



ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
UNIVERSITY OF CRETE

ο Part I: From Graph to Knowledge Graph

Knowledge Graph for SSH: Part I

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Funded by the
European Union

Graph?



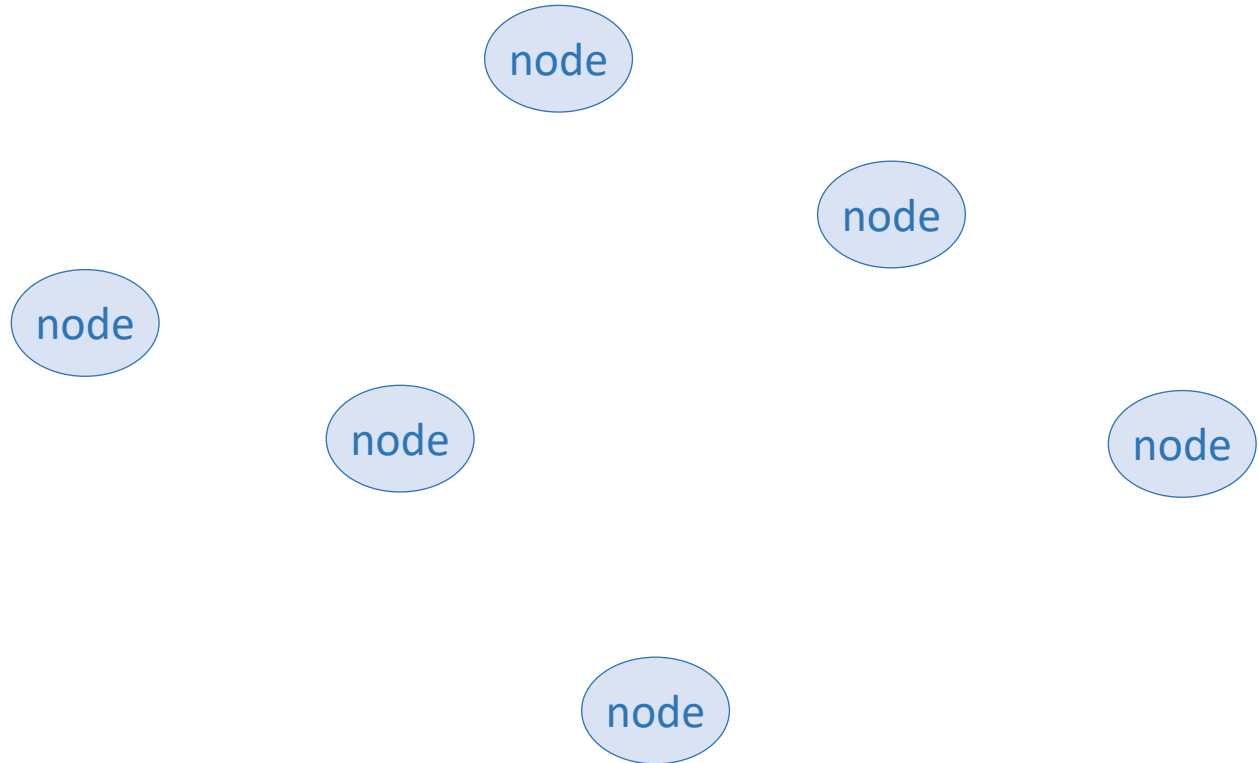
a graph composed of



Graph?



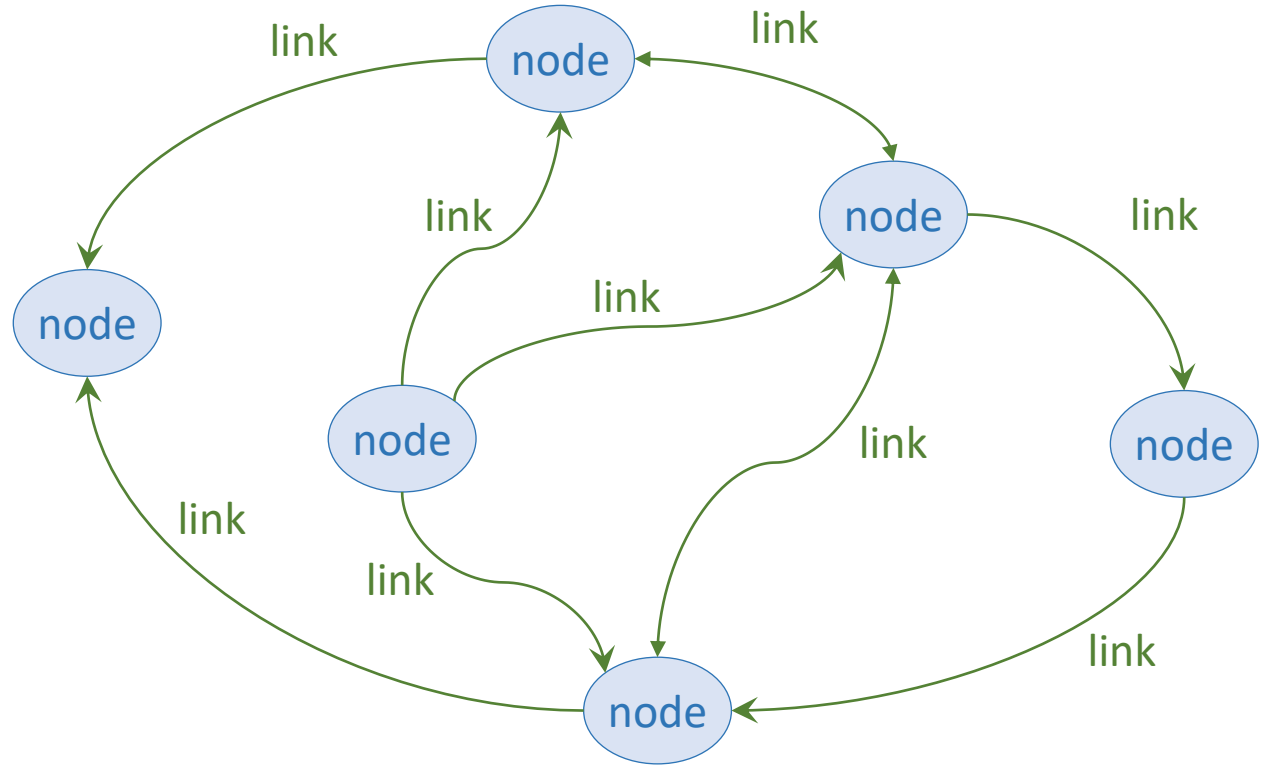
a graph composed of
nodes



Graph?



