The Exploration Game

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Conceptual Exploration

Ingredients
- a domain (G, M, I), where G: entities, M: properties, I: G × M incidence
  “entity has a statement involving property”
- a domain expert (the player)

Algorithm
- goal: find all valid implications in M:
  \( P \rightarrow C \) “all entities with P also have C”
- compute next best candidate implication
- ask domain expert: is this valid?
  yes: \( \rightarrow \) add implication
  no: \( \rightarrow \) ask for a counter-example
- repeat with the next candidate implication

Overview

The Exploration Game takes you on an interactive journey
to discover new knowledge implicitly present in Wikidata.
By identifying missing and incomplete information, you can
even help with improving Wikidata!

How does it work?

- Frontend: handles domain selection and tracks implications & counter-examples
- Backend: conexp-clj computes implications
- check for counter-examples using SPARQL

An example

1. candidate: “field of work(Laser Science) \( \rightarrow \) award received(Nobel Prize in Physics)”
2. ask player: is this implication valid?
   \( \rightarrow \) yes!
3. candidate: “award received(Nobel Prize in Physics) \( \rightarrow \) field of work(Laser Science)”
4. ask player: is this implication valid?
   \( \rightarrow \) no!
5. ask player for a counter-example:
   \( \rightarrow \) player adds Marie Curie
6. no further candidate implications \( \rightarrow \) game ends

References

- Tom Hanika, Maximilian Marx, Gerd Stumme. Discovering Impicational Knowledge in Wikidata. ICFA 19
- https://github.com/mmax/the-exploration-game/
- Tom Hanika, Johannes Hirth. Conexp-Clj – A Research Tool for FCA. ICFA 19
- https://github.com/tomhanika/conexp-clj/

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Play a round of The Exploration Game
at https://tools.wmflabs.org/teg/