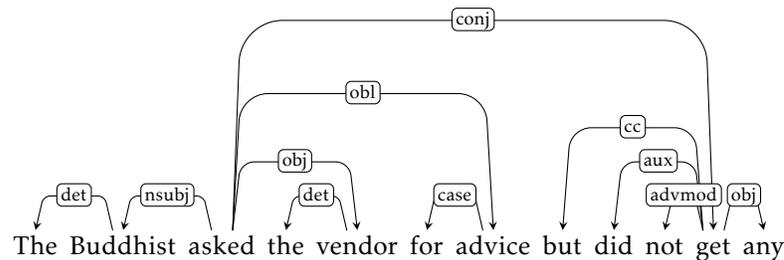


# Dependency Parsing exercises: Dynamic oracles

Deadline: ~~31.05.2021~~ 3.06.2021

Please send completed solutions to waszczuk@hhu.de and evang@hhu.de with subject "dependency homework" and attachment "ex7\_lastname(s).pdf".

1. Consider the following dependency tree:



Assume the arc-eager parser and the following partial transition sequence predicted by a classifier:<sup>1</sup>

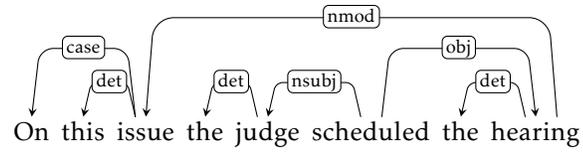
TRANSITION	STACK	BUFFER	ARCS
	[ROOT]	[The Buddhist asked the vendor ...]	∅
SH	[ROOT The]	[Buddhist asked the vendor ...]	
LA	[ROOT]	[Buddhist asked the vendor ...]	+(The ← Buddhist)
SH	[ROOT Buddhist]	[asked the vendor ...]	
LA	[ROOT]	[asked the vendor ...]	+(Buddhist ← asked)
RA	[ROOT asked]	[the vendor for advice ...]	+(ROOT → asked)
SH	[ROOT asked the]	[vendor for advice ...]	
LA	[ROOT asked]	[vendor for advice ...]	+(the ← vendor)
SH	[ROOT asked vendor]	[for advice ...]	

As you can see, the parser made a mistake in the last transition. Answer the following two questions:

- How will the parser recover from the mistake if it follows the static oracle, i.e., if the remaining predictions are consistent with the static oracle? Show the remaining part of the transition sequence.
- What if the remaining predictions of the parser are consistent with the dynamic oracle instead? What will be the set of reconstructed arcs then? Show one possible transition sequence and in each step (row) indicate alternative transitions licensed by the dynamic oracle (if any).

2. Consider the following dependency tree:

<sup>1</sup>The labels are ignored for simplicity.



Assume the arg-eager parsing strategy, where:

- The initial configuration is  $([\text{ROOT}], [\text{On, this, issue, } \dots, \text{the, hearing}], \emptyset)$
- A terminal configuration is any configuration of the form  $(\sigma, [], A)$

What will be the set of arcs if the *dynamic oracle* is used to reconstruct this tree? Will it differ from the set of arcs in the tree shown above? If so, why is that the case?