a graph composed of
nodes and links

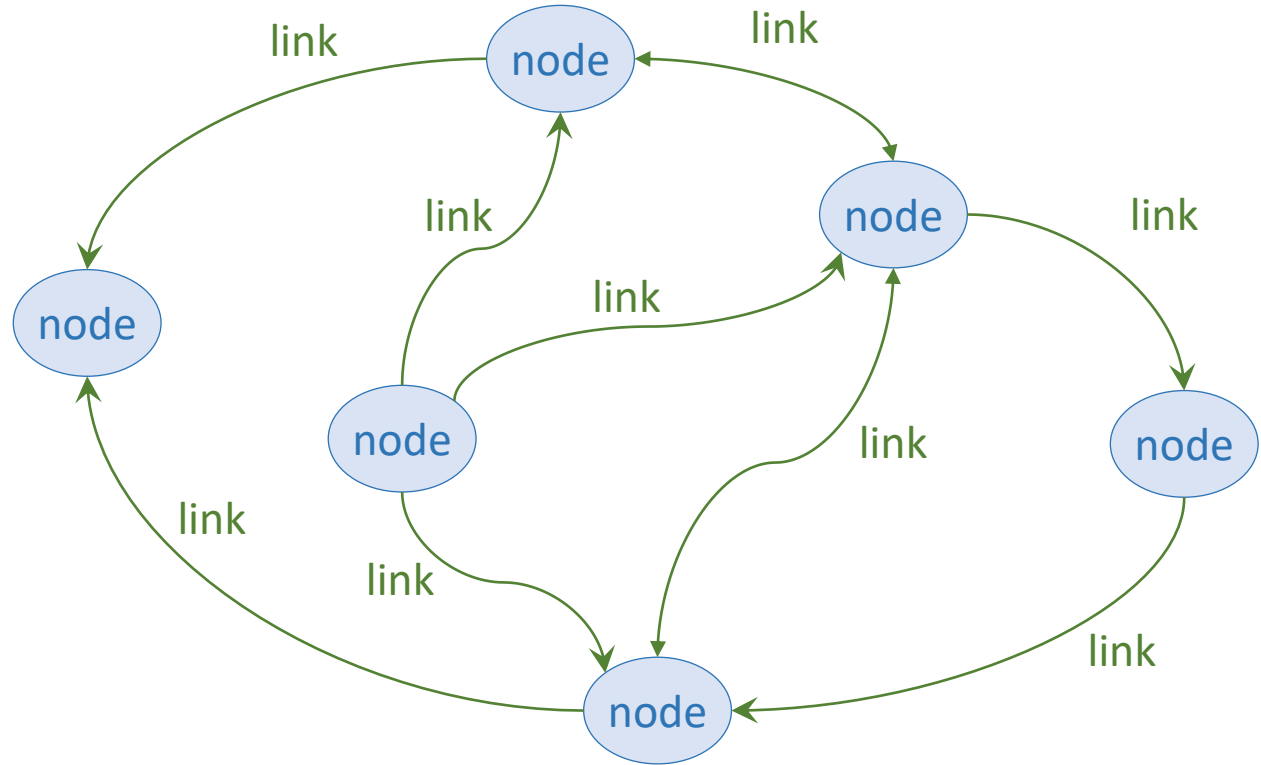


Knowledge Graph?



a graph composed of
nodes and links

which represent
domain knowledge

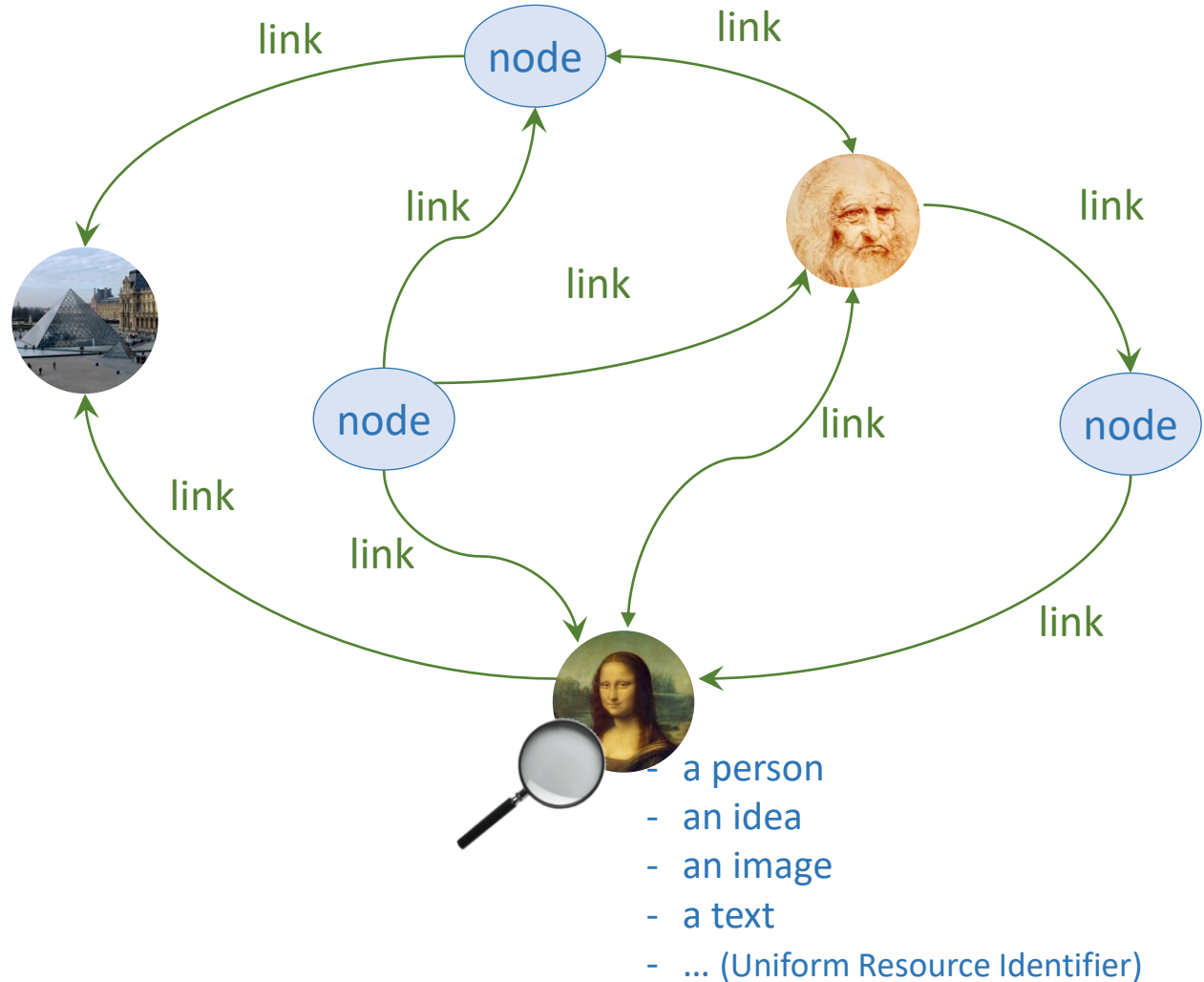


Knowledge Graph?



a graph composed of
nodes and links

which represent
domain knowledge



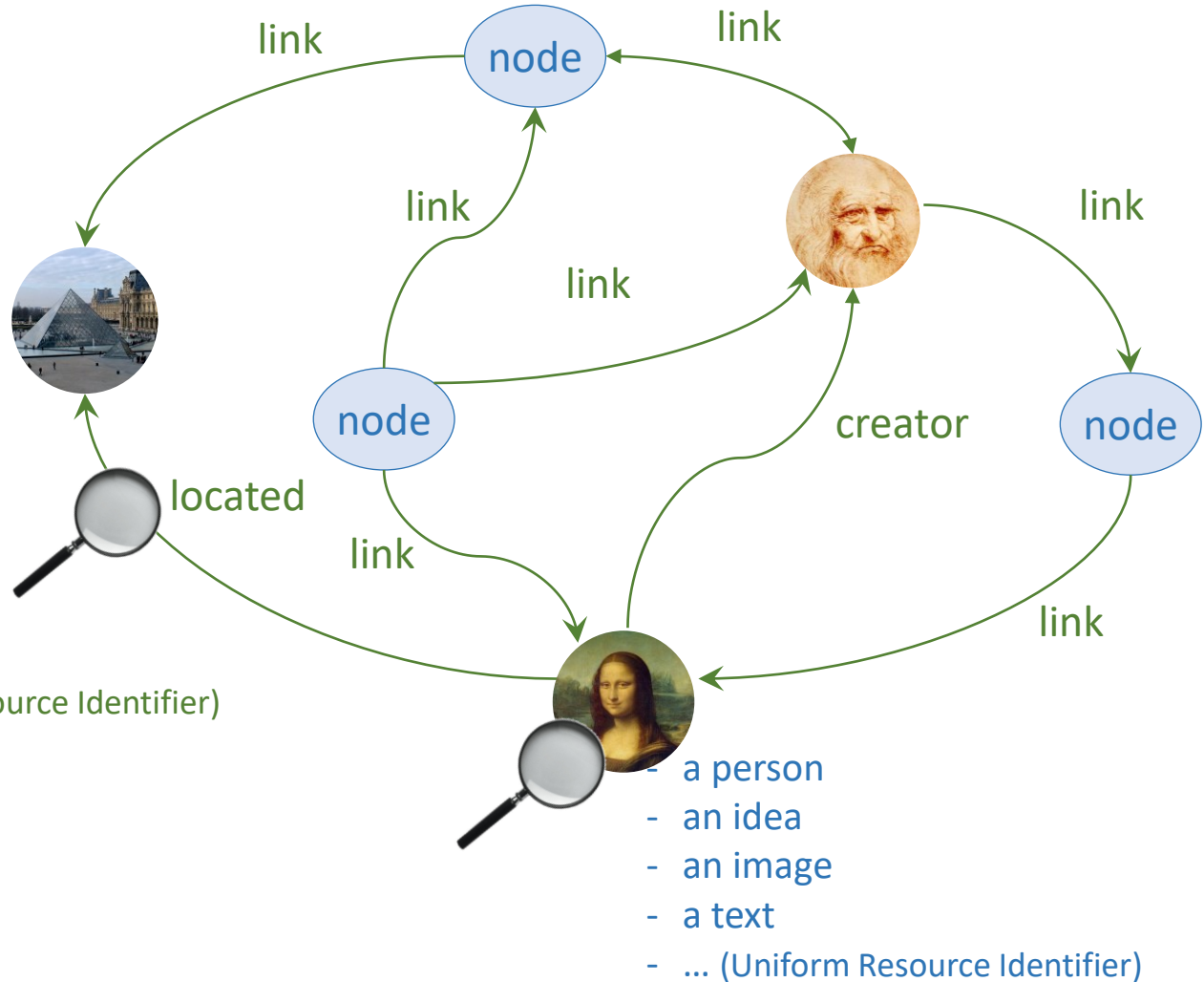
Knowledge Graph?



