Knowledge Graphs with Large Language Models

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Assignment 3: Knowledge Graph Population

Introduction

Having specified the schema of your knowledge graph, your next step is to populate it with entities and relations. Because you don't have a lot of time and resources to develop full-fledged population pipelines, you focus on showcasing how such a pipeline could be developed for a small part of the graph.

Tasks

Task 1 (40%): Develop an entity extractor

Select two classes from your graph's schema whose instances you typically expect to find in textual resources, and develop an LLM-based entity extractor that can extract them.

System requirements and limitations:

- The system should take as input one or more texts and output distinct terms that can be considered as instances of either of these two classes.
- The system should not output terms that do not exist in the input texts.
- The system does not need to identify which of the terms are synonyms with each other.
- The system's output should be easily reviewable by humans; this means that a human judge should have enough information to judge if the extracted terms are correct or not.
- You don't have enough data nor resources to fine-tune the LLM

Task 2 (30%): Evaluate the entity extractor

Create a small evaluation dataset that consists of 10-15 texts, along with the distinct terms that they contain and which are instances of either of your two target classes. Then use this dataset to measure the precision and recall of your extractor. The texts should come from real-world documents (your own or online).

Task 3 (30%): Develop and evaluate an LLM evaluator for your entity extractor

Develop an LLM-as-a-judge system that will take as input the output of the entity extractor and will judge its correctness. Evaluate this system in terms of agreement with human judgments.

Deliverables

- An implementation of your extractors and evaluators, either in the form of a Colab notebook or any other way you prefer, with clear instructions on how to run it .
- A file with the dataset for task 2
- A report describing the development process of the systems as well as their evaluation results.

Important notice

You are allowed to use an LLM to help you with the above tasks. However, if you do that, you need to be critical against the suggestions that the LLM might give you and correct/adapt them as needed. **Remember that you are solely responsible for the end result.**