1 Lecture 5

1. Assuming an appropriate oracle, could all the word orders in the Russian example be assigned a dependency structure using the algorithm described in the lecture notes?

2. Suppose that the CFG given in section 4.3 was extended by addition of the following rules:

\[
\begin{align*}
\text{NP} &\rightarrow \text{Det Nbar} \\
\text{Nbar} &\rightarrow \text{N} \\
\text{Nbar} &\rightarrow \text{Adj Nbar} \\
\text{N} &\rightarrow \text{dog} \\
\text{N} &\rightarrow \text{carrot} \\
\text{V} &\rightarrow \text{wants} \\
\text{Adj} &\rightarrow \text{small} \\
\text{Det} &\rightarrow \text{the} \\
\text{Det} &\rightarrow \text{a}
\end{align*}
\]

Give a parse tree (or a bracketed structure) for the following sentences, and show how comparable dependency structures could be constructed using the algorithm described in the lecture notes (assuming a suitable oracle).

- the dog wants fish
- a small dog wants a small carrot
- they fish in rivers in December