a graph composed of
nodes and links

which represent
domain knowledge

- is a
- has-name
- has-author
- has-image
- ... (Uniform Resource Identifier)



Knowledge Graph?

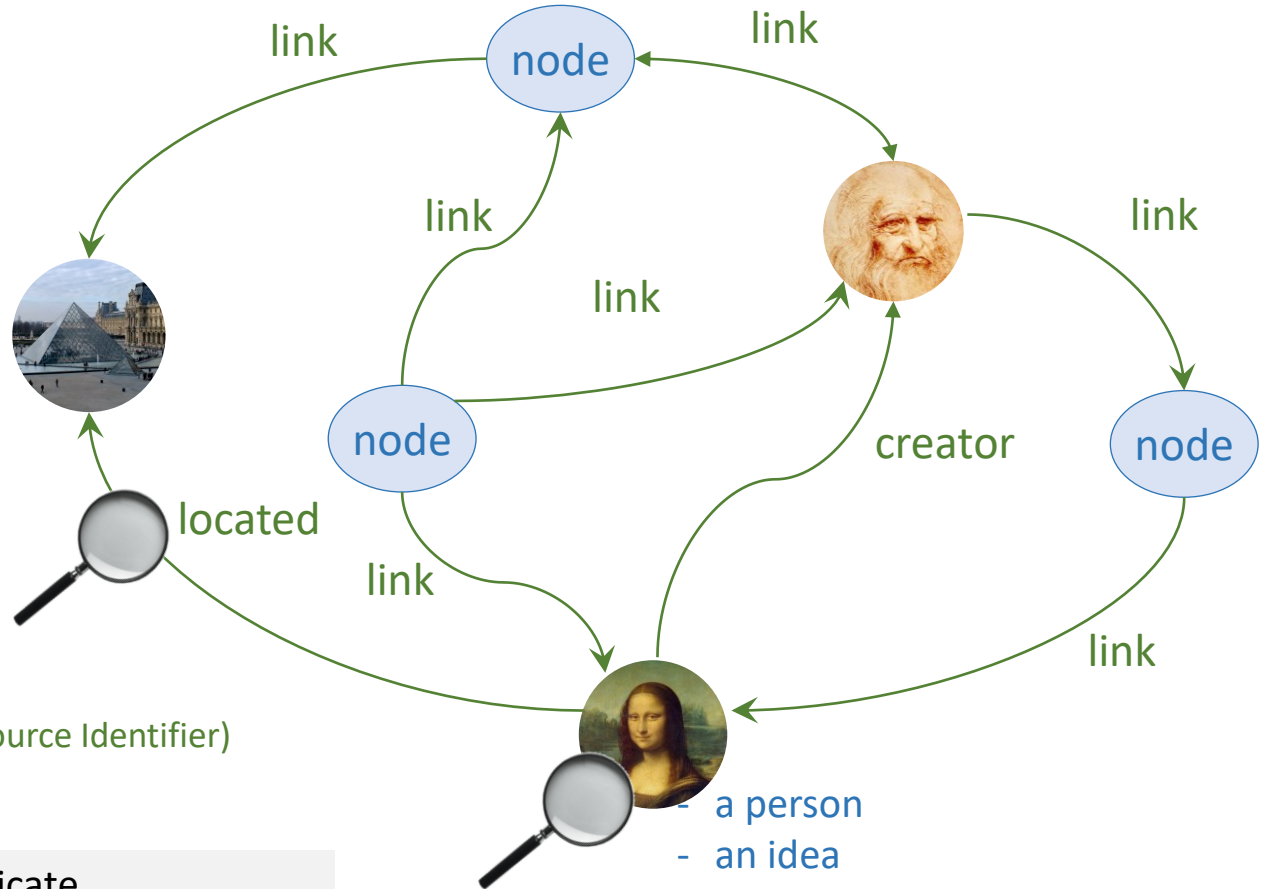
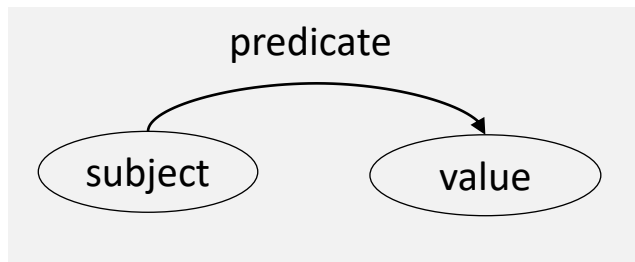


a graph composed of
nodes and links

which represent
domain knowledge

- is a
- has-name
- has-author
- has-image
- ... (Uniform Resource Identifier)

Triple



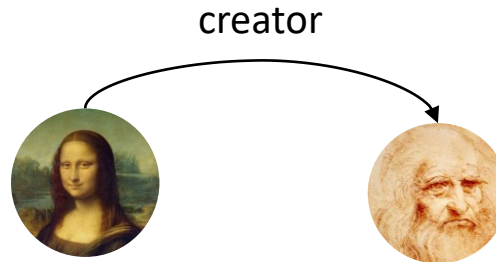
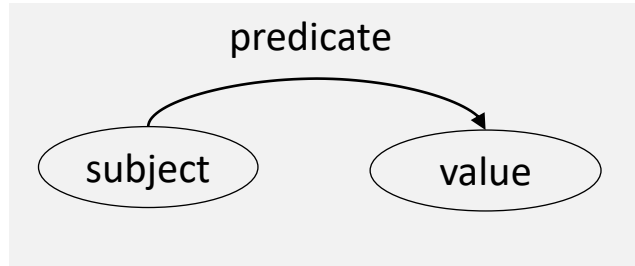
- a person
- an idea
- an image
- a text
- ... (Uniform Resource Identifier)



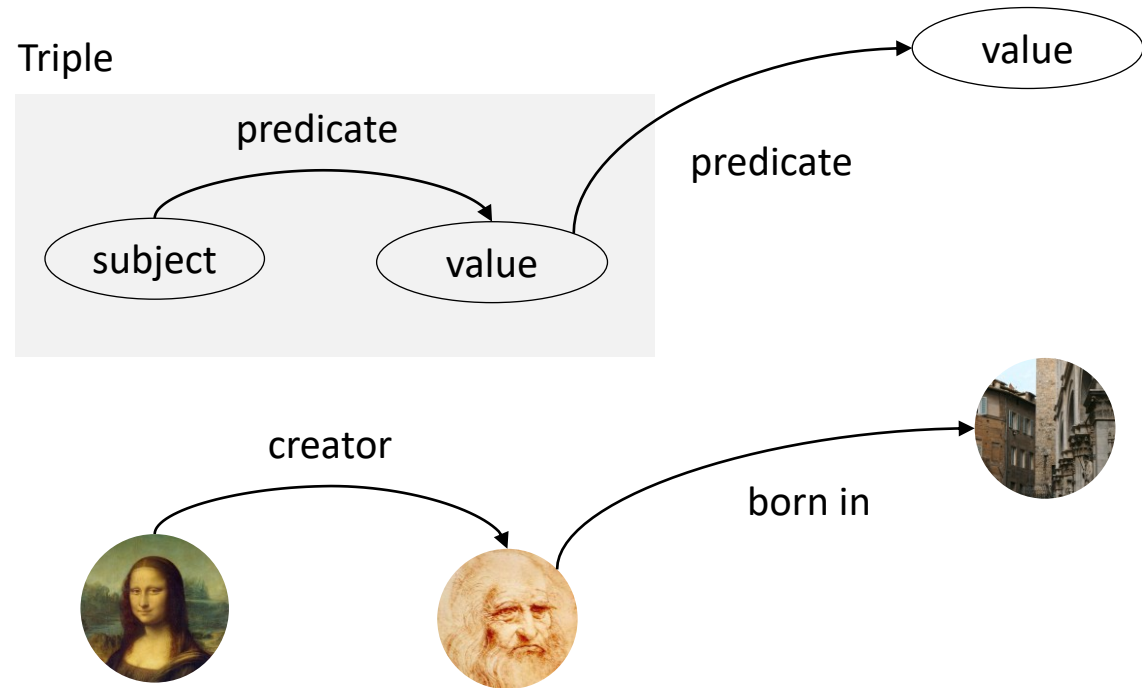
Knowledge Graph?



