

DL Reasoning

Consider the knowledge base made of the following axioms

TBox

Student \subseteq Person

Student \equiv studies **some** Discipline

Professor \subseteq Person

Physics \subseteq Discipline

University \equiv (hasMember **some** Professor) **and** (hasMember **some** Student)

University \subseteq Institution,

University \subseteq hasMember **only** (Professor **or** Student)

Bicycle \subseteq hasOwner **only** Person

ElectricBicycle \subseteq Bicycle

Abox

RDF equivalent

University(UNIGE)

UNIGE rdf:type University

ElectricBicycle(flyer01)

flyer01 rdf:type ElectricBicycle

hasOwner (flyer01, UNIGE)

flyer01 rdf:hasOwner UNIGE

1. What will be the inferred members (if any) of the classes *Bicycle*, *Institution*, and *Person*? Briefly justify your answers.

2. If we add the following axioms to define classes *X*, *Y*, and *Z*, what would be the inferred superclasses of *X*, *Y*, and *Z*? Briefly justify your answers.

X \equiv (hasMember **min** 2 Professor) **and** (hasMember **min** 3 Student)

Y \equiv (hasMember **some** (studies **some** Physics))
and (hasMember **min** 2 Professor)

Z \equiv (hasMember **only** Professor) **or** (hasMember **only** Student)