

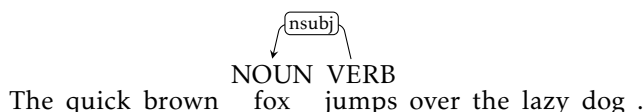
Dependency Parsing exercises: Dependency Structures

Part 1

Deadline: 23.04.2018

Please send completed solutions to jakub.waszczyk@phil.uni-duesseldorf.de with subject "dependency homework" and an attachment "ex1_lastname(s).pdf".

1. Complete the dependency analysis of the sentence:



Use the Universal Dependency (UD) annotation scheme. Each word should have a part-of-speech tag and an incoming edge from its head, labeled with a basic dependency relation (e.g., nsubj, obj, ...).

Useful links:

- UD annotation guidelines: <http://universaldependencies.org/guidelines.html>
- UD POS tags: <http://universaldependencies.org/u/pos/index.html>
- UD relations: <http://universaldependencies.org/u/dep/index.html>

Draw the diagram by hand or use your favorite drawing software. If you use \LaTeX , `tikz-dependency` is recommended.

(You could 'cheat' by letting the computer parse the sentence for you using one of the available online parsers, but it's useful to practice working with dependency structures for the rest of the course.)

2. Have a look at the (now deprecated) Stanford annotation scheme:

- Stanford POS tags:
https://www.ling.upenn.edu/courses/Fall_2003/ling001/penn_treebank_pos.html
- Stanford relations:
https://nlp.stanford.edu/software/dependencies_manual.pdf

Is the Stanford-based¹ analysis of the sentence from Ex. ?? the same as the UD-based analysis? What are the main differences?

Consider the situation when an annotation standard (here: Stanford) becomes deprecated – does it mean that a treebank following this standard becomes obsolete, too? Or maybe one can simply add new annotated data, consistent with the new standard (here: UD), to the old treebank? Discuss.

¹ Assume the *Basic* dependency representation, as described in Sec. 4.1 of the Stanford manual.

3. Give an example of an ambiguous sentence and explain the ambiguity in terms of dependency relations.

For example: “John sees Mary with a telescope.” Ambiguity: the prepositional phrase ‘with a telescope’ is a dependent of either ‘sees’ or ‘Mary’.

Other ideas for difficult sentences: headlines, informal language, questions, etc.

Try giving the sentence to an online parser. For example:

- <https://demos.explosion.ai/displacy/>
- <http://demo.ark.cs.cmu.edu/parse>
- <http://corenlp.run/>

Show the analysis given by the parser. Is it the correct analysis? If not, show the expected analysis. If it is, repeat with a more difficult sentence.

4. Additional exercises (facultative) – propose dependency structures for the following sentences, using the UD annotation scheme:

- (a) The rabbit ran quickly out of the burrow
- (b) All the kids have left with their mother
- (c) Jack spoke about his problems with the judge
- (d) The gardener and the director confirm that the door was closed
- (e) He is the man I met the other day
- (f) The robber refused to say where the money is hidden