Triple



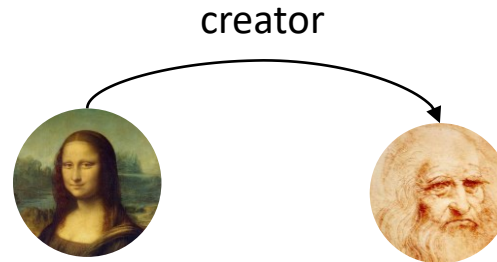
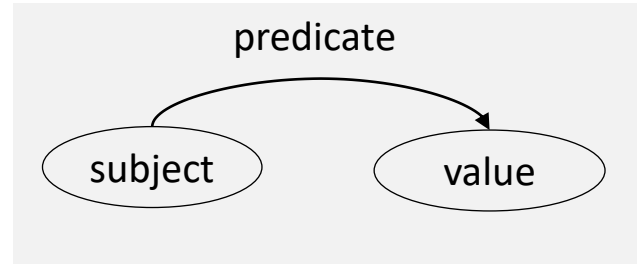
Knowledge Graph?



Knowledge Graph?



Triple



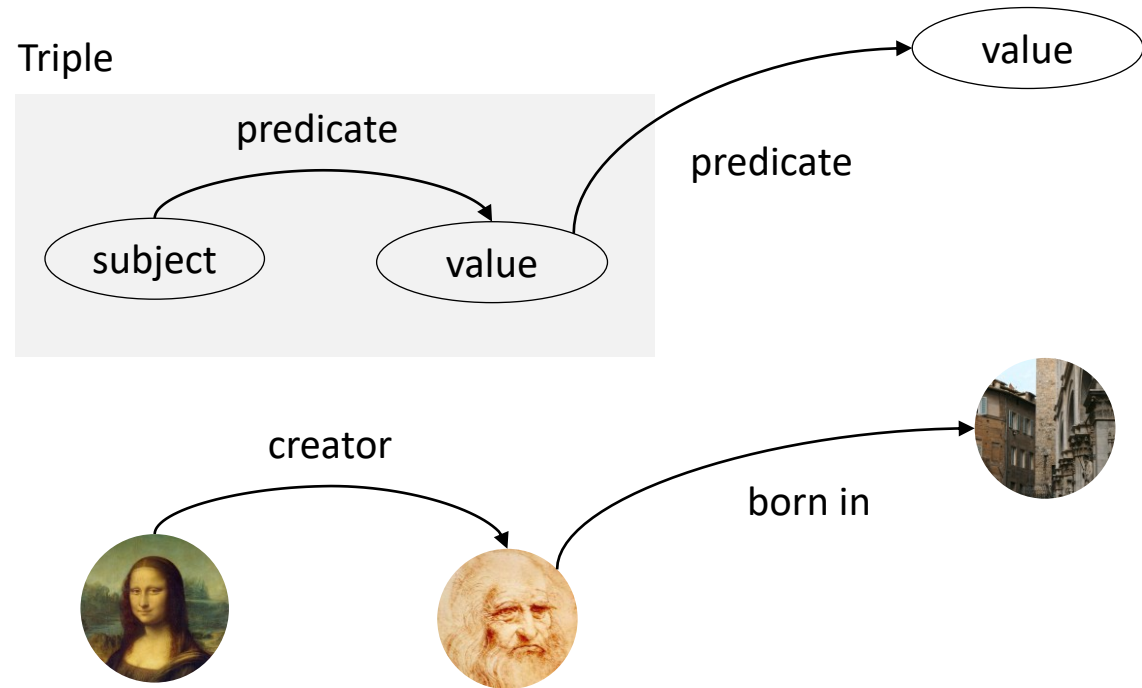
Can you draw graphs to represent these statements as triples?

Plato — born in — Athens

Sappho — is a — poet

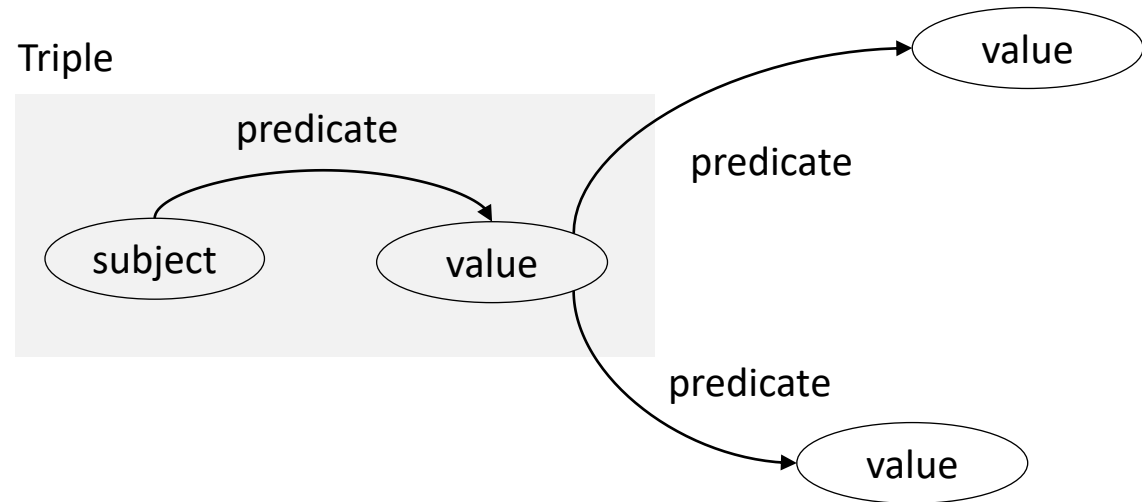
The Iliad — has-author — Homer

Knowledge Graph?

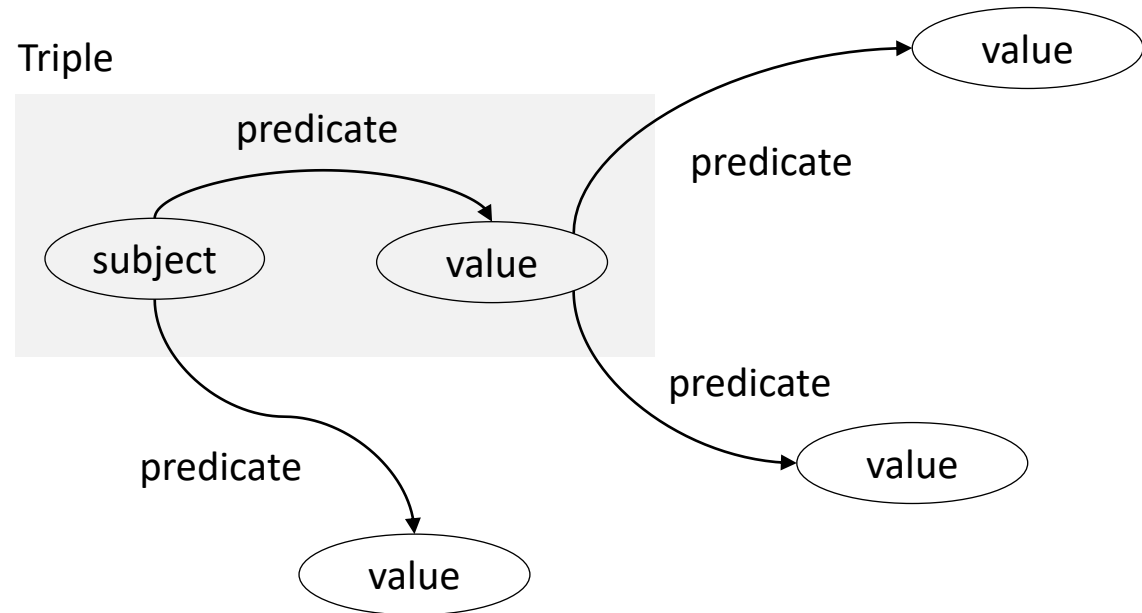


Can you add the following triples to your graph about Plato?
Plato — is a — Philosopher
Plato — has-name — “Plato”

