Fully Automatic?
LLM Task Areas

8 billion parameters

https://lastweekin.ai/p/multi-modal-ai
Blog post from Jacky Liang May 01, 2022
Related Work LLM-KG

- **2022 Narayan et al.** “Can Foundation Models Wrangle Your Data?”
  instruction prompts are used with large foundation models (released before the 2023 era, like GPT3) to perform entity matching, error detection, schema matching, data transformation, and data imputation tasks

- **2023 Zhu et al.** “Llms for knowledge graph construction and reasoning: Recent capabilities and future opportunities” investigated the performance of LLMs for KGC w.r.t. entity, relation, and event extraction as well as link prediction, on eight benchmark datasets

- **2023 SPIRES** recursively performs prompt interrogation to directly extract triples from text matching either a provided LinkML schema or identifiers from existing ontologies and vocabularies

- **2023 Olala** feeds textual descriptions of ontology candidate members into an LLM to perform binary or multiple-choice ontology matching decisions.
Related Work LLM-KG

- **2023 AutoAlign** uses LLMs to refine ontology/vocabulary mappings
- **2023 Arora et al.** “Language models enable simple systems for generating structured views of heterogeneous data lakes” A method that generates code using LLMs to create views on heterogeneous data lakes
- **2024 TechGPT-2.0** is a model trained specifically for KGC tasks, including named entity recognition and relationship triple extraction
- **2023 Frey et al.** “Benchmarking the abilities of large language models for RDF knowledge graph creation and comprehension: How well do llms speak turtle?”, “Assessing the evolution of llm capabilities for knowledge graph engineering in 2023” investigates KG engineering tasks, RDF querying, and generation
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**costly: resources, time, money ⇒ configure existing tools (interfaces)**
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- **2024 Ontogenix & R2[RML]-ChatGPT** recent effort to generate ontologies and RML mappings
Towards self-configuring Knowledge Graph Construction - A Case Study with RML

Marvin Hofer, Johannes Frey, Erhard Rahm
Experiment Method and Setup

1. Test Data & Prompt Input Data
2. Target Ontology
3. RML Mapping Requirements & Challenges
4. LLM Instructions
Finding a fitting Domain and Data
Test Data & Prompt Input Data

- **IMDB movie data**, describes **films** (creative works) and **involved people**
- Includes **properties** for films like **year**, **name**, **genre**, **episode**
- and **relations** to persons (job categories): **actor**, **writer**, **editor**, **producer**, **director**
- Available as **6 CSV dumps** [https://developer.imdb.com/non-commercial-datasets/]
Test Data & Prompt Input Data

- IMDB movie data, describes **films** (creative works) and **involved people**
- Includes **properties** for films like **year, name, genre, episode**
- and **relations** to persons (job categories): **actor, writer, editor, producer, director**

- Representing the data for a single film and related people as **single JSON object instead of multiple tables**
  - wide table is difficult and introduces cell redundancy
  - supports simple **datatypes** (**numbers, strings, booleans**)
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- Representing the data for a single film and related people as a single **JSON object instead of multiple tables**
  - wide table is difficult and introduces cell redundancy
  - supports simple **datatypes** (**numbers, strings, booleans**)

  **choosing one film entry**
  - "**Diamonds**" covers all job categories
Snippet of Input Data and Expected RDF Graph

```json
{
  "id": "tt0167423",
  "originalTitle": "Diamonds",
  "runtimeMinutes": 91,
  "startYear": 1999,
  "genre": ["Comedy", "Mistery"],
  "titleTyp": "movie",
  "isAdult": 0,
  "involvedPeople": [{
    "id": "nm0000018",
    "ordering": 1,
    "name": "Kirk Douglas",
    "birthYear": 1916,
    "deathYear": 2020,
    "category": "actor"
  }, ...]
}
```

```sparql
@prefix ...
@base <http://mykg.org/resource/>

"tt0167423" a dbo:Film;
  dbo:title "Diamonds";
  dbo:genre "Comedy", "Mistery";
  dbo:startYear "1999"^^xsd:gYear;
  dbo:Work/runtime "91"^^dtd:minute;
  dbo:starring <nm0000018>, ...
  dbo:director <nm0038875>;
  ...

<nm0000018> a dbo:Person, dbo:Actor;
  dbo:name "Kirk Douglas";
  dbo:birthYear "1916"^^xsd:gYear;
  dbo:deathYear "2020"^^xsd:gYear.
  ...
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dbo:starring <nm0000018> , ... ; 
dbo:director <nm0038875> ; 
... 
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```turtle
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  dbo:starring <nm0000018> , ... ;
  dbo:director <nm0038875> ;
  ... 
  <nm0000018> a dbo:Person , dbo:Actor ;
  dbo:name "Kirk Douglas" ;
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  ...
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```
Towards self-configuring Knowledge Graph Construction // KGC@ESWC24 // Greece

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    "titleTyp": "movie",
    "isAdult": 0,
    "involvedPeople": [{
        "id": "nm000000018",
        "ordering": 1,
        "name": "Kirk Douglas",
        "birthYear": 1916,
        "deathYear": 2020,
        "category": "actor"
    }, ...]
}
```

