NLP CS6320 Homework 4

Due April 24, 23:59
30 points

Please go through the tasks below and take screenshots. Submit your RDF/json files and a document with the screenshots.
Feel free to use GPT to help you with syntax.
Story:
John has a sister Jane. Jane has an older brother Mark. Jane is 21 years old.
Problems:

1. (10 points) Represent main classes, instances and relations from the story in RDF/OWL using Protege. Find 2 possible facts that can be inferred from the text - consider family relations and age restrictions for drinking, marrying, etc. Write axioms in Protege to make the inference.

   Save inferred axioms - File - export inferred axioms as ontology
   Hint. When using the reasoner, use a little checkbox in the bottom right of the Protege window to display inferred facts.

1. (10 points) Using **one** of the RDF tools listed below, load the RDF into the graph. Come up with a question to the story, and write a SPARQL query that answers the question.

   Options:

   - GraphDB (some example https://www.ontotext.com/blog/power-visualization-graphdb/)
   - AllegroGraph

     Show a visualization of a graph or sparql output.
     Note: there is also free Apache Fuseki, if you need it for a project, but it does not have visualizations.

1. (10 points) Using rdflib (open source python library), load the RDF into the graph and run the same sparql query. Again, feel free to use gpt for api calls.

Submission format:
<you name>.zip file with these files:

1. Json file:

   {"name": "your name",
    "Problem1 - rdf": "your rdf",
    "Problem1 - inferred rdf": "your rdf after inference",
    "Problem3": "your python code"
   }

1. Problem2.png - a screenshot image for visualization