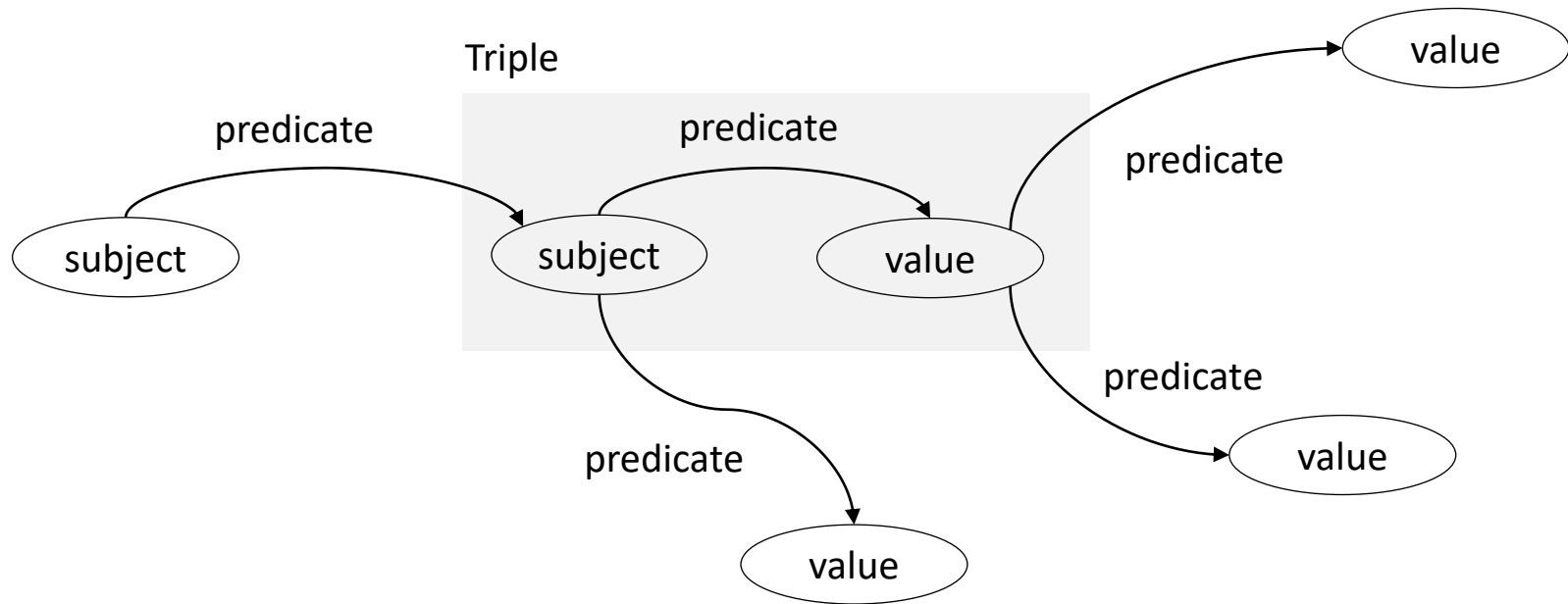
Knowledge Graph?



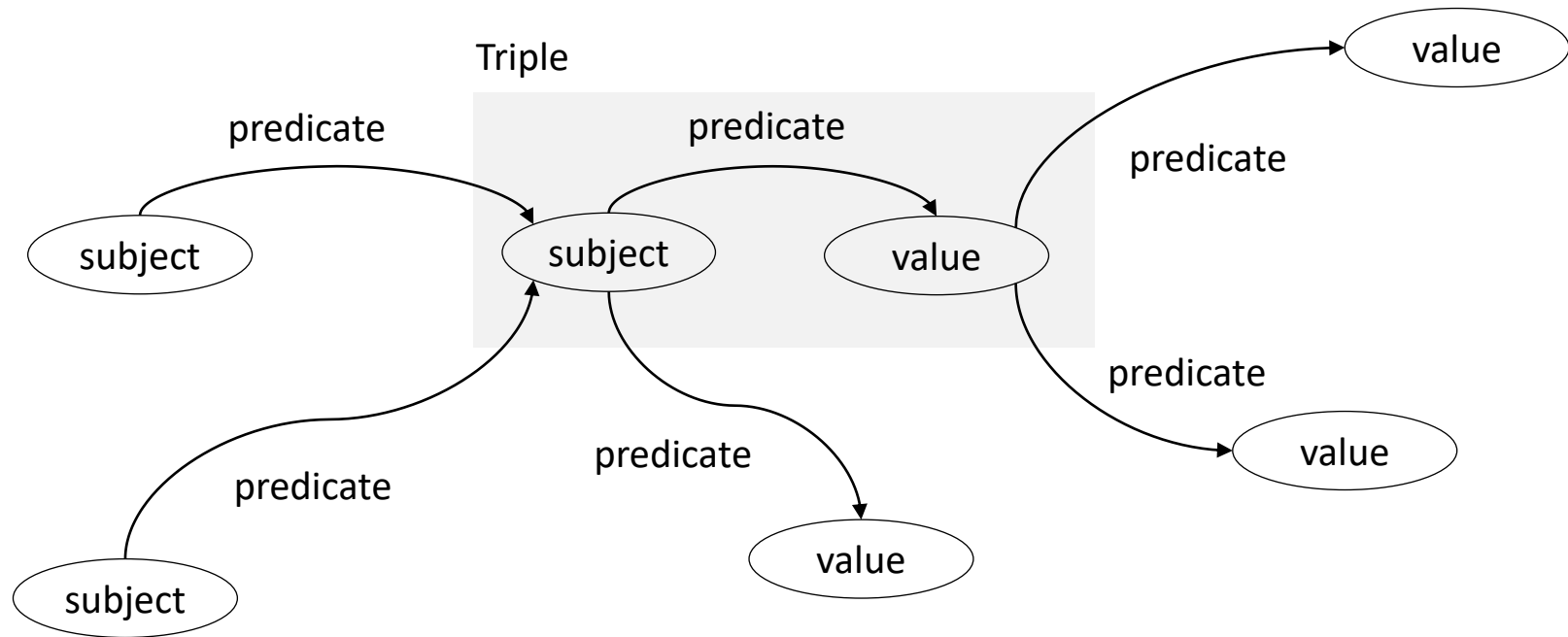
Knowledge Graph?



