Lecture 19: Question Answering

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Course webpage: http://kwchang.net/teaching/NLP16
Question answering

‘Watson’ computer wins at ‘Jeopardy’
Question answering

- Go beyond search

What's the capital of Wyoming?

About 984,000 results (0.54 seconds)

Wyoming / Capital

Cheyenne
Go beyond traditional web search

Answer queries using structured knowledge

- Google Knowledge Graph
- Facebook Graph Search
- Bing’s Satori

Need to understand the query!

The following slides are modified from Christopher Manning & Pandu Nayak’s intro. to IR.
painkillers that don't upset stomach

About 29,700 results (0.15 seconds)

Symptoms of Crohn's

Best Pain Reliever, Over the Counter Pain Relievers, Prescription ...
For stomach upset, eating or drinking milk before you take a painkiller can help. ... Don't expect painkillers to relieve all your pain, but the best pain ...
www.healthblurbs.com/best-pain-reliever-over-the-counter-pain-relievers-prescription-analgesic-painkillers/ - Cached - Similar

Why do painkillers make your stomach hurt? - Yahoo! Answers
Aug 30, 2008 ... stomach upset, reflux/indigestion, or if severe ulcers ... I often take painkillers FOR stomach aches lol. Don't do this again. 2 years ago ...
answers.yahoo.com › Health › Other - Health - Cached - Similar

How are painkillers bad for you? - Apr 13, 2010
What effect do painkillers have on you? - Sep 30, 2009
What's the difference between OTC painkillers? (Advil, Aleve ... - Nov 19, 2008
Is it bad to take painkillers on an empty stomach? - Aug 20, 2008
More results from answers.yahoo.com

Phys Ed: Does Ibuprofen Help or Hurt During Exercise? - NYTimes.com
Sep 1, 2009 ... When are ibuprofen and other anti-inflammatory painkillers justified? ... Can't take NSAIDS due to upset stomach. — bonemri ... Perhaps part of the problem is that you don't always have the option to rest your injury if ...

Example from Fernando Pereira (GOOG)
class  negation  synonyms

painkillers that don't upset stomach

About 29,700 results (0.15 seconds)

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w well.blogs.nytimes.com/.../phys-ed-does-ibuprofen-help-or-hurt-during-exercise/ - Cashed - Similar
"painkillers such as * tylenol"

About 19,200 results (0.21 seconds)

TYLENOL® Official Site
Tylenol.com  Pain Relief from TYLENOL. Get Information and Coupons Here.
Head & Body Pain - Arthritis Pain - Sinus - Cold & Flu

Ovarian hyperstimulation syndrome (OHSS): Treatments and drugs ...
To ease abdominal discomfort, take over-the-counter painkillers such as acetaminophen (Tylenol) others) or ibuprofen (Advil, Motrin, others). ...
www.mayoclinic.com/.../DSECTION=treatments-and-drugs - Cached - Similar

tylenol ⇒ painkiller
upset stomach ⇒ adverse effect (on stomach)
tylenol ⇒ no adverse effects (on stomach)
⇒ no upset stomach
painkiller  upset  stomach
Paradigms for question answering

- Text-based approaches
  - TREC QA, IBM Watson

- Structured knowledge-based approaches
  - Apple Siri, Wolfram Alpha, Facebook Graph Search
Task – Answer Sentence Selection

- Given a factoid question, find the sentence that
  - Contains the answer
  - Can sufficiently support the answer

Q: Who won the best actor Oscar in 1973?

S₁: Jack Lemmon was awarded the Best Actor Oscar for Save the Tiger (1973).

S₂: Academy award winner Kevin Spacey said that Jack Lemmon is remembered as always making time for others.

Scott Wen-tau Yih (ACL 2013) paper
Lemmon was awarded the Best Supporting Actor Oscar in 1956 for *Mister Roberts* (1955) and the Best Actor Oscar for *Save the Tiger* (1973), becoming the first actor to achieve this rare double.

*Source: Jack Lemmon -- Wikipedia*
What is the fastest car in the world?

The Jaguar XJ220 is the dearest, fastest and most sought after car on the planet.

Assume that there is an underlying alignment

- Describes which words in and can be associated
Knowledge-based QA

- Build a semantic representation of the query
  - Times, dates, locations, entities, numeric quantities
- Map from this semantics to query structured data or resources
  - Database
  - Ontologies (Wikipedia infoboxes, dbPedia, WordNet, Yago)
  - Scientific databases
Linking Open Data cloud Diagram

http://lod-cloud.net/