SPARQLing Biology: a beginners course.

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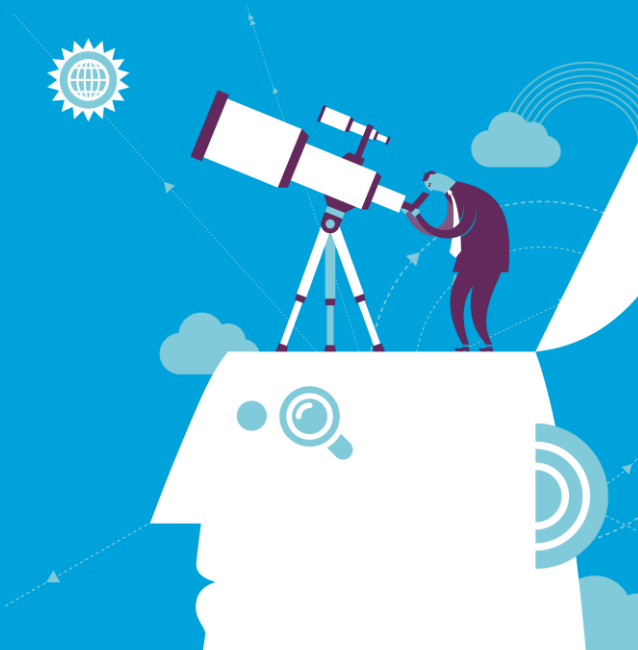
2019-04-02 BioSb 2019 Breakout session



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What is SPARQL?

- A query language

What is SPARQL?

- 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!

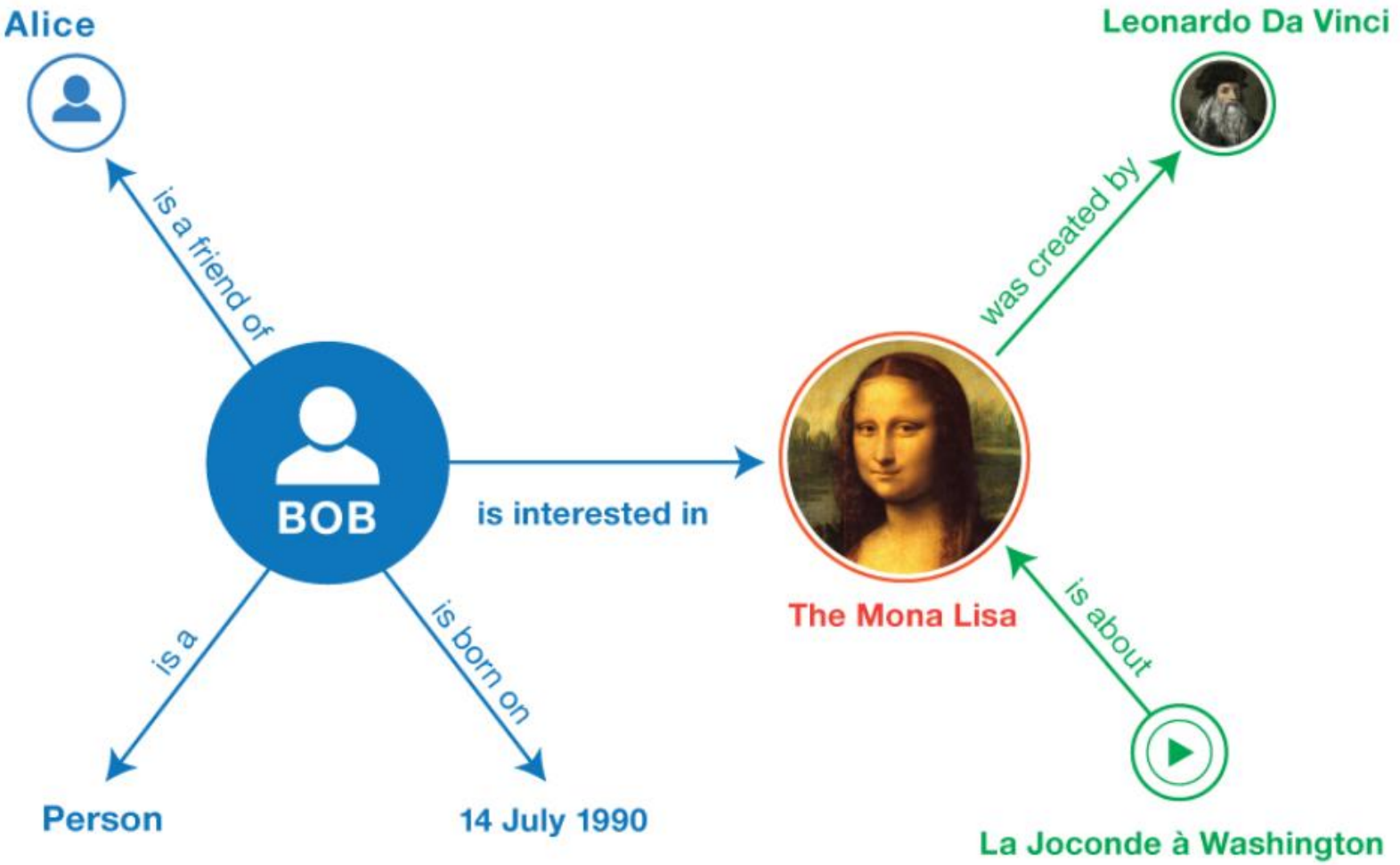
What is RDF?