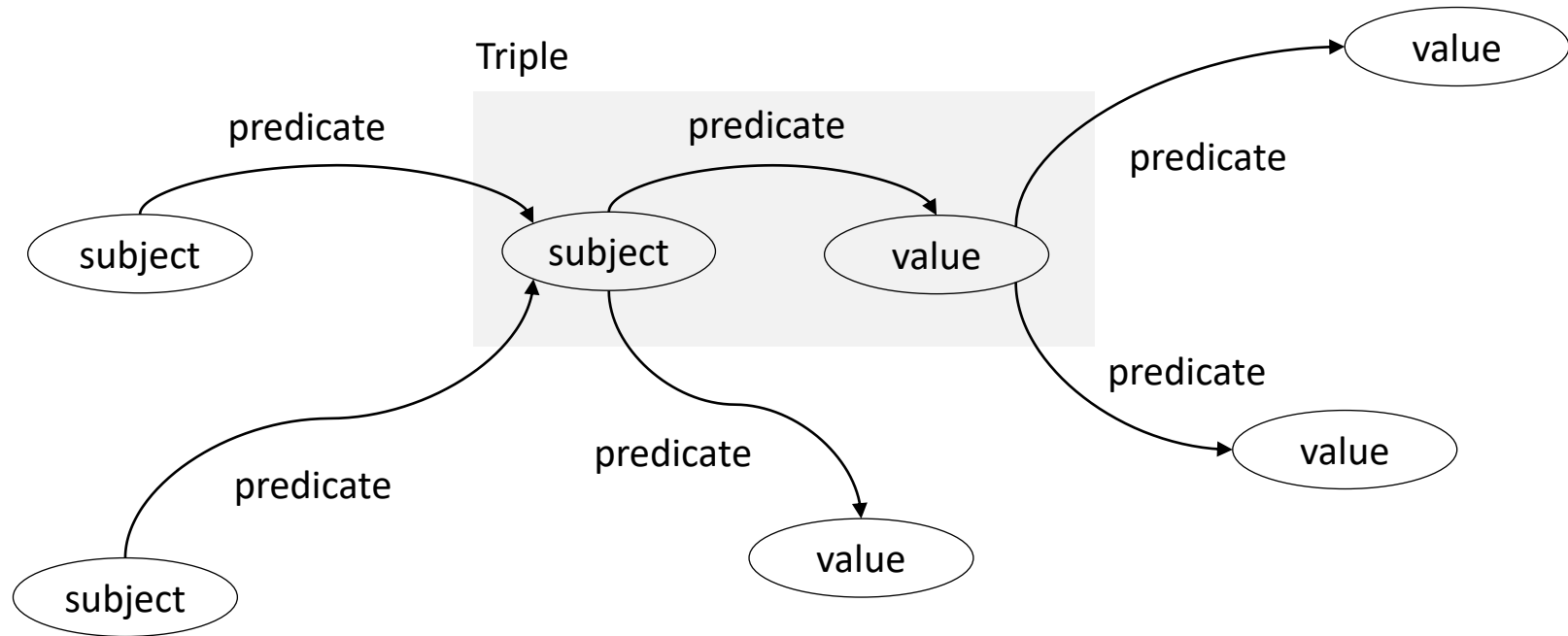
Knowledge Graph?



Knowledge Graph?

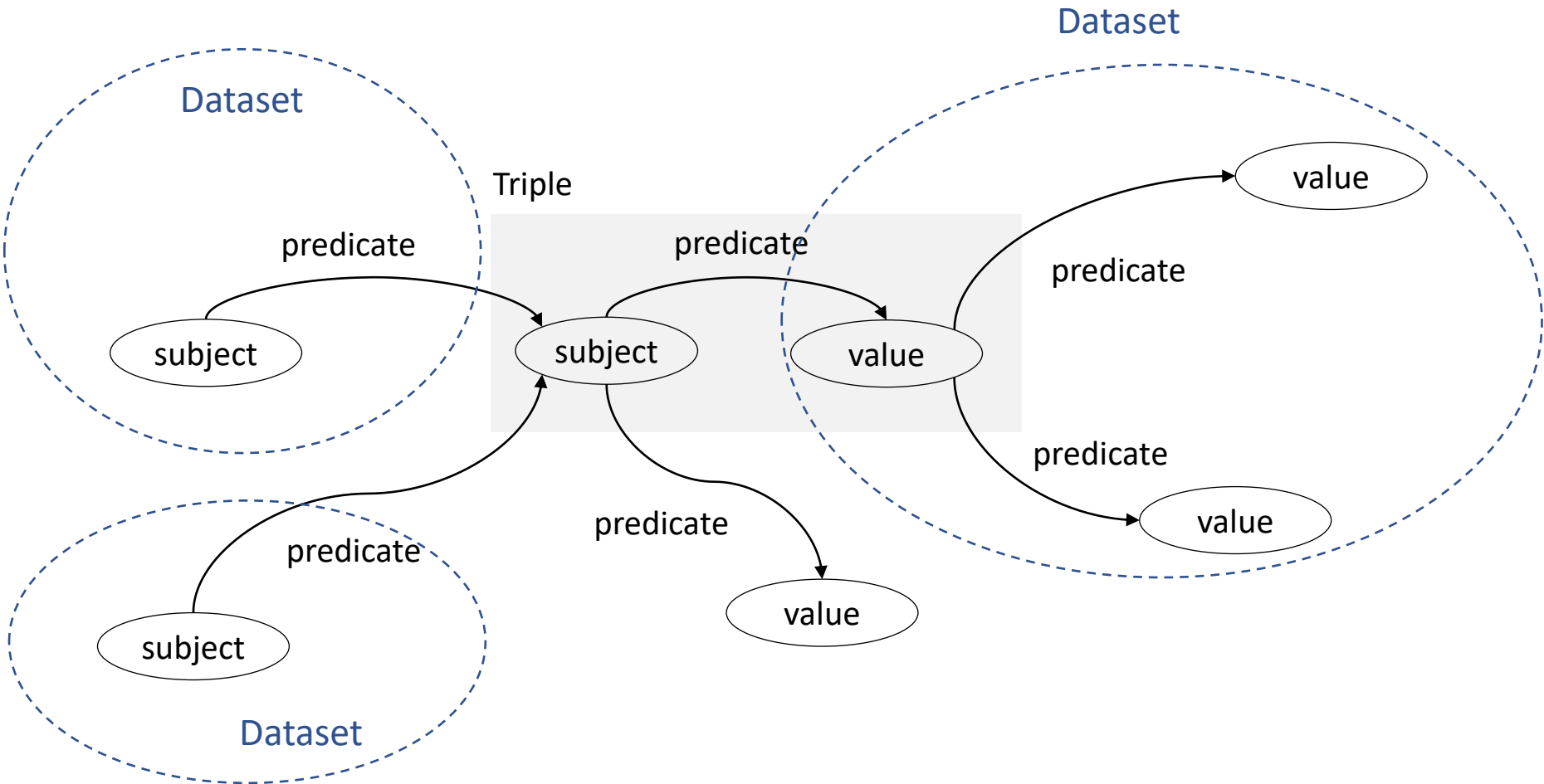


Knowledge Graph?

