Mathematical Logics
Description Logic: Introduction

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Lecture index

1. Intuition: the logic of Knowledge Graphs
2. Examples of Knowledge Graphs
3. Two levels in knowledge graphs
4. Description logics
5. The architecture of a DL reasoning system

Two levels in Knowledge graphstoday?

Schema level (schema level KG):

- **Entity types (etypes),** e.g., living organism, animal, cat, person, employee, professor, student, organization, university, company, event, conference, lecture, …
- **Properties**
  - **Attributes (data properties):** <etype, datatype>, e.g., Height: <person, real>, address: <building, string>, timeOf: <lunch, time>
  - **Relations (object properties):** <etype, etype>, e.g., friend: <person, person>, near: <building, bulding>, before: <lunch, dinner>

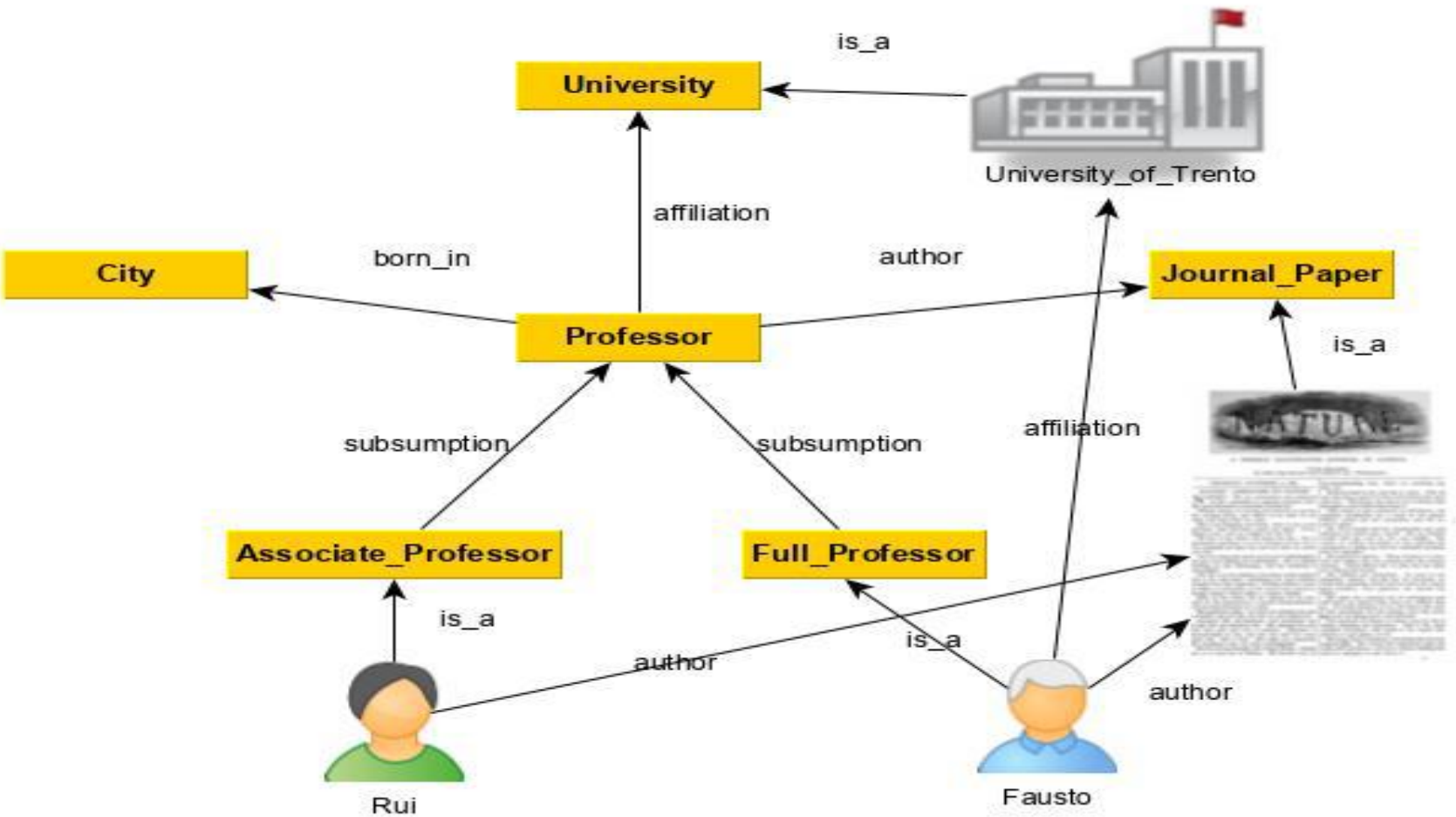
Data level (data level KG based on schema level KG)