- 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.

Source: https://dvcs.w3.org/hg/rdf/raw-file/default/rdf-primer/index.html

Example of RDF:

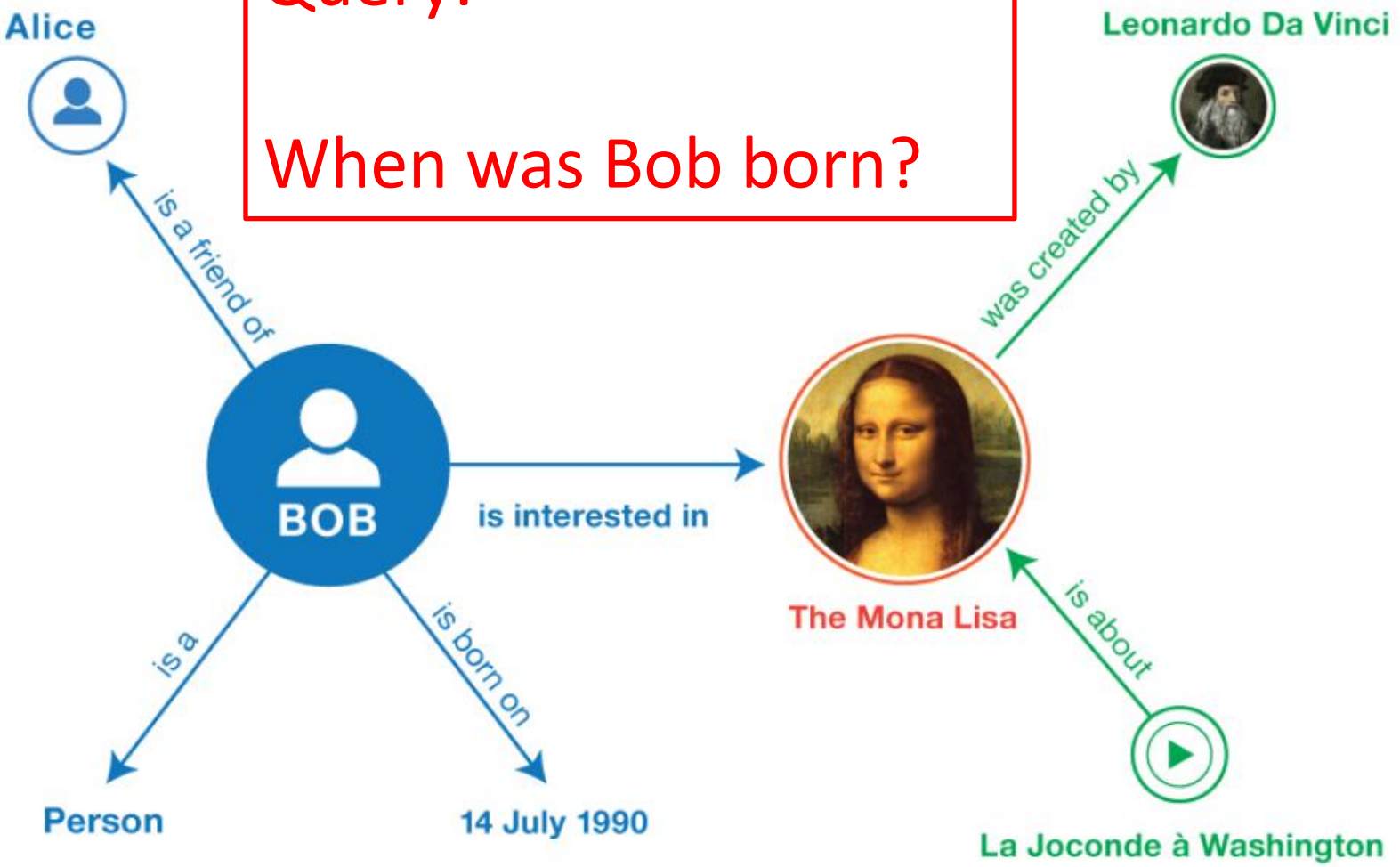


Source: https://dvcs.w3.org/hg/rdf/raw-file/default/rdf-primer/index.html

Example of RDF:

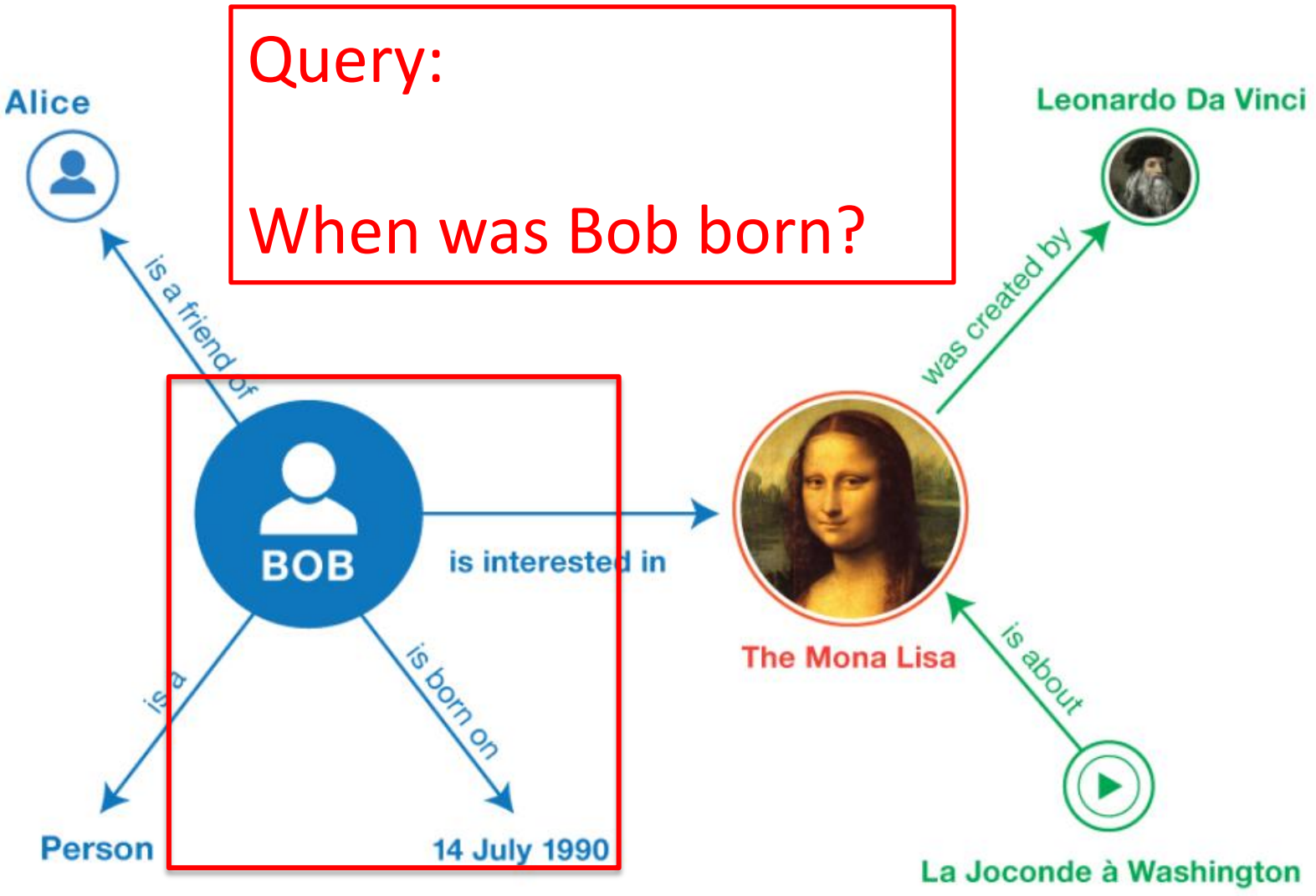
Query:

When was Bob born?



Source: https://dvcs.w3.org/hg/rdf/raw-file/default/rdf-primer/index.html

Example of RDF:

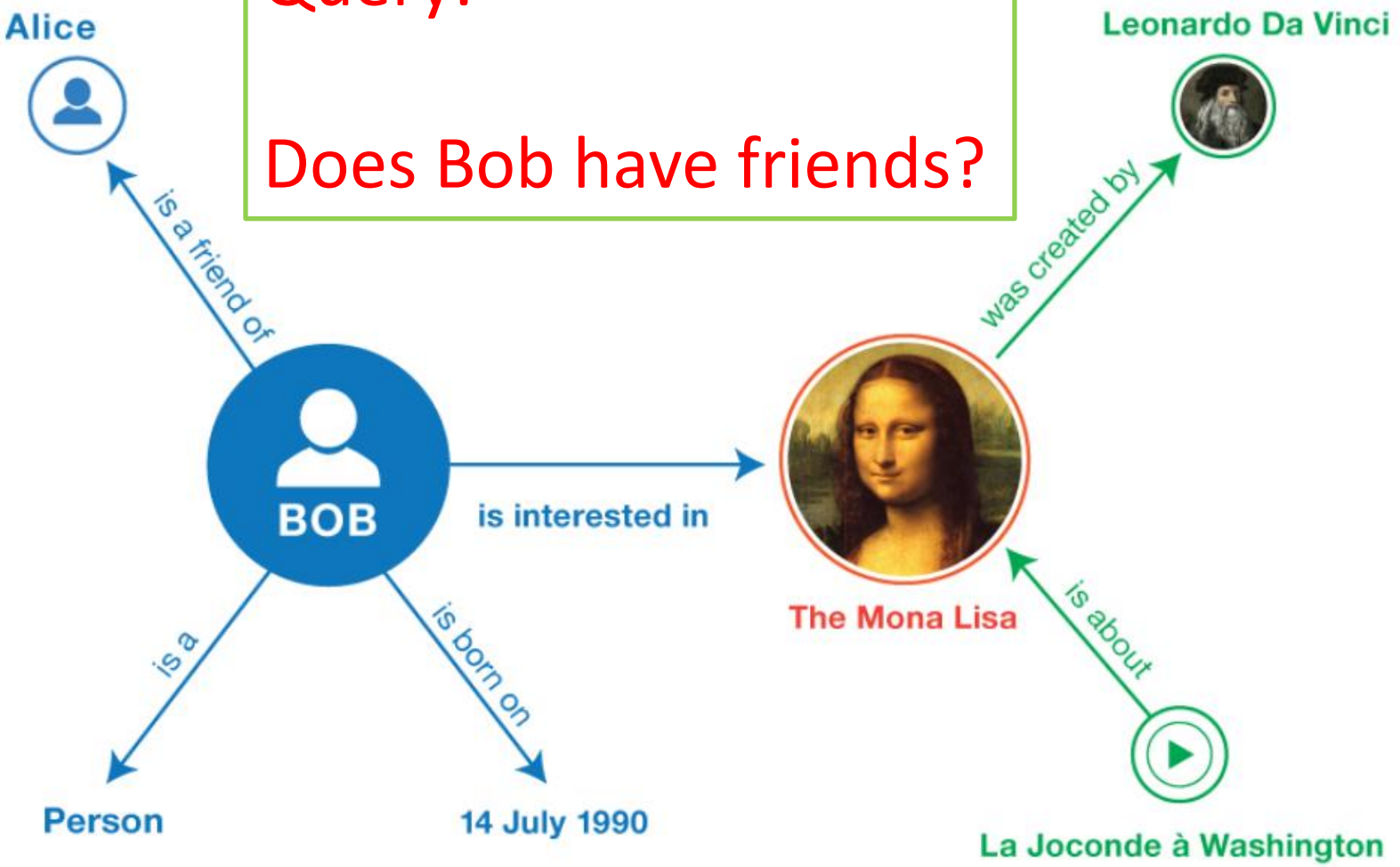


Source: https://dvcs.w3.org/hg/rdf/raw-file/default/rdf-primer/index.html

Example of RDF:

Query:

Does Bob have friends?



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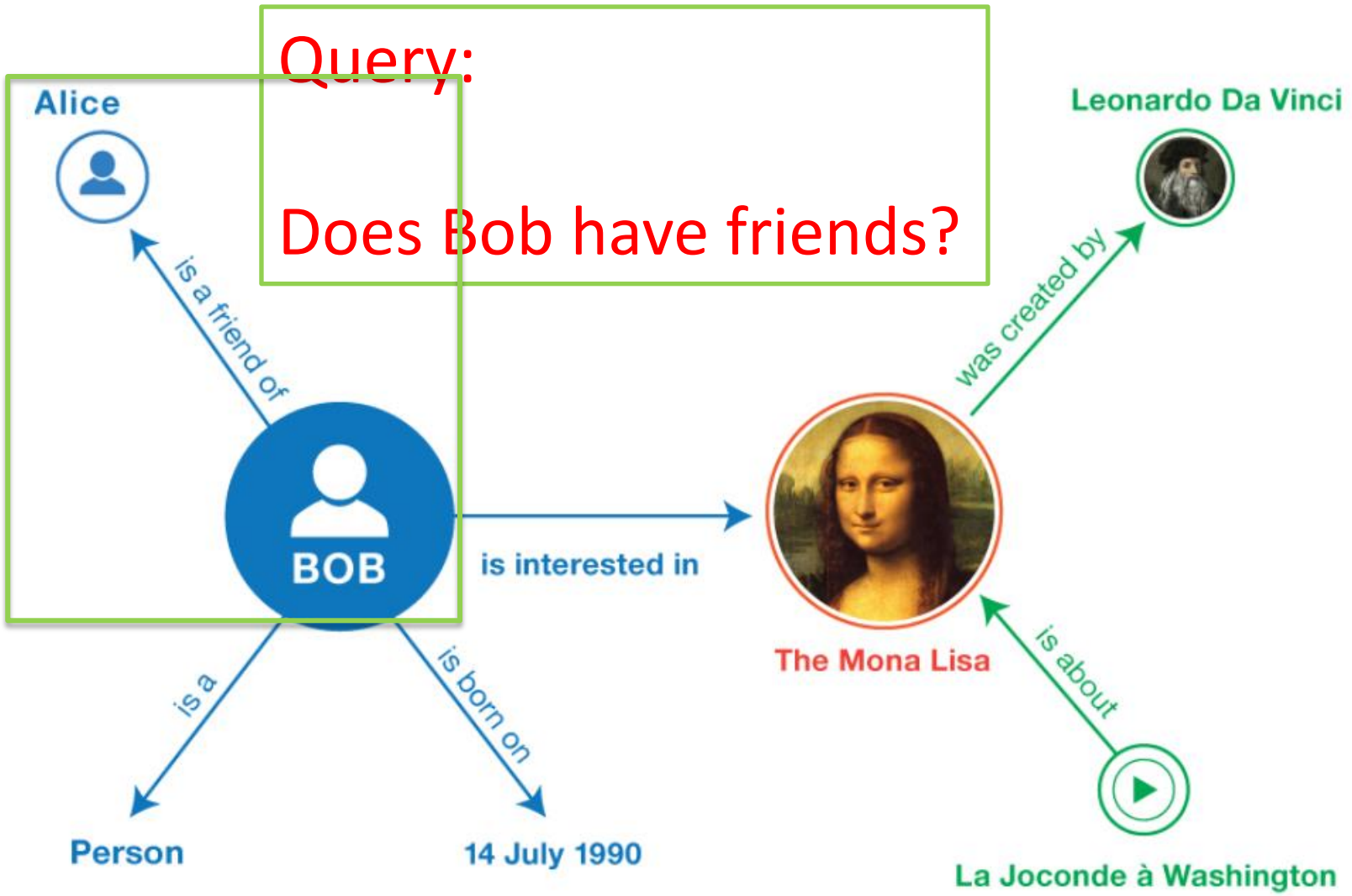
Example of RDF:

