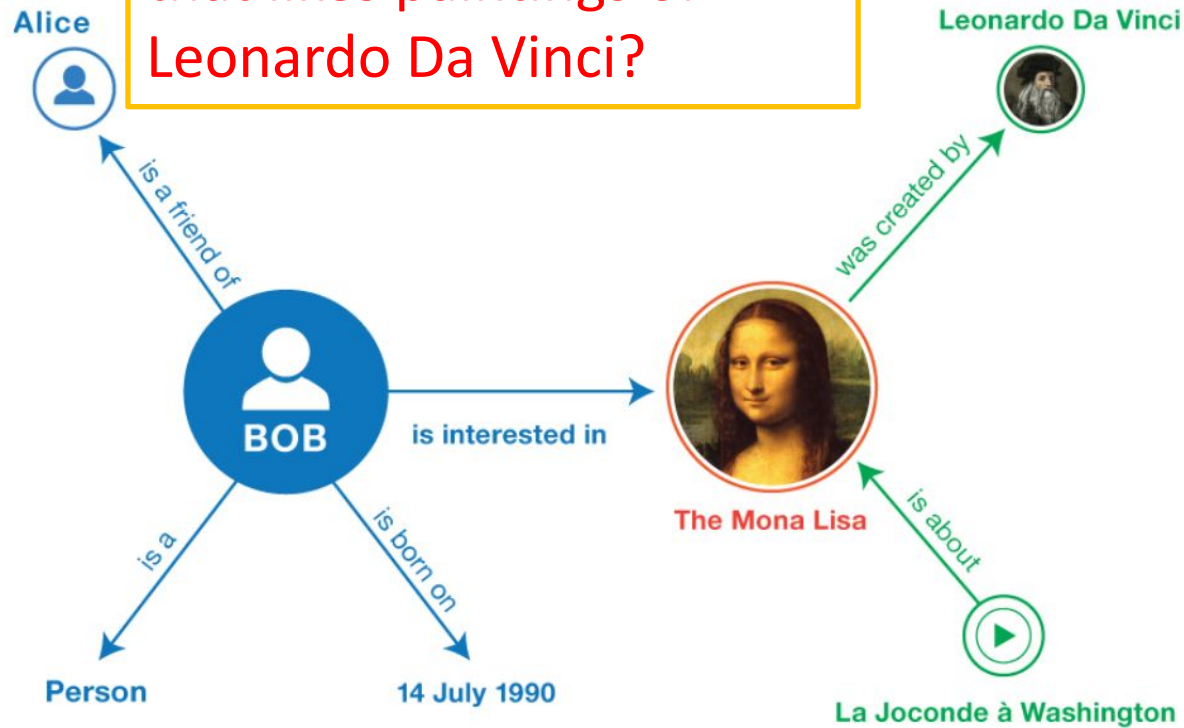
Example of RDF:

Query:
Does Bob have friends?



Exam

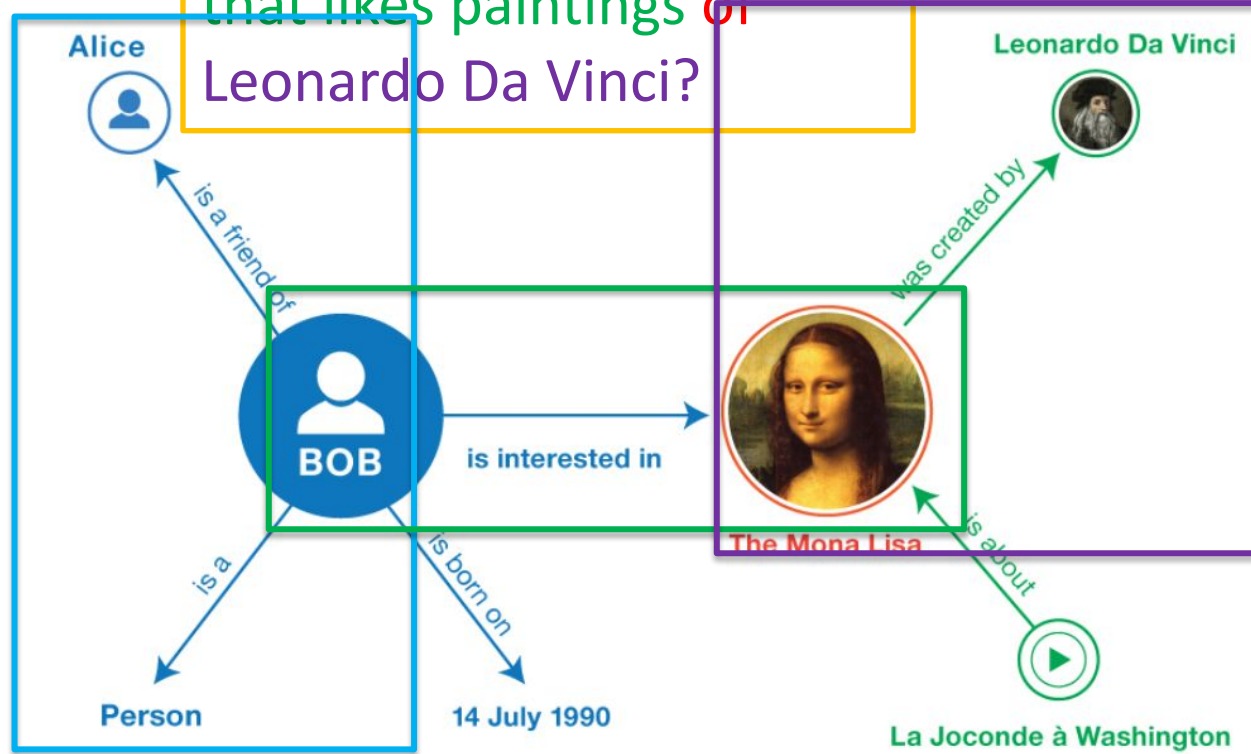
Query:
Does Alice know a Person
that likes paintings of
Leonardo Da Vinci?



