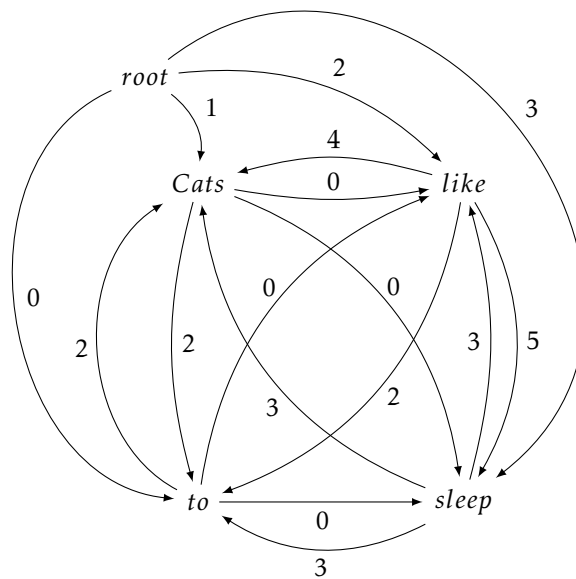


# Dependency Parsing: Chu-Liu-Edmonds'

Deadline: 28.05.2018. Please send completed solutions to [jakub.waszczyk@phil.uni-duesseldorf.de](mailto:jakub.waszczyk@phil.uni-duesseldorf.de) with subject "dependency homework" and an attachment "cle\_lastname(s).pdf".

1. We would like to parse the sentence "Cats like to sleep". To do so, we use the weights represented by the following graph:



We ignore the labels of dependency arcs (only the weight of the best label is given). We also assume that the weight of a dependency tree is the sum of the weights of its arcs.

Using Chu-Liu-Edmonds' algorithm, determine the best parse of the sentence with the given weights. Please show all the intermediate graphs used during the parsing process.

2. Consider the sentence ("hearing scheduled subject today") and the weights from the `example.pdf` file (available on the website). Would Eisner's algorithm output the same dependency tree as the tree computed by Chu-Liu-Edmonds' algorithm? Explain.
3. Imagine that you have three high-performing dependency parsers and none of them is consistently out-performing the other two.<sup>1</sup> Is it possible to combine the three parsers into a single parser using Chu-Liu-Edmonds' algorithm so as to obtain a solution which is, potentially, better than any of the three input parsers? If so, explain how to do this. Would it be reasonable to use Eisner's algorithm instead? Discuss.

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<sup>1</sup>That is to say, for each of the three parsers, there are sentences which are best analyzed by this parser.