Dependency Parsing

Outline

Two formalisms for syntactic structure: Phrase structure and dependencies

Two algorithms for dependency parsing

- Transition based dependency parsing
- Graph based dependency parsing

Evaluating dependencies

Evaluating dependency parsers

The goal: Given a predicted tree and a reference tree

- How different is the structure of the predicted tree from that of the reference?
- How different are the labels of the predicted tree edges from the labels on the reference?

Correspondingly, there are two scores:

- Labeled attachment score
- Unlabeled attachment score

A worked example

$$\text{Accuracy} = \frac{\text{Number of correct dependencies}}{\text{Number of dependencies}}$$

1	2	3	4	5	6
The	tabby	cat	scratched	the	couch

Word	Dependent	Head	Label
The	1	3	det
tabby	2	3	amod
cat	3	4	subj
scratched	4	0	root
the	5	6	det
couch	6	4	obj

Gold standard dependencies

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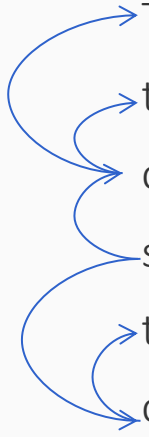

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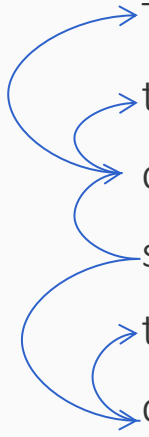

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Two edges are structurally incorrect

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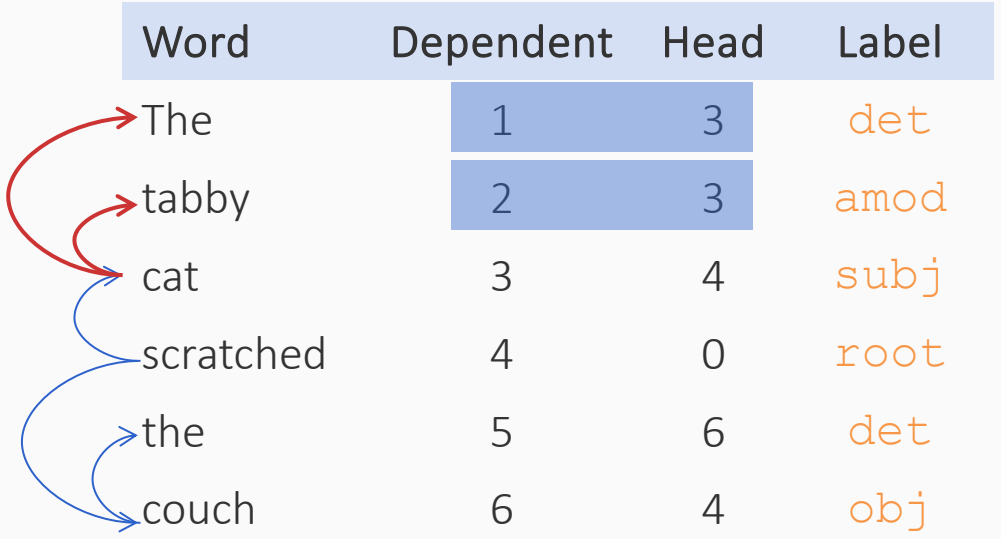