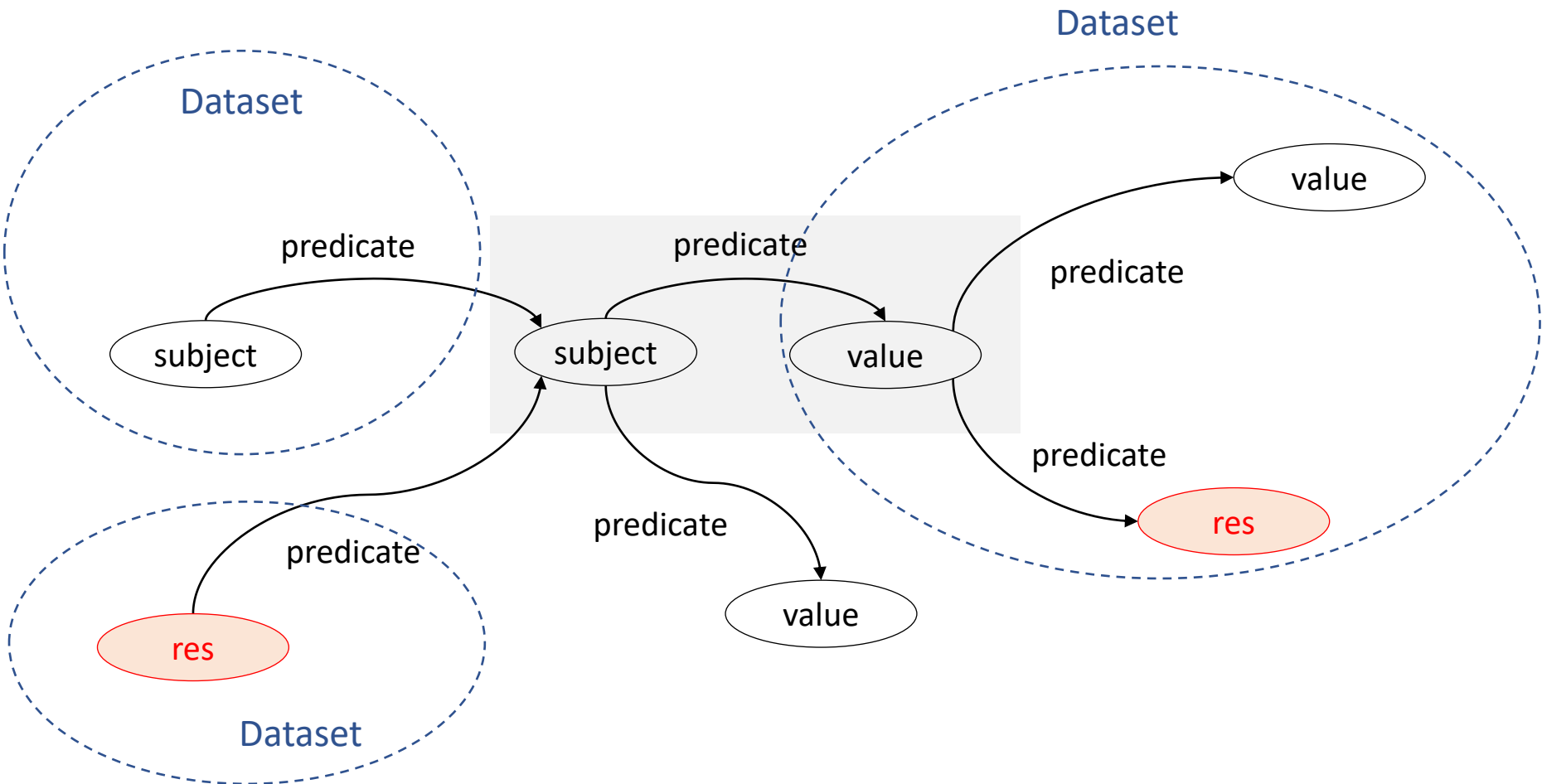


A literal data value (string, number, date, etc.), e.g. name, age, cannot have further properties of its own

Knowledge Graph?

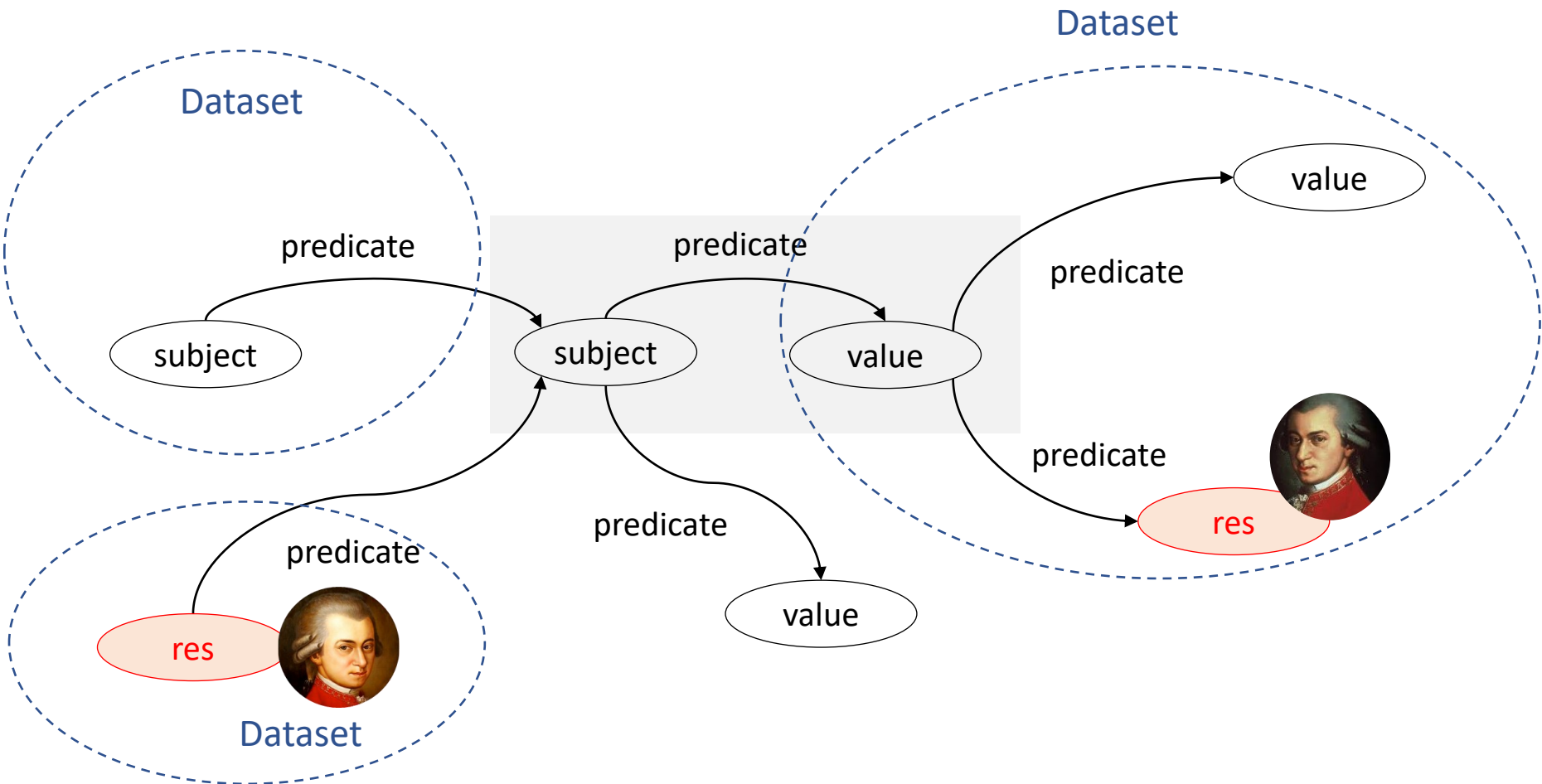


Knowledge Graph?



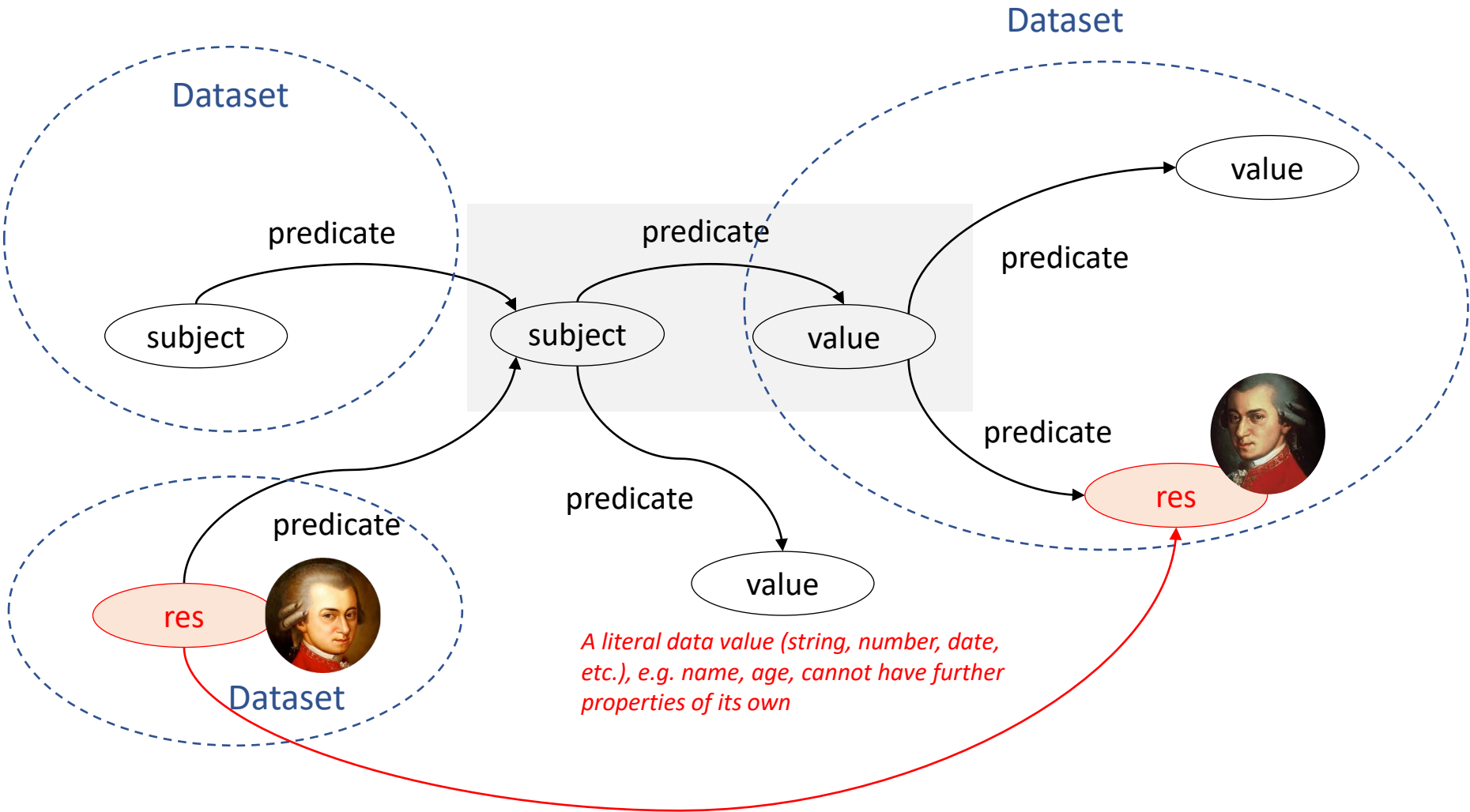
Several copies of the "same" data in different datasets with different URI

Knowledge Graph?



Several copies of the "same" data in different datasets with different URI

Knowledge Graph?



Several copies of the "same" data in different datasets with different URI \Rightarrow Mapping them

*owl:sameAs
skos:closeMatch
skos:broaderMatch , etc.*

Knowledge Graph



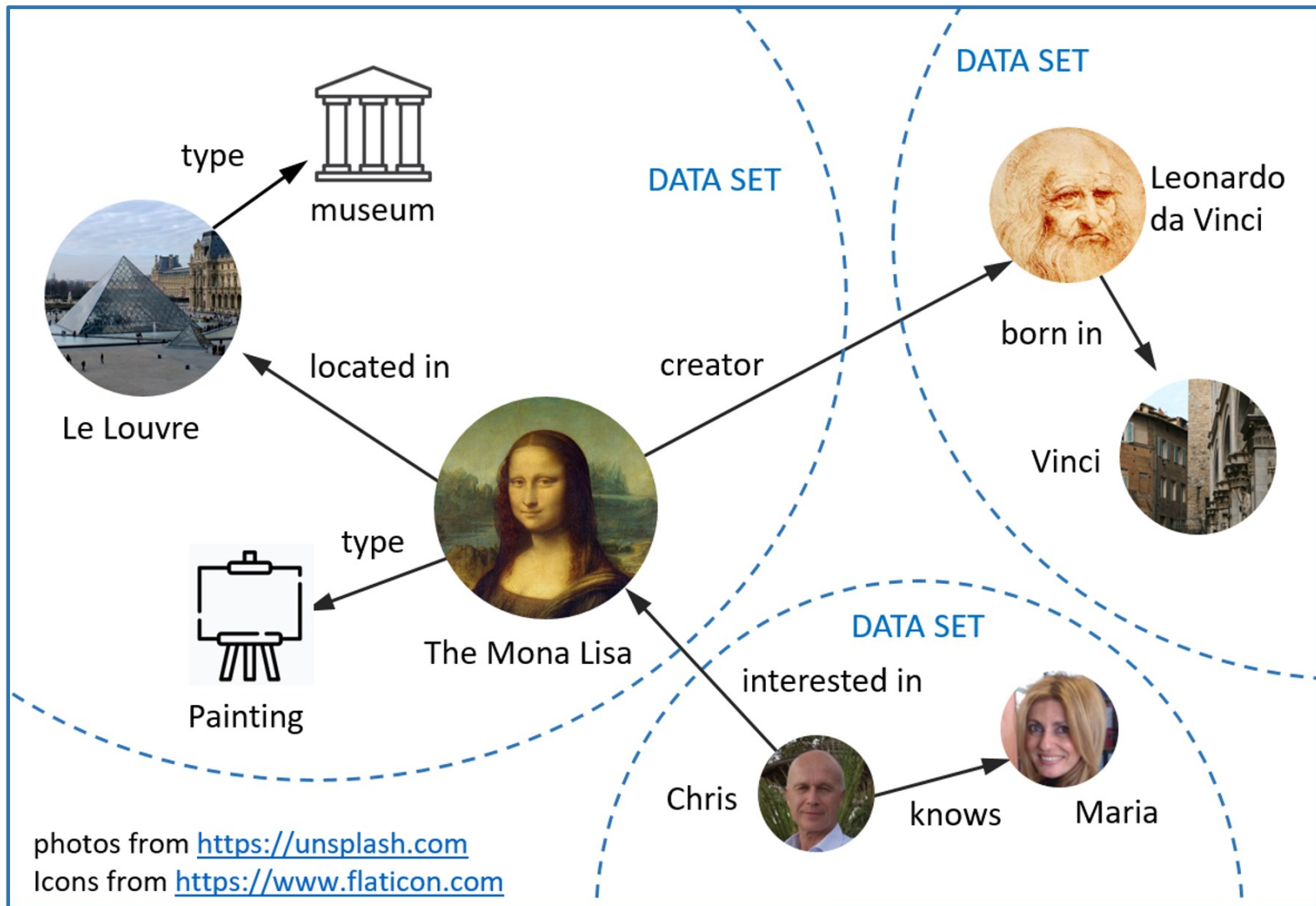
A **knowledge graph** is a **special kind of database** which stores **knowledge in a machine-readable form** and provides a means for information to be collected, organised, shared, searched and utilised.

Main Issues:

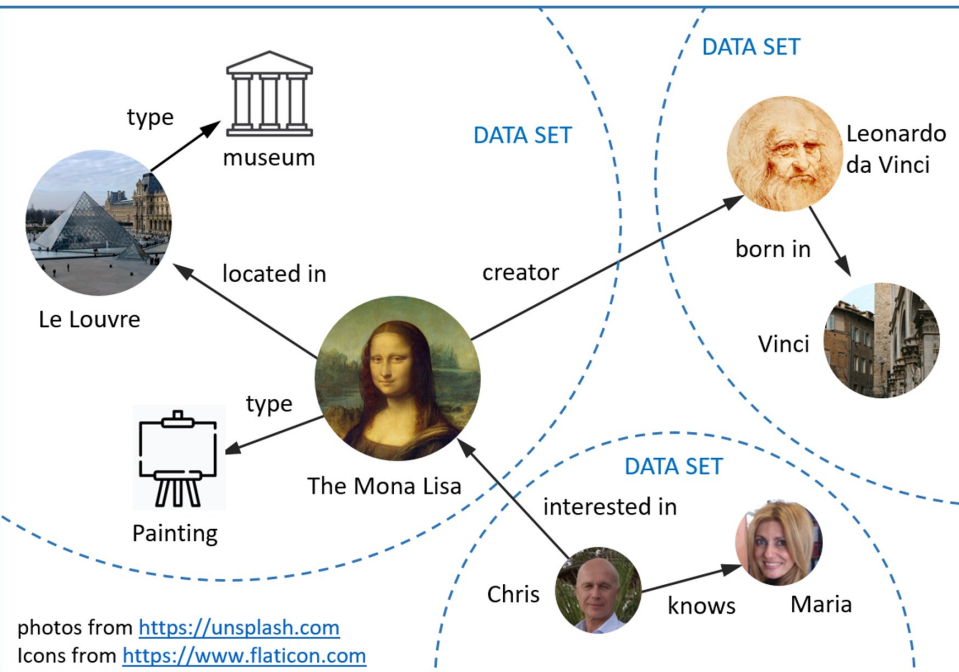
- Representing Data?
- Opening Data?
- Linking Data?
- Searching Data?



Knowledge Graph?



Knowledge Graph?



ANSWER

- The Mona Lisa — type → Painting
- The Mona Lisa — located in → Le Louvre
- Le Louvre — type → museum
- The Mona Lisa — creator → Leonardo da Vinci
- Leonardo da Vinci — born in → Vinci
- Chris — interested in → The Mona Lisa
- Chris — knows → Maria

Each triple exists in a particular dataset visually represented with dashed lines.