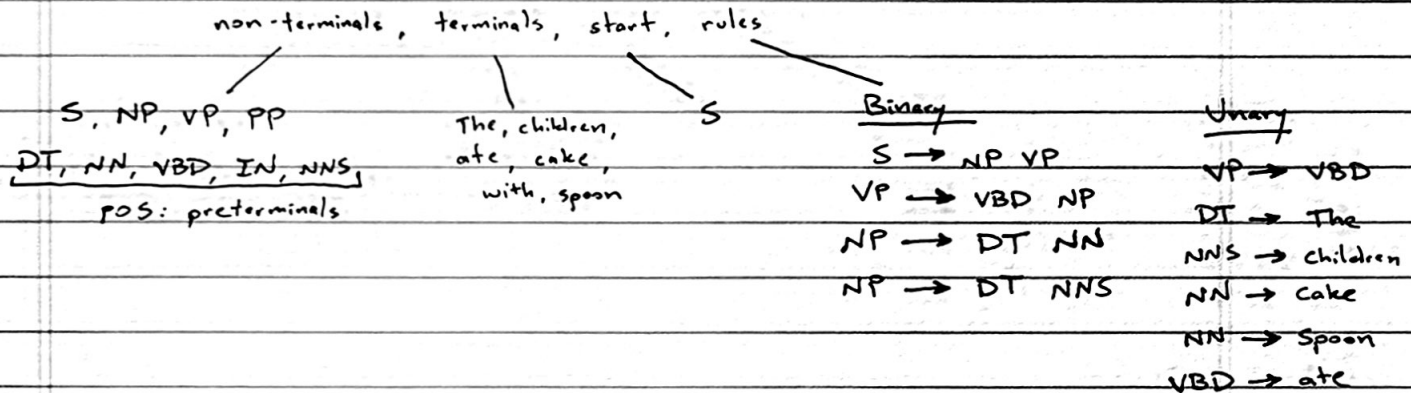


Probabilistic Context-Free Grammars

• CFG's : $\{N, T, S, R\}$



• PCFG : Rules have probabilities, probabilities sum to 1 per parent

$$P(\text{tree } T) = \prod_{\text{rules}} P(\text{rule} | \text{Parent}(\text{rule}))$$

• Steps to Parsing :

Given a freebank of sentences labeled with trees

① Binarization

② Estimation of rule probs
(count + normalize)
(maximum likelihood est.)

③ Inference

$$\underset{T}{\operatorname{argmax}} P(T(\bar{x}))$$

(most likely tree given a sentence)

Binarization