63 - Triples
11 - Entities
2 - Entity Types
15 - Relation Types

```
@prefix ... 
@base <http://mykg.org/resource/>
<tt0167423> a dbo:Film ;
 dbo:title "Diamonds" ;
 dbo:genre "Comedy", "Mistery" ;
 dbo:startYear "1999"^^xsd:gYear ;
 dbo:Work/runtime "91"^^dtd:minute ;
 dbo:starring <nm000000018>, ... ;
 dbo:director <nm0038875>; ...

<nm000000018> a dbo:Person , dbo:Actor ;
 dbo:name "Kirk Douglas" ;
 dbo:birthYear "1916"^^xsd:gYear ;
 dbo:deathYear "2020"^^xsd:gYear . ...
```
Ontology Development

- Serves the **purpose to check whether the LLms are capable** of using it correctly
- Selected as a **subset of the existing DBpedia ontology** from over 1.3K Classes, 50K Properties
- Including **sub class, sub property, labels, and comments** properties
- Represented in **RDF Turtle format** using rdfs and owl vocabulary
Ontology Development

- **Entity Types**: Person > Actor, Work > Film, (VideoGame)

- **Datatype Properties**: runtime (Work/runtime), birthYear, deathYear, genre, name, originalTitle, startYear, title

- **Object Properties**: rdf:type, composer, director, editing, executiveProducer, starring, writer (editor, producer, profession)

- **Not Mapped**: isAdult & ordering
Confusable Properties

dbo:runtime a owl:DatatypeProperty;
  rdfs:label "runtime (s)";
  rdfs:range xsd:double;
  rdfs:domain dbo:Work .

<http://dbpedia.org/ontology/Work/runtime> a
owl:DatatypeProperty;
  rdfs:label "runtime (m)";
  rdfs:range
<https://dbpedia.org/datatype/minute> ;
  rdfs:domain dbo:Work .

<https://dbpedia.org/datatype/minute> a
owl:Datatype;
  rdfs:label "minute" .

dbo:editor a owl:ObjectProperty;
  rdfs:label "editor" , "redaktor"@pl , "Herausgeber"@de ;
  rdfs:range dbo:Agent;
  rdfs:subPropertyOf dul:coparticipatesWith .

dbo:editing a owl:ObjectProperty;
  rdfs:label "editing" ;
  rdfs:range dbo:Person;
  rdfs:domain dbo:Film;
  rdfs:subPropertyOf dul:coparticipatesWith .

dbo:genre a owl:DatatypeProperty ; #owl:ObjectProperty
  rdfs:label "genre" ;
  rdfs:range rdf:langString ;
  rdfs:domain dbo:Work .
Confusable Properties

dbo:runtime a owl:DatatypeProperty ;
   rdfs:label "runtime (s)" ;
   rdfs:range xsd:double ;
   rdfs:domain dbo:Work .

<http://dbpedia.org/ontology/Work/runtime> a
owl:DatatypeProperty ;
   rdfs:label "runtime (m)" ;
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   rdfs:domain dbo:Work .

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Confusable Properties

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<http://dbpedia.org/ontology/Work/runtime> a
    owl:DatatypeProperty ;
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Prompt Engineering

- Started with a single simple prompts

- “Generate an RML mapping in Turtle for the given JSON to the given RDF Ontology”

- Adapted the prompt by adding further instructions based on observed issues

- Two final prompts
  1. RML Generation Prompt
  2. RDF Repair Prompt
RML Generation Prompt

You are a helpful assistant that provides full RML mappings in RDF turtle format that aim to convert a full JSON input file source (assume filename /path/to/input.json) into RDF using the provided DBpedia movie ontology as mapping target.

