



UJIAN AKHIR SEMESTER GASAL 2020 – 2021

Mata Kuliah : Natural Language Processing (TF4431)
 Hari / Tanggal : Senin / 7 Desember 2020
 Waktu : 120 menit (07.30 – 09.30 WIB)
 Sifat Ujian : Open
 Dosen : Dr. Ir. Endang Setyati, M.T

1. (40 point) Kindly refer to Picture 1 and answer the following questions:
 - a. (10) Generate possible parse trees for this sentence:
"Book a flight that include dinner"
 - b. (10) Generate possible parse tree for this sentence:
"I prefer book the flight from Houston to NWA"
 - c. (10) For all parse trees in (A), put head words on the tree branches.
 - d. (10) Change the grammar to CNF and recalculate the probability of each production.

Picture 1:

Grammar		Lexicon	
$S \rightarrow NP VP$	[.80]	$Det \rightarrow that$	[.10] a [.30] the [.60]
$S \rightarrow Aux NP VP$	[.15]	$Noun \rightarrow book$	[.10] $flight$ [.30]
$S \rightarrow VP$	[.05]	$meal$ [.05] $money$ [.05]	
$NP \rightarrow Pronoun$	[.35]	$flight$ [.40] $dinner$ [.10]	
$NP \rightarrow Proper-Noun$	[.30]	$Verb \rightarrow book$	[.30] $include$ [.30]
$NP \rightarrow Det Nominal$	[.20]	$prefer$ [.40]	
$NP \rightarrow Nominal$	[.15]	$Pronoun \rightarrow I$	[.40] she [.05]
$Nominal \rightarrow Noun$	[.75]	me [.15] you [.40]	
$Nominal \rightarrow Nominal Noun$	[.20]	$Proper-Noun \rightarrow Houston$	[.60]
$Nominal \rightarrow Nominal PP$	[.05]	NWA [.40]	
$VP \rightarrow Verb$	[.35]	$Aux \rightarrow does$	[.60] can [.40]
$VP \rightarrow Verb NP$	[.20]	$Preposition \rightarrow from$	[.30] to [.30]
$VP \rightarrow Verb NP PP$	[.10]	on [.20] $near$ [.15]	
$VP \rightarrow Verb PP$	[.15]	$through$ [.05]	
$VP \rightarrow Verb NP NP$	[.05]		
$VP \rightarrow VP PP$	[.15]		
$PP \rightarrow Preposition NP$	[1.0]		

2. (30 point) According to WordNet, 'Bolt' as a *noun* has multiple meanings including :
 - i) a bar that slides into a socket to fasten a door or window.
 - ii) a short, heavy arrow shot from a crossbow.
 - iii) a jagged white flash of lightning.

Propose two possible algorithms to determine the correct meaning of 'Bolt' in these three sentences :

- a) A bolt is a type of metal fastener.
- b) He was wounded in the shoulder by a crossbow bolt
- c) A stream of rain was splattering on the patio and then a bolt of lightning lit up the bedroom.



3. (30 point) Determine and explain the semantic role played by each noun phrase (underlined) in the following sentences:
- The police officer detained the suspect at the scene of the crime
 - A harbor is a sheltered area of water that is deep enough so that ships can anchor there.
 - When a person has no problems, the mind automatically finds a way to invent some.

~~ SELAMAT MENGERJAKAN DAN TUHAN MEMBERKATI ~~