Exam

Query:

Does Alice know a Person
that likes paintings of
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RDF structure:



RDF structure:



RDF structure:

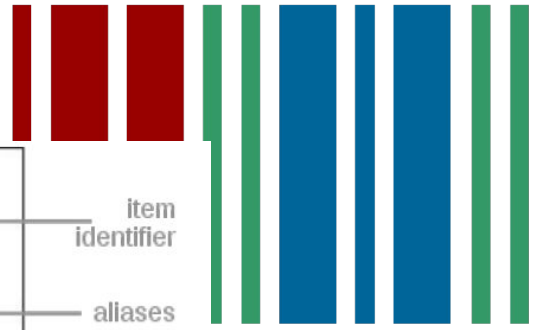


WIKIDATA

- Data is automatically stored in RDF structure
- Data is CC-0 licensed
- Data can be added by user community
- Data can be queried using SPARQL



WIKIDATA



WIKIDATA

label — **Douglas Adams** (Q42) — **item identifier**

description — English writer and humorist
Douglas Noël Adams | Douglas Noel Adams — **aliases**
▶ In more languages

Statements

property — **educated at** — **value**

rank — **St John's College** — **qualifiers**

end time	1974
academic major	English literature
academic degree	Bachelor of Arts
start time	1971

opened references

▼ 2 references

stated in	Encyclopædia Britannica Online
reference URL	http://www.nndb.com/people/731/000023662/
original language of work	English
retrieved	7 December 2013
publisher	NNDB
title	Douglas Adams (English)

+ add reference

collapsed reference

▶ 0 references

+ add (statement)

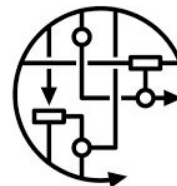
Let's get to work:

Workshop material can be found at:

<https://bigcat-um.github.io/SPARQLTutorialBioSB2019/>

Other biological databases with RDF:

- WikiPathways



WIKIPATHWAYS
Pathways for the People

- Rhea

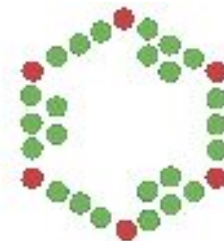


- Uniprot



- ChEMBL

ChEMBL



- And many more...

Other biological databases with RDF:

Can be queried with a so-called
“federated query”

Databases which allow federated query
to Wikidata can be found at:

https://www.wikidata.org/wiki/Wikidata:Lists/SPARQL_endpoints

WikiPathways Examples for Federated Queries:

[https://www.wikipathways.org/index.php/Help:WikiPathways_SPARQL_queries#Federated_queries - .21Under Construction.21](https://www.wikipathways.org/index.php/Help:WikiPathways_SPARQL_queries#Federated_queries_.21Under_Construction.21)



Update your own example queries here:

<https://github.com/BiGCAT-UM/SPARQLTutorialBioSB2019/tree/master/ParticipantQueries>