You will be given a representative sample from the input source in order to derive generic information for the schema of the file. Map information as fine-grained as possible w.r.t. the target ontology, by identifying the best matches for classes, properties and only use more generic (coarse-grained) classes/properties from the target ontology when there are no better matches. Only create mappings to classes or properties defined by the given target ontology. Take the domain and range definitions of properties into account and use RML (builtin only) transformation functions to convert input according to the expected output datatype whenever necessary and possible. You shall use information about domain and ranges from the given target ontology. Make sure the mapping is syntactically and semantically correct to the RML specification or RML ontology such that it can be automatically processed. Use the http://mykg.org/resource/ namespace for creating the subject IRIs.

{ONTOMETRY TURTLE}

{JSON INPUT}
RML Generation Prompt

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You will be given a representative sample from the input source in order to derive generic information for the schema of the file. Map information with the most specific class or property possible. Take the domain and range of properties into account. Use the provided movie ontology as a mapping target. Convert given JSON data with file source located at /path/to/input.json. Map information with the most specific class or property possible. Take the domain and range of properties into account. (Convert values to be valid for datatypes) Ensure syntactic and semantic correctness to RML specification. Use 'http://mykg.org/resource/' as target namespace.

{ONTOLOGY TURTLE}

{JSON INPUT}
RDF Repair Prompt

You are a helpful assistant that repairs broken RDF Turtle syntax, given as input by the user. Stick with the original structure and formatting of the file as much as possible. Try to fix it with minor modifications of single character or symbols, especially do not remove any lines and triples unless there is no syntax fix possible, and also do not add information to the file, that was not stated before. Please take care that the file has proper usage of the comma, semicolon, and dot symbols in the turtle syntax: According to the W3C RDF 1.1 Turtle Terse RDF Triple Language specification the ';' symbol is used to repeat the same subject for triples that vary only in predicate and object RDF terms, only use '.' when defining a new subject in the next triple. The same applies when using ']' notation, append '.' when defining a new subject in the subsequent triple. The ',' is is used to enumerate multiple object for the same subject-predicate pair. Also take the given parsing exception or error message into account, but in some cases they might be misleading. Please respond with the full fixed RDF Turtle document, including all necessary prefix declarations.

{ERROR MSG}

{INVALID RDF}
RDF Repair Prompt

You are a helpful assistant that repairs broken RDF Turtle syntax, given as input by the user.

Stick with the original structure and formatting of the file as much as possible. Try to fix it with minor modifications of single characters, symbols, or punctuation as much as possible, and also apply the proper usage of the comma ',', semicolon ';', and dot '.' symbols according to the W3C RDF 1.1 Turtle Terse RDF Triple Language specification. For repeated triples that vary only in predicate or object RDF terms, use ';' symbol to repeat the same subject for triples that vary in only the predicate and object terms. Use '.' only when defining a new subject in the next triple. The same applies when using '[]' notation. Append '.' when defining a new subject in the subsequent triple. Use ',' to enumerate multiple objects for the same subject-predicate pair. Also take the given parsing exception or error message into account, but in some cases they might be misleading.

- Respond with the full fixed RDF Turtle document.
- Stick with the original structure and formatting of the original Turtle file as much as possible.
- Only apply minor modifications to fix the syntax.
- Take the given parsing exception into account when repairing.
- Check proper usage of ,.; for separating triples, predicate-objects, and objects.

{ERROR MSG}

{INVALID RDF}
RML Mapping Requirements & Challenges
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- defining correct **logical source** based on given file path
RML Mapping Requirements & Challenges

- defining correct **logical source** based on given file path

- **mapping all** JSON attributes where a target property (candidate) **exists in the ontology** but not mapping keys without a candidate (ontology coverage & succinctness)
RML Mapping Requirements & Challenges

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- following a specified **pattern for entity IRIs** incorporating their IDs
- (usage of RML-Mapper **built-in functions only**)
Evaluation Setup
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40 runs for each Model (Claude 2.1 / 3.0, GPT 3.5 / 4 Turbo, Gemini Pro)
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3. Then verify the correctness of these triples,
4. Finally, we assess if correctly mapped to the target ontology

Diagram:

- Input data JSON Sample
  - RML Mapping Generation Prompting
    - LLM response
      - Valid Turtle Syntax
        - RML mapping candidate file
          - Mapping Execution
            - Constructed RDF Graph
      - Turtle Repair Prompting (no)

Towards self-configuring Knowledge Graph Construction // KGC@ESWC24 // Greece
Evaluation LLM Response Validity