- **Entities:** person(Fausto), cat(Garfield), event(lecture.2019/12/02)
- **Property values**
  - **Attribute values: h**eight(Fausto, 176), timeof(lecture.2019/12/02,13.30)
  - **Relation values:** friendOf(Fausto, Mattia), near(Fausto, desk)

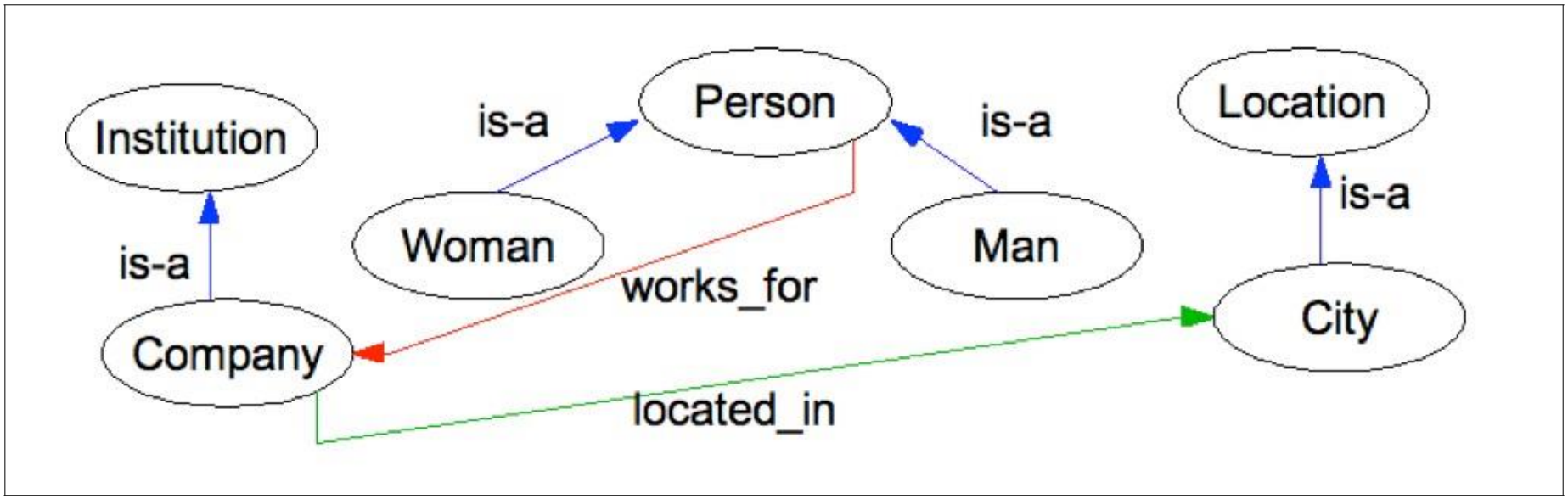
NOTE I: terminology of knowledge graphs

NOTE II: Knowledge Base = Schema level KB + (optionally) Data level KG

Schema and data level Knowledge graph



Schema level KG - example



Exercise 1: populate KG above, bulding data level KG for the above schema level KG

Exercise 2: build schema level and data level KGs of any of the examples before

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