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Class ID: 14

Problem Set (PS -1A)

1. Describe your Knowledge about Knowledge graph?

Answer:

Knowledge Graph can be simply stated as Knowledge in Graph. The knowledge graph is about collecting information about objects in the real world. The object could be an Animal, Person, Book and many other types of things. Thereby, capturing entities, attributes of those objects and relationships between objects. For example, for a famous person, we collect relevant data about them such as their name, date of birth, age. We can also connect that person to closely related objects in the Knowledge Graph. The Knowledge Graph is a knowledge base used by Google to enhance its search engine's search results with semantic-search information gathered from a wide variety of sources. It provides structured and detailed information about the topic in addition to a list of links to other sites. The goal is that users would be able to use this information to resolve their query without having to navigate to other sites and assemble the information themselves.

2. Why do we want to build such a knowledge graph?

Answer:

- Useful as Key tool for many AI tasks.
- Used to Combat against information overload.
- Explore via intuitive structure.
- Tool for supporting knowledge-driven tasks.
- Acts as a Bridge from data to human semantics.
- Use decades of work on graph analysis.

3. What steps are required? Show your own workflow for this task.

Answer:

Two perspectives are followed to build a knowledge Graph.
1) Knowledge Extraction
   - Name Entity Recognition: Is a subtask of information extraction that seeks to locate and classify named entities in text into pre-defined categories such as the names of persons, organizations, locations, expressions of times, quantities, monetary values, percentages.

   - Entity Coreference: The task of finding all expressions that refer to the same entity in a text.

- Relation Extraction: Extracting the relationships between different entities or objects.

- Semantic Role Labeling: It is a task in **natural language processing** consisting of the detection of the **semantic** arguments associated with the predicate or verb of a sentence and their classification into their specific **roles**.

2) Graph Construction
- Entity Linking: It is the task of determining the identity of entities mentioned in text.

- Entity Resolution: It involves the disambiguation of the entity according to a database. For example Entity Resolution is identifying that **Larry Page** and **Lawrence Page** are the same person. In other words - properly referring to (combining) mispelled entities, entities with different spelling Nestle and Nestlé, Coca-Cola and. Coke, Coca Cola.

- Collective Classification: It refers to classifying certain group of entities under one type.

- Link Prediction: It is a technique that involves predicting structured objects, rather than scalar discrete or real values.

4. What are the challenges?

Answer:

The challenges for building a Knowledge graph are mentioned below:

- Finding the entities in the graph?
- What are their attributes and types?
- How are they related?

5. Draw a knowledge graph for the given data.

CHICAGO (AP)Citing high fuel prices, United Airlines said Friday it has increased faresby $6 per round trip on flights to some cities also served by lower-cost carriers.American Airlines, a unit AMR, immediately matched the move, spokesman Tim Wagner said. United, a unit of UAL, said the increase took effect Thursday night andapplies to most routes where it competes against discount carriers, such as Chicago toDallas and Atlanta and Denver to San Francisco, Los Angelesand New York.

Answer:

Below is the knowledge graph for the given input data.