

# CS685 Quiz 5: parsing

Released 4/29, due 5/6 on Gradescope (please upload a PDF!)

We have the following PCFG:

$S \rightarrow NP VP$  1.0  
 $NP \rightarrow NP PP$  0.4  
 $PP \rightarrow P NP$  1.0  
 $VP \rightarrow V NP$  0.7  
 $VP \rightarrow VP PP$  0.3  
 $P \rightarrow \text{with}$  1.0  
 $V \rightarrow \text{saw}$  1.0  
 $NP \rightarrow \text{astronomers}$  0.1  
 $NP \rightarrow \text{ears}$  0.18  
 $NP \rightarrow \text{saw}$  0.04  
 $NP \rightarrow \text{stars}$  0.18  
 $NP \rightarrow \text{telescopes}$  0.1

1. Provide one parse for the sentence "astronomers saw stars with ears" that is valid under this grammar.
2. What is the probability of this parse? Please write out the computation in addition to providing the probabilities.