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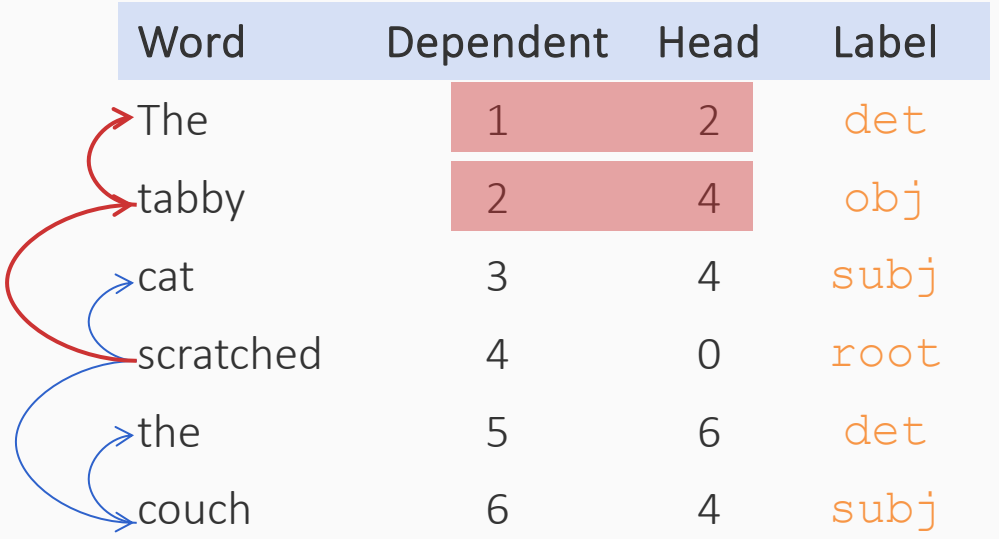

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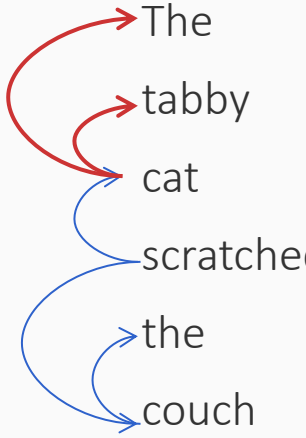
Two edges are structurally incorrect

Unlabeled attachment score = 4/6 = 66.6%



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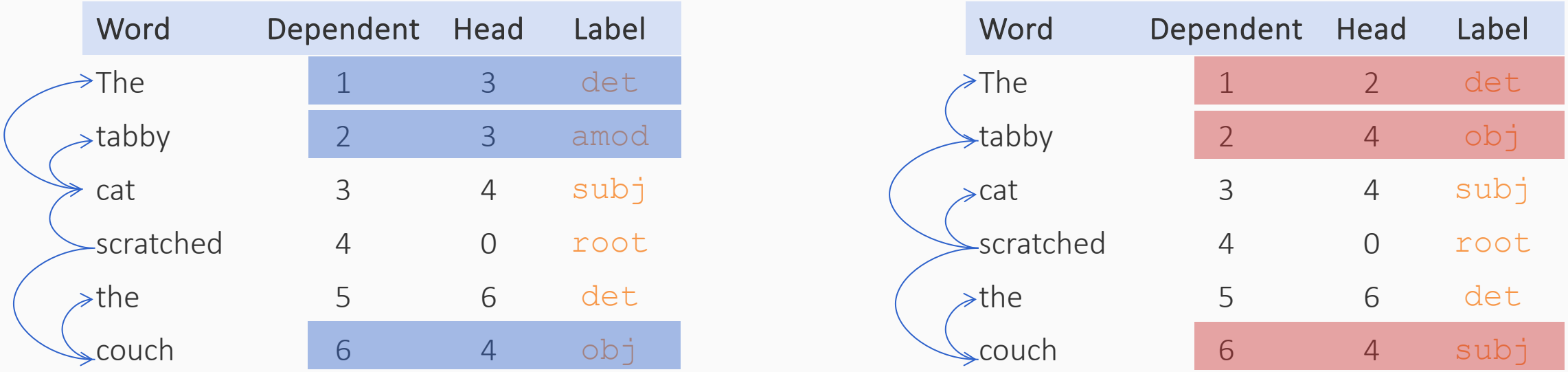
Three labeled edges are incorrect



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Predicted dependencies

A worked example

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Three labeled edges are incorrect

Labeled attachment score = 3/6 = 50%

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