RDF Turtle Syntax Validity

Mapping Soundness (how valid is declaration)
Evaluation LLM Response Validity

RDF Turtle Syntax Validity

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<td>1</td>
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<tr>
<td>2</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>24</td>
</tr>
</tbody>
</table>

Mapping Soundness (how valid is declaration)

<table>
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<tr>
<th>#RML Executions</th>
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</thead>
<tbody>
<tr>
<td>0 repair attempts needed</td>
</tr>
<tr>
<td>26</td>
</tr>
<tr>
<td>13</td>
</tr>
</tbody>
</table>

rr:template
"...mykg.org/.../${.involvedPeople[?(@.category==’editor’)].id}"
Evaluation LLM Response Validity

<table>
<thead>
<tr>
<th>LLM</th>
<th>RDF Turtle Syntax Validity</th>
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</table>
Simple query-based evaluation
## Simple query-based evaluation

<table>
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<tr>
<th>Category</th>
<th>Claude 3</th>
<th>Gpt 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mappings with triples</td>
<td>26 (100%)</td>
<td>13 (100%)</td>
</tr>
<tr>
<td>All <strong>people</strong> entities have IRI containing <strong>correct ID field</strong></td>
<td>21 (80%)</td>
<td>9 (70%)</td>
</tr>
<tr>
<td>All <strong>people</strong> IRIs are <strong>typed</strong></td>
<td>20 (77%)</td>
<td>7 (54%)</td>
</tr>
<tr>
<td>All <strong>actors</strong> entities have IRI containing <strong>correct ID field</strong></td>
<td>21 (80%)</td>
<td>9 (70%)</td>
</tr>
<tr>
<td>All <strong>actor</strong> IDs are <strong>typed</strong></td>
<td>11 (42%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Full predicate coverage</td>
<td>4 (15%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td><strong>Only ontology</strong> mapped</td>
<td>20 (77%)</td>
<td>2 (15%)</td>
</tr>
<tr>
<td>isAdult or ordering <strong>not mapped</strong></td>
<td>26 (100%)</td>
<td>13 (100%)</td>
</tr>
<tr>
<td>Usage of <strong>any / custom function</strong></td>
<td>0/0 (-)</td>
<td>3/3 (-)</td>
</tr>
</tbody>
</table>

⇒ At first glance, Claude 3 outperforms GPT 4
Triple Exact Match Comparison

- Very strict set of scores that report 4 graph identity measures
  - triples, subject IRIs, predicate IRIs, object IRIs/Literals
- F1 scores are calculated based on generated, correct, and reference sets

<> rdf:type <http://dbpedia.org/ontology/Actor> .
<> dbo:birthYear “1900”^^xsd:gYear .
Triple Exact Match Comparison
Exact Triple match is below 0.2
Triple Exact Match Comparison

- Exact Triple match is below 0.2
- Most mismatches for Subject IRIs
Towards self-configuring Knowledge Graph Construction // KGC@ESWC24 // Greece

Triple Exact Match Comparison

- Exact Triple match is below 0.2
- Most mismatches for Subject IRIs
- Claude 3 reaches F1 mean of around 0.75 for predicate and object match
Towards self-configuring Knowledge Graph Construction // KGC@ESWC24 // Greece

- Exact Triple match is below 0.2
- Most mismatches for Subject IRIs
- Claude 3 reaches F1 mean of arrouch 0.75 for predicate and object match
- Claude 3 again better than GPT 4
Relaxed Scores

1 Film
10 Persons
4 Actors

“1916”^^xsd:gYear.
“1916”^^xsd:date.
“2020”^^xsd:gYear.
Relaxed Scores

- Much better scores than Strict Exact Measures

- Example data:
  - E-ID: `<mykg.org/id/t1000>`
  - E-Type: `<mykg.org/*t1000*>`
  - Value: "1916"^^xsd:gYear
  - Datatype: "1916"^^xsd:date, "2020"^^xsd:gYear

- Graphs showing distributions for E-ID, E-Type, Value, and Datatype.
Relaxed Scores

- Much better scores than Strict Exact Measures
- E-ID score (relaxed Subject IRI) is almost 1 for Claude 3
Relaxed Scores

- Much better scores than Strict Exact Measures
- E-ID score (relaxed Subject IRI) is almost 1 for Claude 3
- GPT 4 has more trouble with Literal mappings than Claude 3 (for both parts, the value and datatype)
Property Mappings Insights
Property Mappings Insights

