

Probabilistic Context-Free Grammar (PCFG) Exercise

Syntactic Rules:

1. $S \rightarrow NP\ VP$ (probability=1.0)
2. $NP \rightarrow DT\ NN$ (probability=0.5)
3. $NP \rightarrow NN\ PP$ (probability=0.5)
4. $VP \rightarrow VBD\ NP$ (probability=0.5)
5. $VP \rightarrow VP\ PP$ (probability=0.5)
6. $PP \rightarrow IN\ NP$ (probability=1.0)

Lexical Rules:

1. $NN \rightarrow \text{fisherman}$ (probability=0.33)
2. $NN \rightarrow \text{caviar}$ (probability=0.33)
3. $NN \rightarrow \text{spoon}$ (probability=0.33)
4. $VBD \rightarrow \text{ate}$ (probability=0.5)
5. $VBD \rightarrow \text{spoon}$ (probability=0.5)
6. $IN \rightarrow \text{with}$ (probability=1.0)
7. $DT \rightarrow \text{a}$ (probability=0.5)
8. $DT \rightarrow \text{the}$ (probability=0.5)

Generate an example sentence, starting with S: