CS5560 Knowledge Discovery and Management

In-Class-Exercise (ICE-1A)

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

1. Describe your knowledge about knowledge graph.
2. Why do we want to build such a knowledge graph?
3. What steps are required? Show your own workflow for this task.
4. What are the challenges?
5. Draw a knowledge graph for the given 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. 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. knowledge Graph display was added to Google's search engine in 2012.

2. Information in text format is not machine readable. And its pretty hard to figure out whether Rome is in Europe by looking the text. So Google is trying to build a database that can answer this kind of question efficiently. And we feed

it from a variety of sources, partially by trying extract facts from text.

knowledge Graph is actually quite close to the new wikimedia project.

3.   From Text to knowledge Graph converting, so there are 5 step required to do. Those are:

1. Natural Language Processing (NLP):-

NLP is a way for computers to analyze, understand and derive meaning from human language in a smart and useful way. By utilizing NLP, developers can organize and structure knowledge to perform tasks such as automatic summarization, translate etc.

2. Information Retrieval | Information Extraction:-

The task of automatically extracting structured information from unstructured and/or semi-structured machine readable documents. This activity concerns processing human language texts by means of NLP.

3. Topic Discovery:- Topic Discovery is a type of statistical model for discovering the abstract 'topics' in a collection of documents.

4. Knowledge Graph construction:- Graph construction cleans and completes extraction graph. Incorporate ontological constrains and relational patterns. Discovers relationships within knowledge graph.
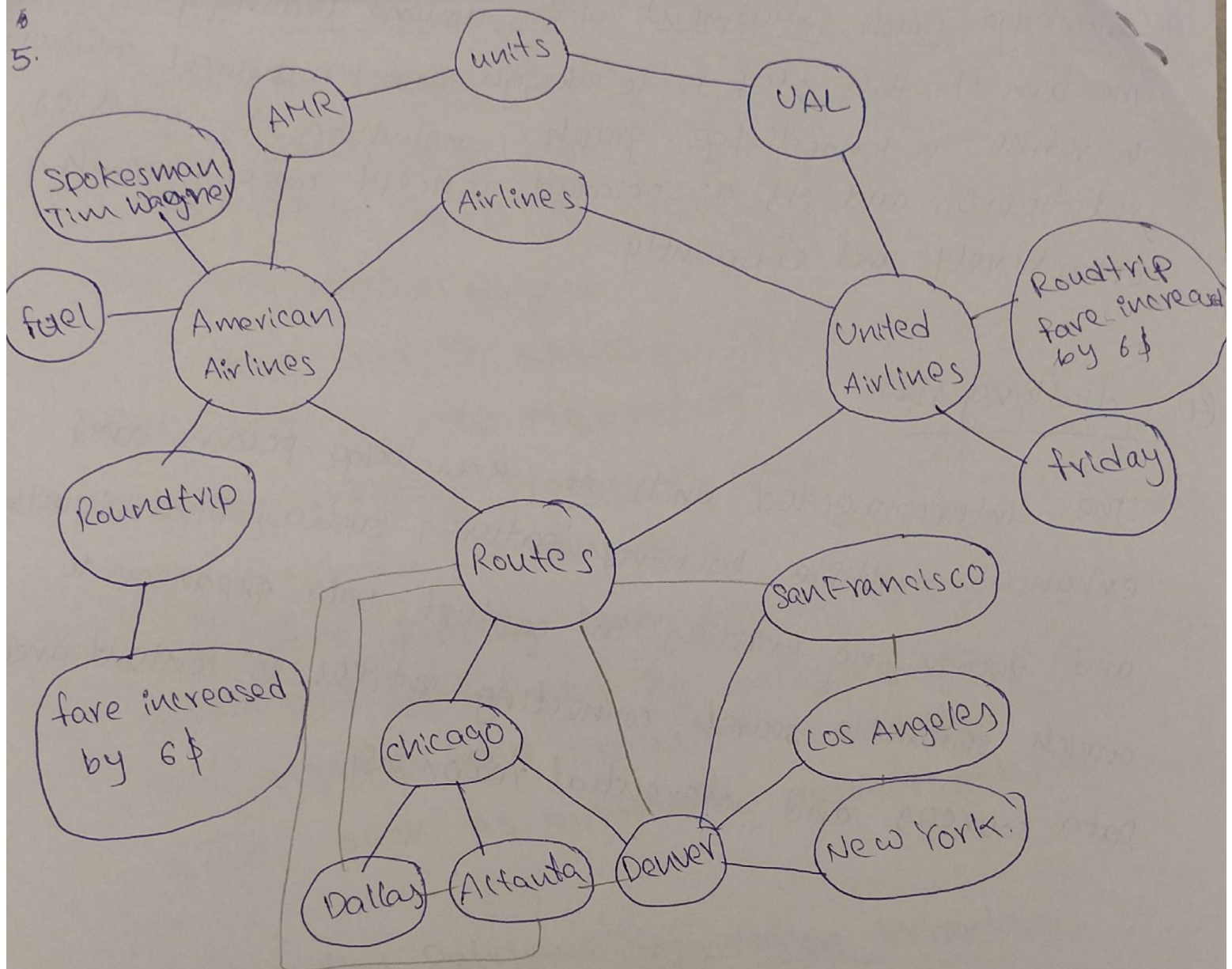
Knowledge Graph Refinement with Machine Learning:-

The aim of this step is to design novel technical solution to refine a knowledge graph, including its entities, relations, and its associated concept concept graph effectively and efficiently.

④ **challenges:-**

The interconnected units of knowledge powers and enhances multiple backend features such as Disambiguating and Recognizing entities in context, Data expansion to enrich semantic search, connecting entities to content and Data sources and inferential reasoning.

5.

Nodes in the knowledge graph:
- units — AMR — UAL
- Spokesman Tim Wagne — Airlines
- fuel — American Airlines — United Airlines — Roudtrip fare increased by 6$
- Roundtrip — friday
- fare increased by 6$ — Routes — SanFrancisco
- chicago — Los Angeles
- Dallas — Atlanta — Denver — New York

knowledge graph for the given Data.