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UJIAN AKHIR SEMESTER GENAP 2021 – 2022

Mata Kuliah	:	Natural Language Processing (TF4431)
Hari / Tanggal	:	Kamis / 23 Juni 2022
Waktu	:	180 menit (10.30 – 13.30 WIB)
Sifat Ujian	:	Open
Dosen	:	Dr. Ir. Endang Setyati, M.T

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- (40 point). Kindly refer to Case 1 and answer the following questions:
  - Generate possible parse trees for this sentence:  
"We discuss the talk with a chief with them"
  - Determine the most probable parse tree
  - For all parse trees, put head words on the tree branches.
  - Change the grammar to CNF and recalculate the probability of each production.
- (20 point) According to WordNet, 'fire' as a *verb* has multiple meanings including :
  - Cause to go off
  - Discharge from an office or positionPropose two possible algorithms to determine the correct meaning of 'FIRE' in these two sentences :
  - She fired the air rifle.
  - She fired her unfaithful employees
- (20 point) Determine and explain the semantic role played by each noun phrase (underlined) in the following sentences:
  - The knowledge of how speech sounds are organized in a particular language is called Phonology.
  - Read the text around the word to see if there are related words you can add to your map.
  - Semantic Analysis makes sure that declarations and statements of program are semantically correct.
- (20 point). Guessing Game:

Four persons (Dora, Boot, Diego, William) are sitting on a round table. Each person holds a card. The cards are: spade, heart, club, and diamond. The persons' sitting positions and the cards they are holding are randomized at the start of the game.

As a game player, you need to ask questions to guess correctly the four persons' sitting positions and their held cards. You ask the questions in English and the game system needs to translate them into queries in predicate logic language. Refer to CASE 2 for the list of predicates. Translate these questions to queries in predicate logic language:

  - Who is sitting on the right of the person holding the heart card?
  - What is the card held by the person sitting opposite Diego?

~~ All the best for your examination ~~



**Case Study :** We discuss the talk with a chief with them

### CASE 1: SIMPLE CFG

Grammar		Lexicon
S → NP VP	0,80	Det → that (0,10)   a (0,30)
S → Aux NP VP	0,10	the (0,50)   these (0,10)
S → VP	0,10	Noun → chief (0,20)   executive (0,20)
NP → Pronoun	0,30	talk (0,20)   team (0,30)
NP → Proper-Noun	0,30	lead (0,10)
NP → Det Nominal	0,20	Verb → book (0,20)   include (0,10)
NP → Nominal	0,20	talk (0,30)   discuss (0,40)
Nominal → Noun	0,40	Pronoun → I (0,10)   she (0,05)
Nominal → Adj Noun	0,35	he (0,30)   we (0,45)
Nominal → Nominal Noun	0,20	them (0,05)   you (0,05)
Nominal → Nominal PP	0,05	Proper-Noun → Indonesia (0,60)
VP → Verb	0,35	NWA (0,40)
VP → Verb NP	0,30	Aux → does (0,60)   can (0,40)
VP → Verb NP PP	0,10	Preposition → from (0,30)   to (0,30)
VP → Verb PP	0,15	on (0,25)   with (0,15)
VP → Verb NP NP	0,05	
VP → VP PP	0,05	
PP → Preposition NP	1,00	

### CASE 2: PREDICATE LOGIC

answer(A, _)	Always true; A on the left argument is the return value bound to the same variable A on the right argument.
person(P)	True if P is a person
card(C)	True if C is a card
left(P1, P2)	True if the second person (P2) is on the left of the first person (P1)
right(P1, P2)	True if the second person (P2) is on the right of the first parameter (P1)
hold(P, C)	True if the person (P) holds the card (C).