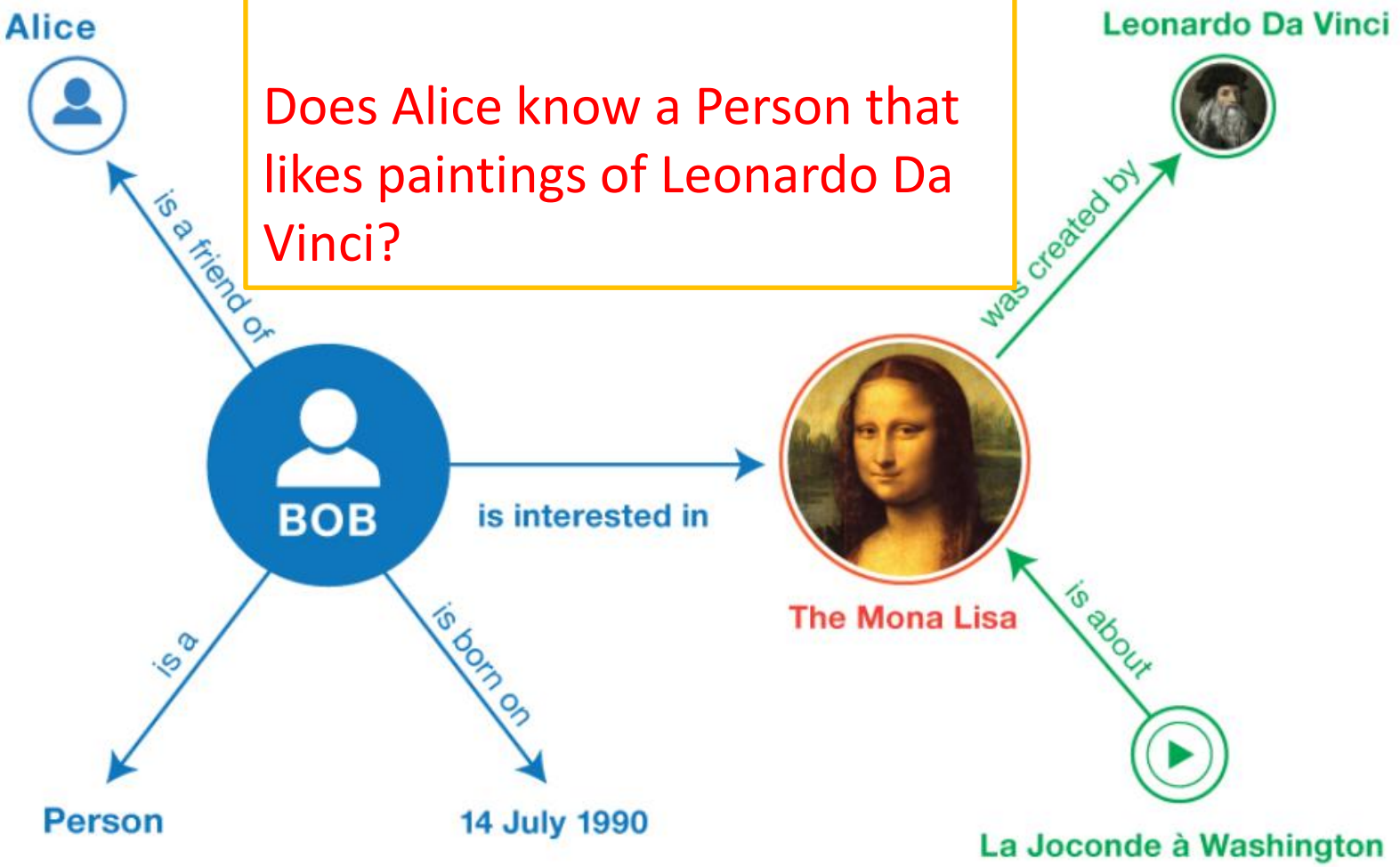


Source: https://dvcs.w3.org/hg/rdf/raw-file/default/rdf-primer/index.html

Example of RDF:

Query:

