2019-1, 2019/5/10

오토마타 및 형식언어(COMP315)

Homework 3

Due date: 2019년 5월 17일

Late submission not allowed

How to submit: Upload the answers as one PDF file to LMS

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Q1, 6점) Chapter 5.1, Exercise 1 (pg. 138)

For $\Sigma = \{a, b\}$, 다음 조건을 만족하는 context free grammar (CFG)를 구하세요:

(a) $L = \{a^n b^n : n$은 짝수$\}$ $G_1 = (\{S\}, \{a,b\}, S, P)$, $P = \{S \to aaSbb \mid \lambda\}$.

(b) $L = \{a^n b^n : n$은 3의 배수$\}$ $G_1 = (\{S\}, \{a,b\}, S, P)$, $P = \{S \to aaaSbbb \mid \lambda\}$.

Q2, 6점) Chapter 5.2, Exercise 1, 10 (pg. 150)

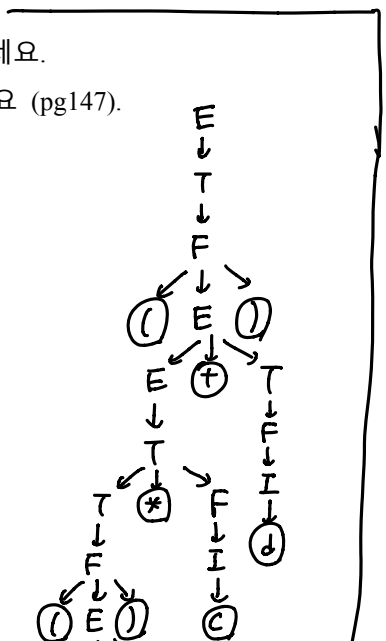
(a) 다음 grammar는 s-grammar인가요? 왜 그런지 설명하세요.

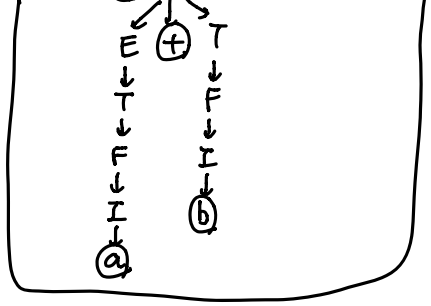
$S \to aS|bS|cA$

$A \to aA|bS$

S-grammar이다.
모든 production이 $A \to ax$ $(A \in V, a \in T, x \in V^*)$ 형태이고,
쌍 (A, a)가 한번씩 나타나기 때문이다.

(b) $((a + b) * c + d)$ 언를 표현하는 derivation tree를구하세요.
Example 5.12에 명시된 production rule들을 사용하세요 (pg147).





Q3, 8점) Chapter 5.2, Exercise 1, 3 (pg. 150)

(a) unit-production, useless production과 λ-production을 나타내는 간단한 production rule 예제들을 적으세요.

① $S \to A,\ A \to a$

② $S \to ab,\ A \to C.$

③ $S \to aAb,\ A \to \lambda.$

(b) 다음 grammar에서 모든 unit-production, useless production과 λ-production을 제거하세요.

$S \to aA|aBB,$ $\quad S \to a|aA|aB.$

$A \to aaA|\lambda,$ $\quad A \to aaA|aa$

$B \to bB|bbC,$ $\quad B \to bB.$

$C \to B$