For each predicate/property and per generated RML declaration / document
Property Mappings Insights

For each predicate/property and per generated RML declaration / document

- “property is used” number of triples containing this property
Property Mappings Insights

For each predicate/property and per generated RML declaration / document

- "property is used" number of triples containing this property
- "property outdegree is OK" is mapped the expected number of times
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For each predicate/property and per generated RML declaration / document

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- "property outdegress is OK" is mapped the expected number of times
- "subject (fuzzy) is OK" mapped for the right (subject entity) relation
Property Mappings Insights

For each predicate/property and per generated RML declaration / document

- “**property is used**” number of triples containing this property
- “**property outdegree is OK**” is mapped the expected number of times
- “**subject (fuzzy) is OK**” mapped for the right (subject entity) relation
- “**object is IRI**” is mapped as a object property (points to another entity)
Property Mappings Insights

For each predicate/property and per generated RML declaration / document

- “property is used” number of triples containing this property
- “property outdegree is OK” is mapped the expected number of times
- “subject (fuzzy) is OK” mapped for the right (subject entity) relation
- “object is IRI” is mapped as a object property (points to another entity)
- “object is Literal” is mapped as a datatype property (points to a literal)
Property Mappings Insights

For each predicate/property and per generated RML declaration / document

- **“property is used”** number of triples containing this property
- **“property outdegrees is OK”** is mapped the expected number of times
- **“subject (fuzzy) is OK”** mapped for the right (subject entity) relation
- **“object is IRI”** is mapped as a object property (points to another entity)
- **“object is Literal”** is mapped as a datatype property (points to a literal)
- **“object Datatype is OK”** literal has the correct datatype
### Object Property Mappings

**rr:template**

```
"...mykg.org/.../{$.involvedPeople[?
(@.category=='editor').id]"```

<table>
<thead>
<tr>
<th>rdf:type</th>
<th>composer</th>
<th>director</th>
<th>editing</th>
<th>starring</th>
<th>executiveProducer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
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<th>6</th>
<th>6</th>
<th>5</th>
<th>0</th>
<th>7</th>
<th>6</th>
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<td>p is used</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p fecq. OK</td>
<td></td>
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<td></td>
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<tr>
<td>o fuzzy OK</td>
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<tr>
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<td>6</td>
<td>5</td>
<td>0</td>
<td>7</td>
<td>6</td>
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</table>

**Claude 3**

<table>
<thead>
<tr>
<th></th>
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<th>1</th>
<th>3</th>
<th>0</th>
<th>0</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>p is used</td>
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<td></td>
<td></td>
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<tr>
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<tr>
<td>o is Object</td>
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<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
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</table>

**GPT 4**

<table>
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<th>2</th>
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<tbody>
<tr>
<td>p is used</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p fecq. OK</td>
<td></td>
<td></td>
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<td>o fuzzy OK</td>
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<tr>
<td>o is Object</td>
<td>13</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Object Property Mappings

- Both models fail to generate correct mapping rules for all job function object properties

---

```
rr:template
"...mykg.org/.../{$.involvedPeople[?
@.category=='editor'].id}"
```

<table>
<thead>
<tr>
<th>Model</th>
<th>rdf:type</th>
<th>composer</th>
<th>director</th>
<th>editing</th>
<th>executiveProducer</th>
<th>starring</th>
<th>writer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claude 3</td>
<td>26</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>GPT 4</td>
<td>13</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**p is used**

**p fecq. OK**

**o fuzzy OK**

**o is Object**
Object Property Mappings

- Both models fail to generate correct mapping rules for all *job function* object properties
- Claude-3 and GPT-4 do not map the hard property *executiveProducer*

```
rr:template
"...mykg.org/.../{$.involvedPeople[?
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```

<table>
<thead>
<tr>
<th>rdf:type</th>
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<th>director</th>
<th>editing</th>
<th>executiveProducer</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Claude 3

<table>
<thead>
<tr>
<th>p is used</th>
<th>p fecq. OK</th>
<th>o fuzzy OK</th>
<th>o is Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

GPT 4

<table>
<thead>
<tr>
<th>p is used</th>
<th>p fecq. OK</th>
<th>o fuzzy OK</th>
<th>o is Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Object Property Mappings

