Far from the Madding Subjects: A Comparison of Controlled and Open Authority for Metadata Remediation

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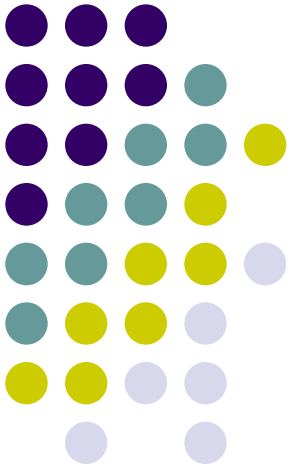
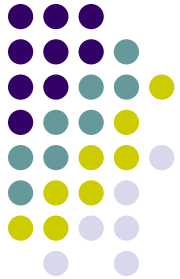


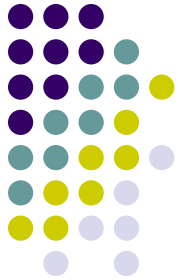
Remediation Overview



- Why remediating the metadata?
  - The goal is to improve searching and browsing, and support faceted search.

- What to remediate?
  - In this summer we focused on 2 aspects: consistency of metadata and enhancement of metadata.

Why a full knowledge base?

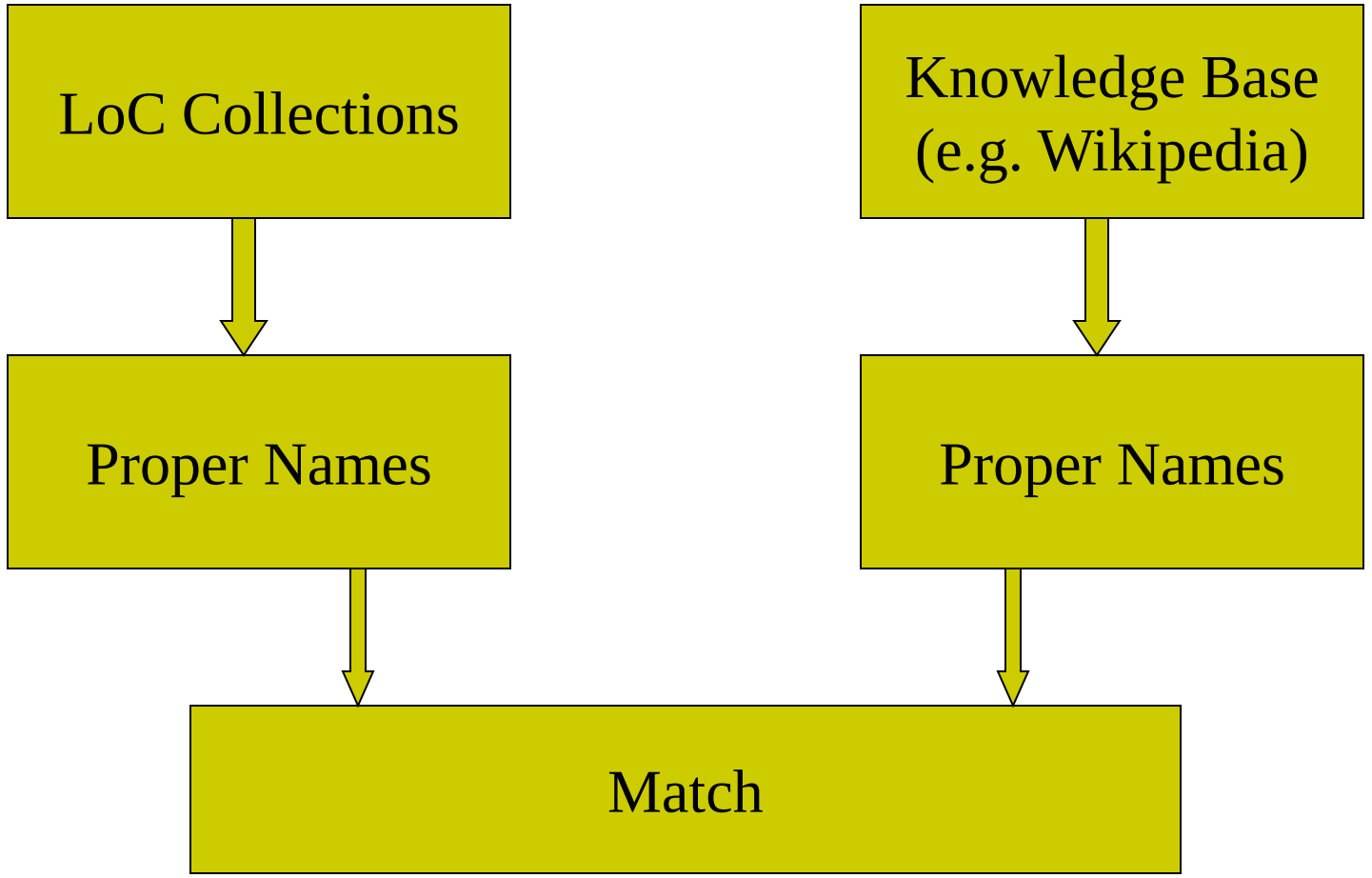


We can extract proper names (person, location, event) from text.

However, to really use them we need to match these names to a knowledge base.

By matching the names to the knowledge base, we uniquely determine the entity being referenced, and we obtain additional information.