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



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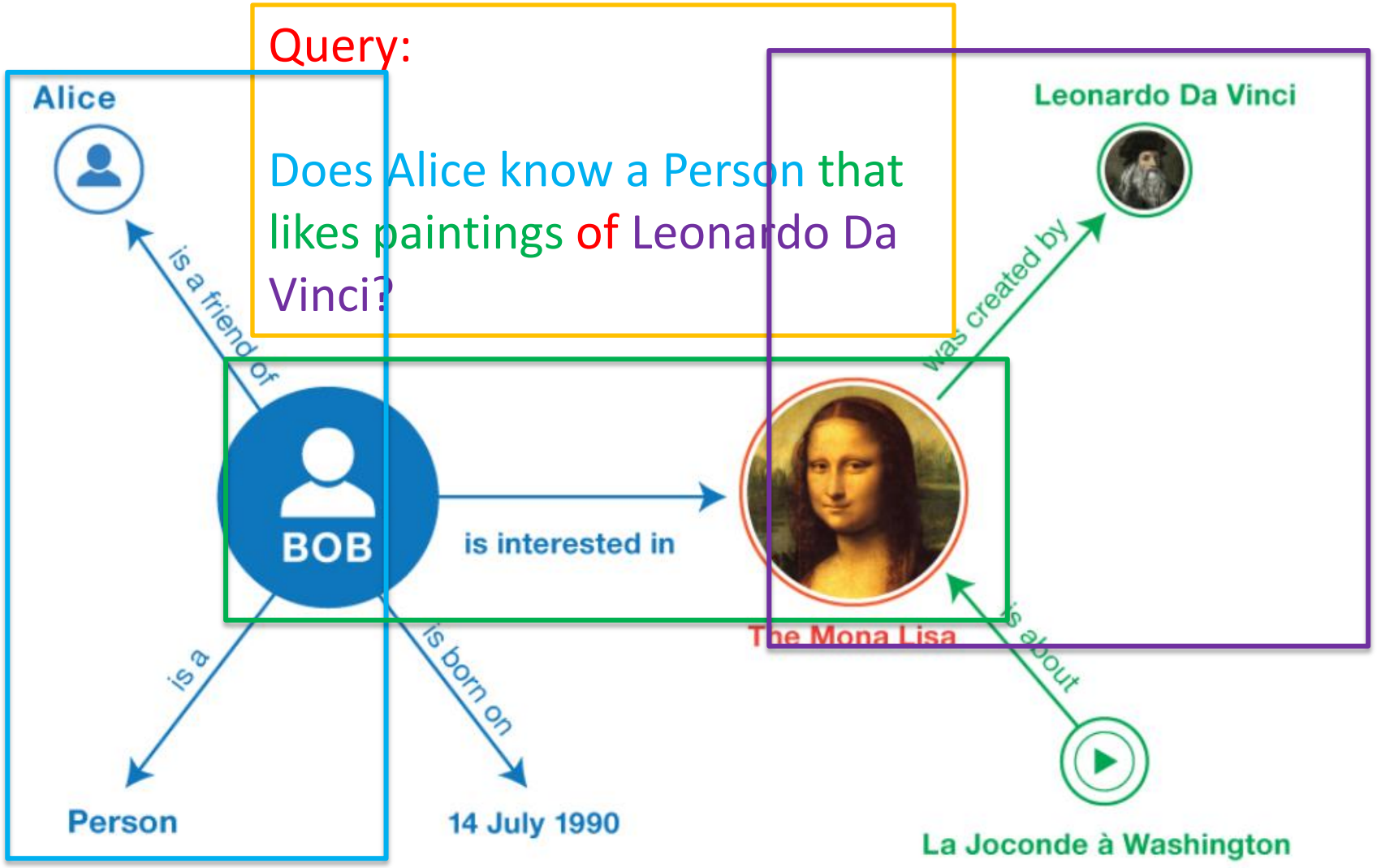
Example of RDF:



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RDF structure:

