CS5560 Knowledge Discovery and Management

Problem Set (PS-1A)

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We are supposed to build a knowledge graph for the following input (text data).

CHICAGO (AP) — Citing high fuel prices, United Airlines said Friday it has increased fares by $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 and applies to most routes where it competes against discount carriers, such as Chicago to Dallas and Atlanta and Denver to San Francisco, Los Angeles and New York.

1. Describe your knowledge about knowledge graph.

The Knowledge Graph is Knowledge in graph form. It Captures entities, attributes, and relationships. The Knowledge Graph is a [knowledge base](https://en.wikipedia.org/wiki/Knowledge_base) used by [Google](https://en.wikipedia.org/wiki/Google) to enhance its [search engine](https://en.wikipedia.org/wiki/Search_engine)'s search results with [semantic-search](https://en.wikipedia.org/wiki/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. The short summary provided in the knowledge graph is often used as a spoken answer in [Google Now](https://en.wikipedia.org/wiki/Google_Now) searches. As of the end of 2016, knowledge graph holds over 70 billion facts.

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

Building of Knowledge graphs is important for the following reasons:

**Human’s perspective:**

* Combat information overload.
* Explore via intuitive structure.
* Tool for supporting knowledge-driven tasks.

**Artificial Intelligence perspective:**

* Key ingredient for many AI tasks.
* Bridge from data to human semantics.
* Use decades of work on graph analysis.

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

The steps involved for building knowledge graphs are:

**Knowledge Extraction from Text:**

* NLP Fundamentals.
* Information Extraction.

**Knowledge Graph Construction:**

* Probabilistic Models
* Embedding Techniques.

The steps involved for Natural language processing are:

1. Dependency Parsing, Part of speech tagging, Named entity recognition.
2. Coreference Resolution.
3. Entity resolution, Entity linking, Relation extraction
4. What are the challenges?

Challenges involved for building the knowledge graph are:

* Chunking.
* Polysemy/word sense disambiguation.
* Entity coreference.
* Relational extraction.

1. Draw a knowledge graph for the given data.