- Both models fail to generate correct mapping rules for all *job function* object properties
- Claude-3 and GPT-4 do not map the hard property *executiveProducer*
- Claude-3 RML mappings use the expected target property *editing* five times, but incorrectly

```
rr:template
"...mykg.org/.../{$.involvedPeople[
?(@.category=='editor').id]"```
## Object Property Mappings

- Both models fail to generate correct mapping rules for all *job function* object properties.
- Claude-3 and GPT-4 do not map the hard property `executiveProducer`.
- Claude-3 RML mappings use the expected target property `editing` five times, but incorrectly.
- GPT-4’s mapping results do not contain a single triple using the property `editing`.

### Claude-3 RML Mappings

<table>
<thead>
<tr>
<th>p is used</th>
<th>p fecq. OK</th>
<th>o fuzzy OK</th>
<th>o is Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>5</td>
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</tr>
<tr>
<td></td>
<td>7</td>
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</tr>
<tr>
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</tbody>
</table>

### GPT-4 Mapping Results

<table>
<thead>
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<th>p fecq. OK</th>
<th>o fuzzy OK</th>
<th>o is Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
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<td>3</td>
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</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
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<td>2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

```
rr:template
"...mykg.org/.../{$.involvedPeople[?
(?@.category='editor').id]"```
## Datatype Property Mapping

<table>
<thead>
<tr>
<th></th>
<th>Work/runtime</th>
<th>birthYear</th>
<th>deathYear</th>
<th>genre</th>
<th>name</th>
<th>originalTitle</th>
<th>startYear</th>
</tr>
</thead>
<tbody>
<tr>
<td>p is used</td>
<td>24 25 25</td>
<td>22 23 25</td>
<td>25 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p fecq. OK</td>
<td>24 22 22</td>
<td>22 20 25</td>
<td>25 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o is Object</td>
<td>0 0 0</td>
<td>1 1 1</td>
<td>0 0 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p is Literal</td>
<td>24 25 25</td>
<td>21 22 24</td>
<td>25 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>datatype OK</td>
<td>19 21 21</td>
<td>18 20 21</td>
<td>21 21</td>
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</tbody>
</table>

### Claude 3

<table>
<thead>
<tr>
<th></th>
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<th>p fecq. OK</th>
<th>o is Object</th>
<th>p is Literal</th>
<th>datatype OK</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>9 10 11</td>
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<td>10</td>
<td>8 9 10</td>
</tr>
</tbody>
</table>
Datatype Property Mapping

- Genre property used as object property once in each model result:

<table>
<thead>
<tr>
<th>p is used</th>
<th>WorkRun Time</th>
<th>birthYear</th>
<th>deathYear</th>
<th>genre</th>
<th>name</th>
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<th>startYear</th>
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<tbody>
<tr>
<td></td>
<td>24 25 25 22 23 25 25</td>
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<tr>
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</tr>
<tr>
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<td>19 21 21 18 20 21 21</td>
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Claude 3

<table>
<thead>
<tr>
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<th>GPT 4</th>
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<tr>
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<tr>
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<td>0 8 8 10 8 9 10</td>
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</tbody>
</table>
### Datatype Property Mapping

- Genre property used as object property once in each model result:
  - Contrasts with changes made in our ontology

<table>
<thead>
<tr>
<th></th>
<th>Work/runtime</th>
<th>birthYear</th>
<th>deathYear</th>
<th>genre</th>
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Claude 3

<table>
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<td>10</td>
<td>8</td>
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</tr>
</tbody>
</table>

GPT 4
**Datatype Property Mapping**

- Genre property used as object property once in each model result:
  - Contrasts with changes made in our ontology
  - Differs from the original definition in the DBpedia ontology (as Object Property)

<table>
<thead>
<tr>
<th></th>
<th>Work-runtime</th>
<th>birthYear</th>
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Datatype Property Mapping

- Genre property used as object property once in each model result:
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  - Differs from the original definition in the DBpedia ontology (as Object Property)
- GPT4 only uses Work/runtime once, but incorrectly

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Claude 3

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GPT 4
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  - Differs from the original definition in the DBpedia ontology (as Object Property)
- GPT4 only uses Work/runtime once, but incorrectly
- Otherwise good mapping quality
## Incorrect Property Usage

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**GPT 4**
Incorrect Property Usage

- A mapping for the (wrong) property editor was generated once by both models.
Incorrect Property Usage

- A mapping for the (wrong) property editor was generated once by both models
- The (wrong) producer property was mapped

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- A mapping for the (wrong) property editor was generated once by both models.
- The (wrong) producer property was mapped six times by Claude-3.

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Conclusion
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Thank You!

Contact:
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