

## EECS 595 NLP Homework3 Assignment.

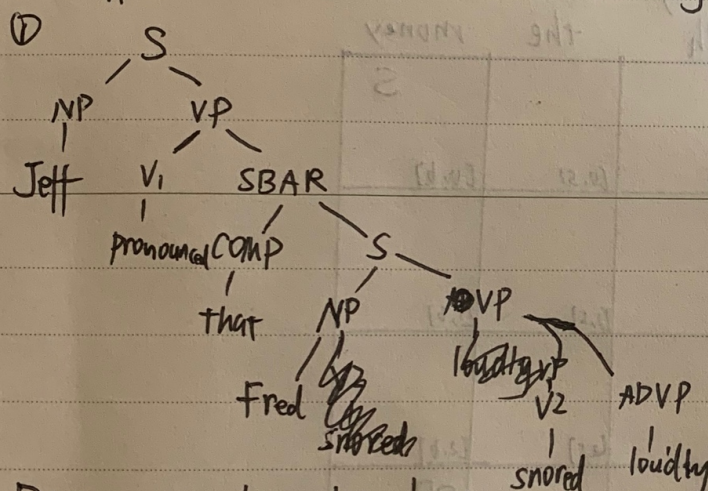
## Written Assignment

## 1. 1) PCFG.

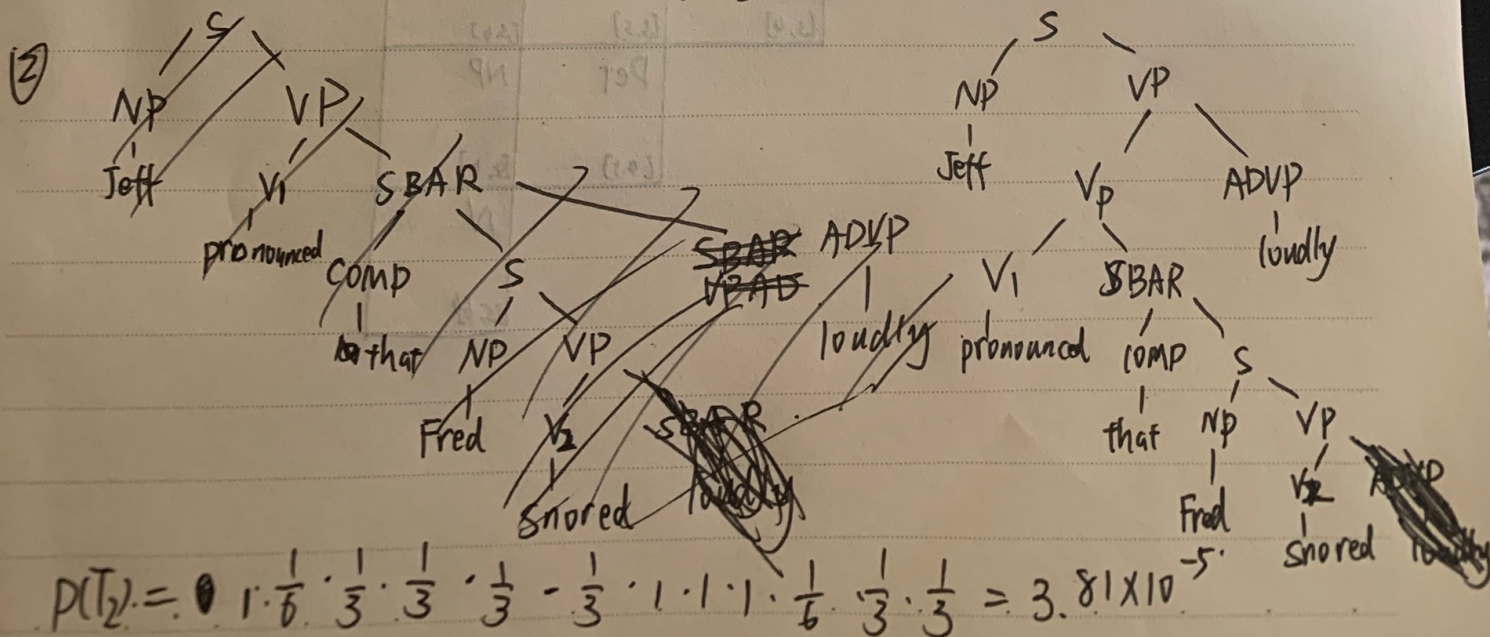
Grammar	P
$S \rightarrow NP VP$	$[1.]$
$NP \rightarrow VP \rightarrow V_1 SBAR$	$[0.33]$
$VP \rightarrow V_2$	$[0.33]$
$VP \rightarrow VP ADVP$	$[0.33]$
$SBAR \rightarrow COMP S$	$[1.]$

Lexicon
$NP \rightarrow \text{John} [\frac{1}{6}]   \text{Sally} [\frac{1}{3}]   \text{Bill} [\frac{1}{6}]   \text{Fred} [\frac{1}{6}]   \text{Jeff} [\frac{1}{6}]$
$VP \rightarrow V_1 \rightarrow \text{swam} [\frac{1}{3}]   \text{ran} [\frac{1}{3}]   \text{snored} [\frac{1}{3}]$
$ADVP \rightarrow \text{loudly} [\frac{1}{3}]   \text{quickly} [\frac{1}{3}]   \text{elegantly} [\frac{1}{3}]$
$COMP \rightarrow \text{That.} [1.]$
$V_1 \rightarrow \text{said} [\frac{1}{3}]   \text{announced} [\frac{1}{3}]   \text{declared} [\frac{1}{3}]$

2) "Jeff pronounced that <sup>Fred</sup> snored loudly."



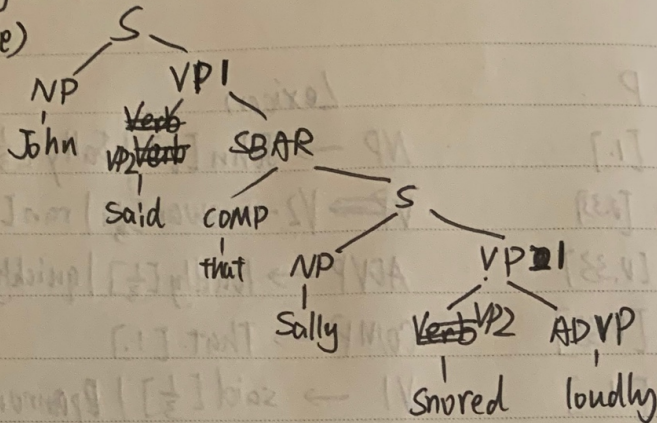
$$P(T_1) = 1 \cdot \frac{1}{6} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot 1 \cdot 1 \cdot 1 \cdot \frac{1}{6} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} = 2.38 \times 10^{-6}$$



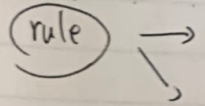
$$P(T_2) = 1 \cdot \frac{1}{6} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot 1 \cdot 1 \cdot 1 \cdot \frac{1}{6} \cdot \frac{1}{3} \cdot \frac{1}{3} = 3.81 \times 10^{-6}$$



3).

change the original structures to  
(example)

Classes



2. "Book the flight with the money"

Book	the	flight	with	the	money
S, VP, Verb Nominal, Noun V [0,1]		VP [0,3]		S [0,6]	
	Det [1,2]	NP [1,3]	PP [1,4]		
		N [2,3]			
			Prep [3,4]		PP [3,6]
				Det [4,5]	NP [4,6]
					N [5,6]