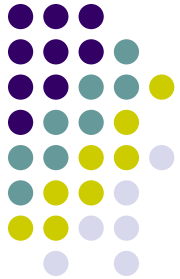
A Simple Work Flow



Comparison of Three Candidate Knowledge Bases

Knowledge base	Reliability of information	Size	Internal links	Classified	Descriptive information
LC Authority Files	Very high	Huge	No	Yes	Low
Wikipedia	High	Large	Yes	No	High
Freebase	Reasonably high	Huge	No	Yes	Low

Pros and Cons – LC Authority Files



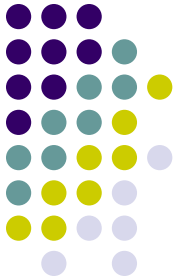
Pros:

- LC name authority files contains a huge amount of items, with high reliability.
- The items are well classified.

Cons:

- Each item has limited description, making it hard to disambiguate.
- LC authority files was not designed for detailed description of headings, but rather to uniquely identify them.

Pros and Cons – Wikipedia



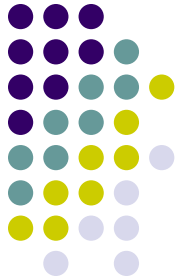
Pros:

- Wikipedia redirects and internal links are extremely useful for our purpose.
- Each item in Wikipedia comes with a detailed description.

Cons:

- Wikipedia data is relatively hard to access.
- Wikipedia pages are not fully classified.
- Wikipedia has a smaller number of items.

Pros and Cons – Freebase



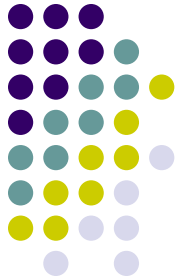
Pros:

- Freebase collects its data from different sources, with Wikipedia being the major one.
- 8,367,566 items are completely classified into 2,221 bases.
- The most related information are extracted for each base.

Cons:

- Limited description per item.
- Data is collected from different sources, making redundancy and consistency a problem.

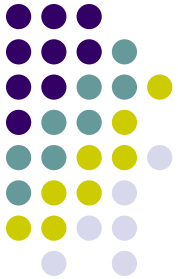
So… What Works Best for us?



- We definitely want the Wikipedia links and redirects.
- We want the topics to be classified.
- We want the most related information extracted.
- The data should be easy to access.

- Is there even such a thing???

A Simple Solution!



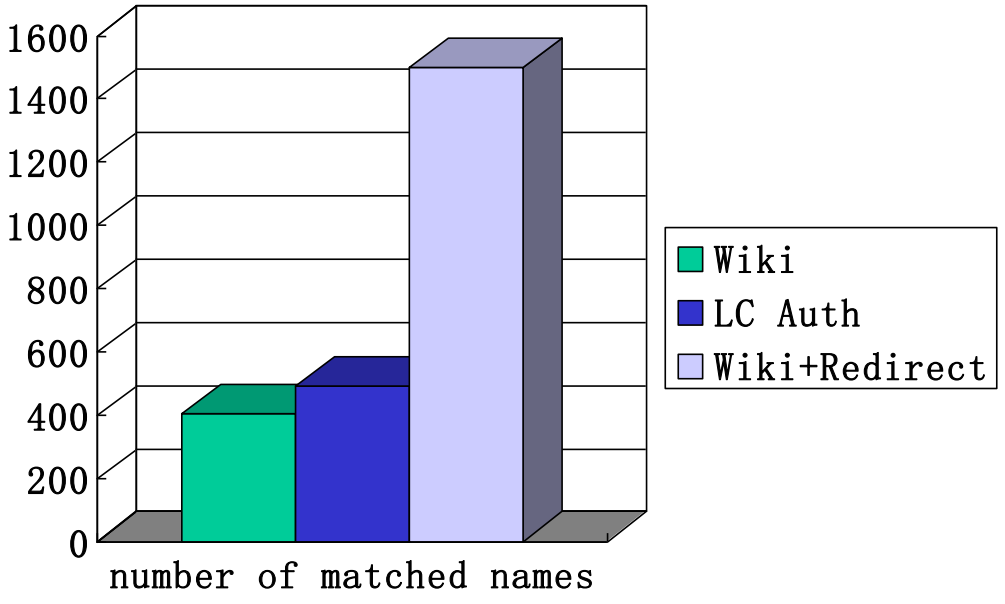
Freebase Wikipedia Extraction (WEX) classifies Wikipedia pages.

WEX also contains other useful Wikipedia data in a very accessible format.

So, Wikipedia plus WEX is the solution!

Testing with Abraham Lincoln Collection

- Here we extracted all person names from the Abraham Lincoln collection.
- On the right shows the number of matched names.



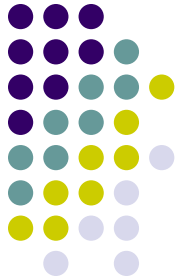
Test Result

Using Wiki + WEX, we matched a total of 1500 unique person out of 23,407 recognized names.

We sampled and validated 300 matched names. The accuracy is about 90%.

Most incorrect matches can be eliminated by simple criterions.

From Data to Application



- What do we do with the enhanced metadata?
  - Les Fletcher suggested building a mobile phone application, so that when people visit a place they can use the app to search for books (or other artifacts) that is related to that particular location (or person).
  - David Gleich suggested hyperlinking the text in LoC to Wikipedia, so while browsing LoC collections the user can find out related information from Wikipedia.

Conclusion

- We compared 3 knowledge bases for metadata remediation and obtained preliminary results.
- The study shows that Wikipedia + Freebase WEX works brilliant for our purpose.
- The experiment on Lincoln collection yields promising results.
- The enhanced metadata has great potential in future applications.

Next Step

- Extend current work (person, events) to include more categories (geographical features, musical works, etc.).

- Study the problem of disambiguation: when a name matches several items in the knowledge base, which one shall we pick?

This issue will be discussed in my next talk, so don't go away!☺