

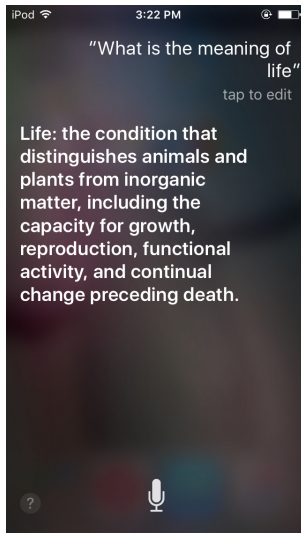
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An approach for QA using dependency parsing

Tp. Hồ Chí Minh, Tháng 03/2018

Question Answering



Type of Questions

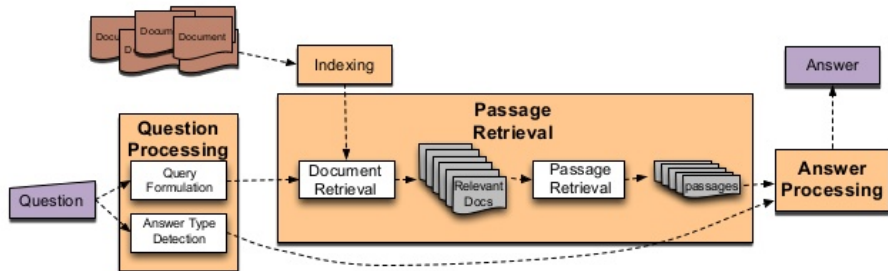
- Factoid questions
 - Who is Putin?
 - How much water should a person drink a day?
 - Who wrote the book forrest gump was based on?
 - Does C++11, 14, 17 or 20 introduce a standard constant for pi?
- Non-factoid questions
 - What is the meaning of life?
 - Does writing matter a lot in research?
 - How can I give out my telephone number to my neighbors without implying anything?

Approaches for QA

- Information Retrieval approaches
 - Answer the question based on textual data.
 - Given a question, IR systems find out the paragraph that answer for it.

Information Retrieval approaches

IR-based Factoid QA



Information Retrieval approaches

Q: *Which US state capital has the largest population?*

- **Answer Type:** city
- **Query:** US state capital, largest, population
- **state capital**

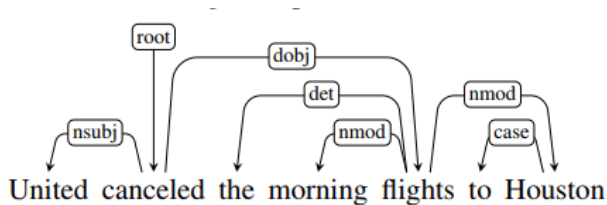
Approaches for QA

- Knowledge-based and Hybrid approaches
 - We convert the question into a semantic representation (kind of SQL queries).
 - Ex: *"What countries has population over 100 milions?"* \Rightarrow *SELECT country.name FROM country WHERE country.population > 10^9*

Approaches for QA

- Information Retrieval approaches
 - Based on retrieving and reranking documents.
 - Easier to implement.
 - Not precise comparing to KB
 - We don't understand the meaning of the questions.
- Knowledge-based and Hybrid approaches
 - Base on exact queries over a structured database.
 - Hard to implement (of course).
 - Precise
 - Help us understand the **semantic meaning** of the questions.

Dependency parsing



Dependency parsing

Type of Dependencies

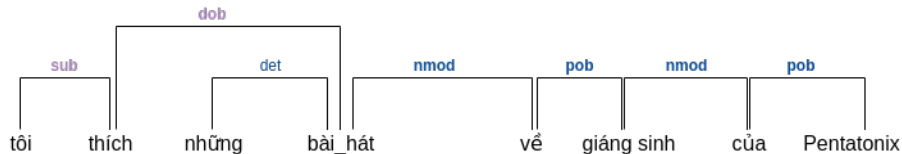
Clausal Argument Relations	Description
NSUBJ	Nominal subject
DOBJ	Direct object
IOBJ	Indirect object
CCOMP	Clausal complement
XCOMP	Open clausal complement
Nominal Modifier Relations	Description
NMOD	Nominal modifier
AMOD	Adjectival modifier
NUMMOD	Numeric modifier
APPOS	Appositional modifier
DET	Determiner
CASE	Prepositions, postpositions and other case markers
Other Notable Relations	Description
CONJ	Conjunct
CC	Coordinating conjunction

Dependency parsing

Properties of dependency tree

- There is a single designed root node that has no incoming arcs.
- With the exception of the root node, each vertex has exactly one incoming arc.
- There is a unique path from the root node to each vertex in V .
- Dependency tree is projective.

Dependency parsing



Tham khảo