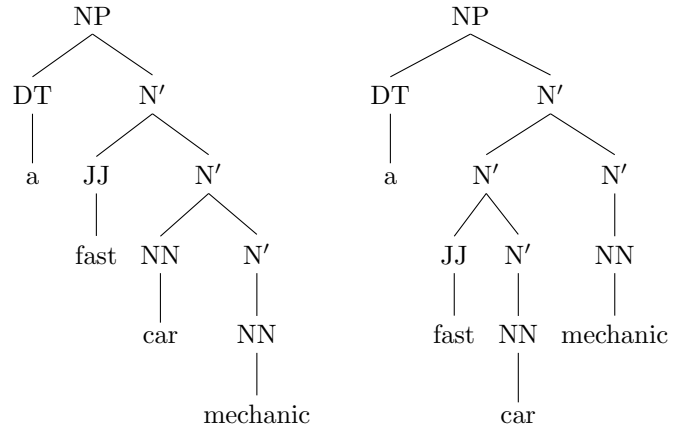
1 Weaknesses of PCFGs

1.1 Question (time: 9:15, slide: 5)

Consider the following two parse trees



Which of the following statements is true?

(a) The two parse trees receive the same probability under any PCFG.

(b) The first parse tree receives higher probability if $q(\mathrm{N}' \rightarrow \mathrm{NN\ N}') > q(\mathrm{N}' \rightarrow \mathrm{N}'\ \mathrm{N}')$.

(c) Neither of the above.

A Answers

- (c)

  Let the probability of the first tree be $q(\mathrm{N}' \to \mathrm{NN}\ \mathrm{N}') \times c$ for some value c, then the probability of the second tree is $q(\mathrm{N}' \to \mathrm{N}'\ \mathrm{N}') \times q(\mathrm{N}' \to \mathrm{N}) \times c$. Condition 1 is definitely not true, and condition 2 is not enough to ensure that the first tree has higher probability.