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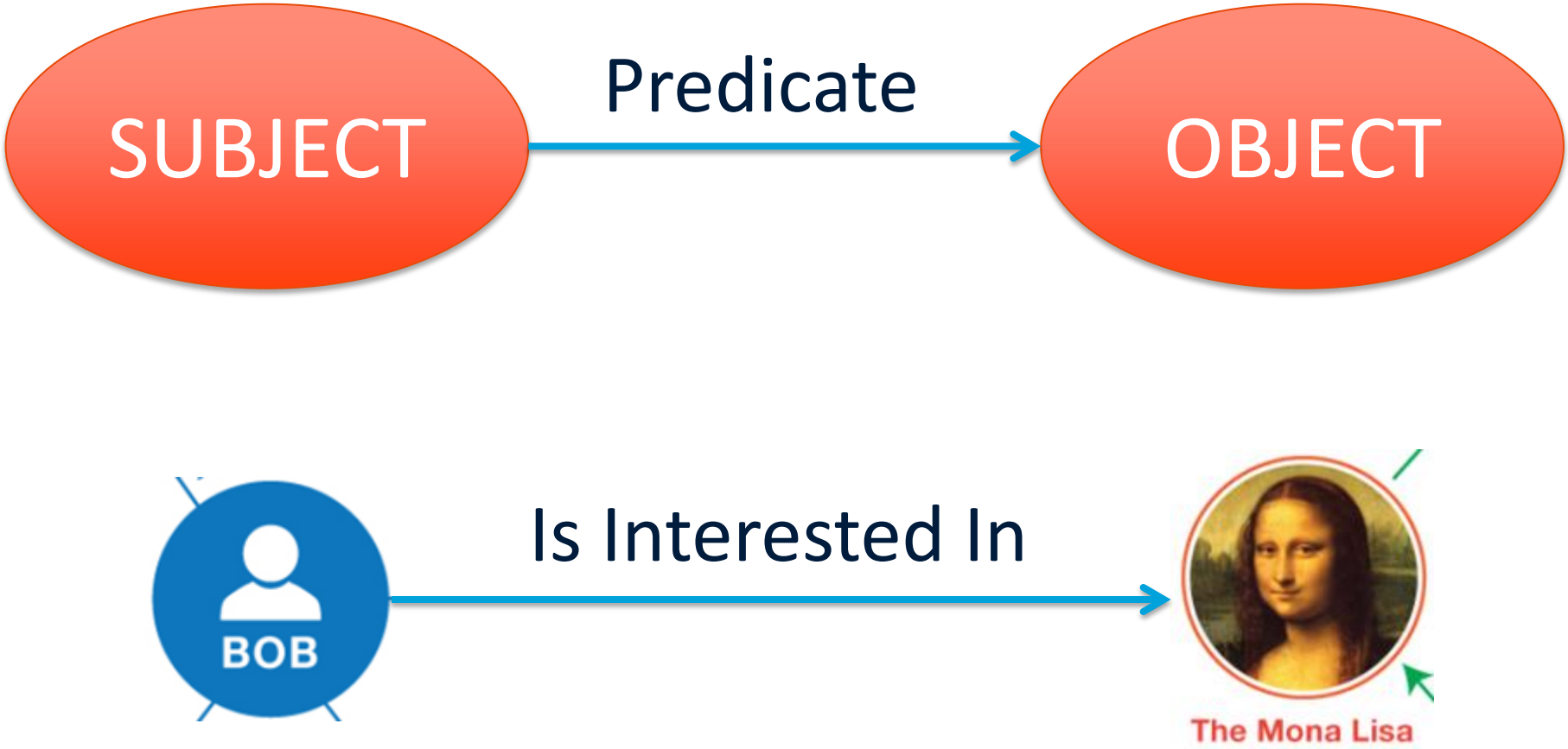
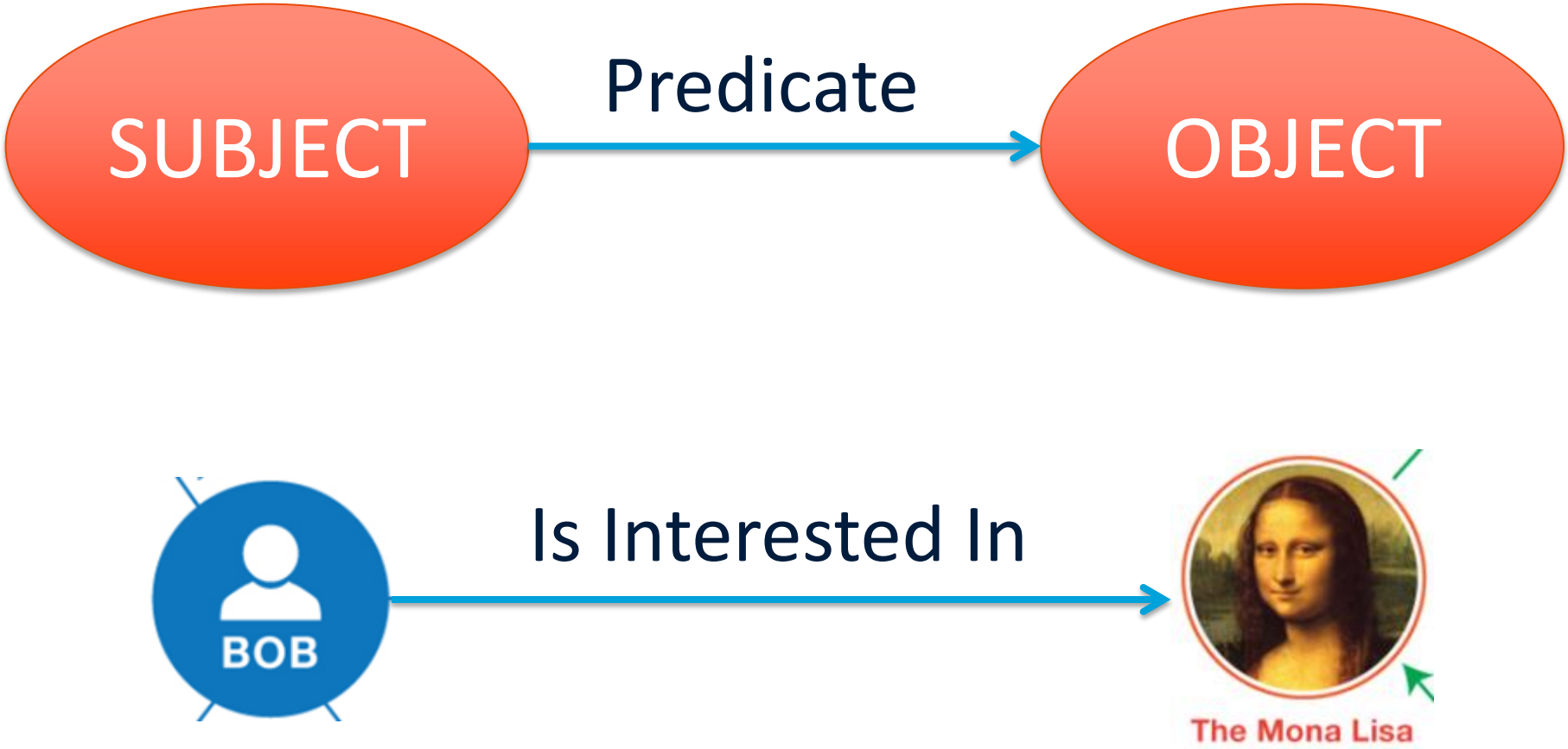


RDF structure:



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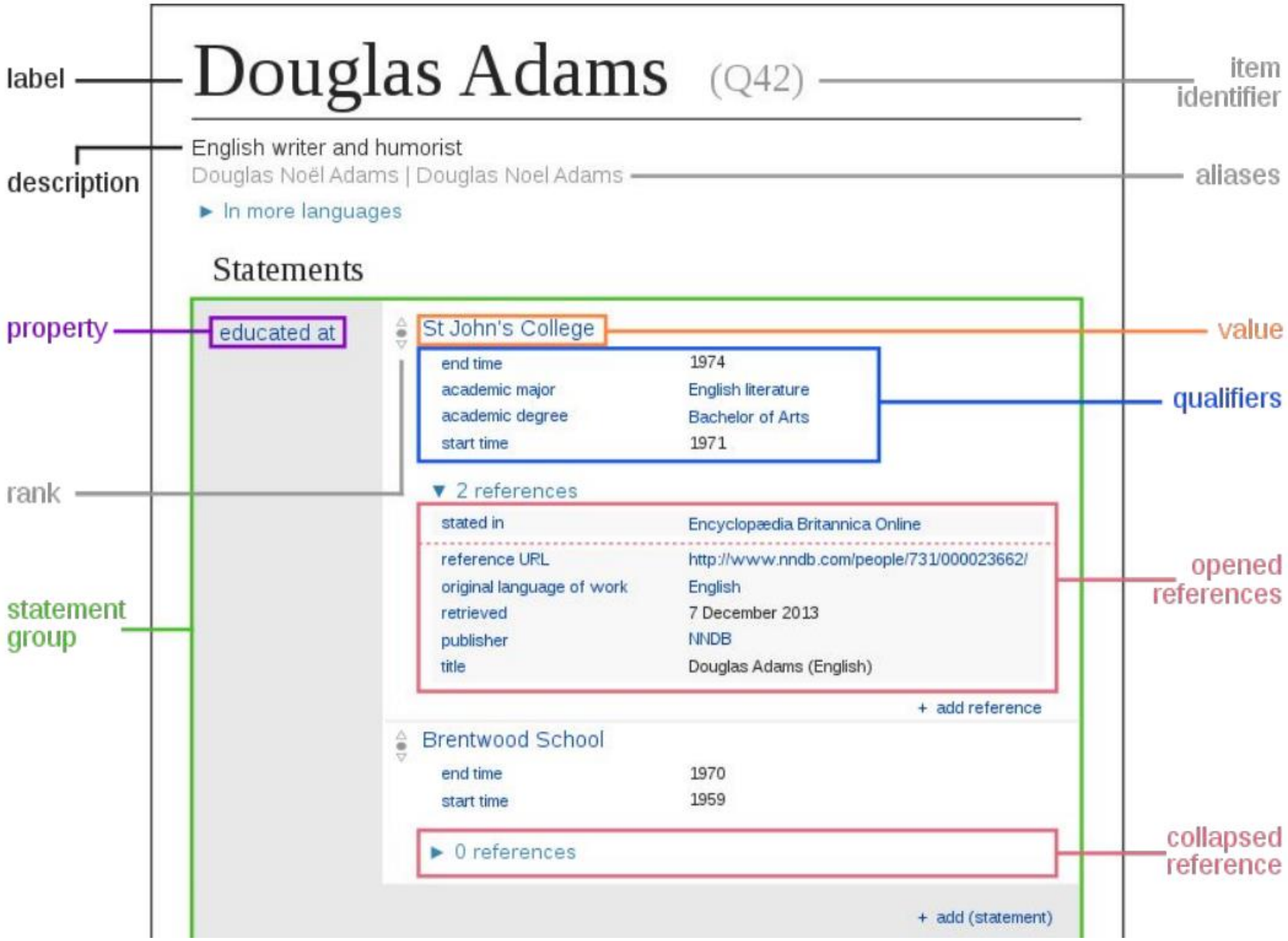
Triples

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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(Q42)
item identifier
description
English writer and humorist
Douglas Noël Adams | Douglas Noel Adams
aliases
► In more languages
Statements
property
educated at
St John's College
value
end time 1974
academic major English literature
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retrieved 7 December 2013
publisher NNDB
title Douglas Adams (English)
opened references
statement group
+ add reference
Brentwood School
end time 1970
start time 1959
► 0 references
collapsed reference
+ 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
- Rhea
- Uniprot
- ChEMBL
- And many more…

Rhea

UniProt

ChEMBL

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.mediawiki.org/wiki/Wikidata_Query_Service/User_Manual/SPARQL_Federation_endpoints

Update your own example queries here:

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