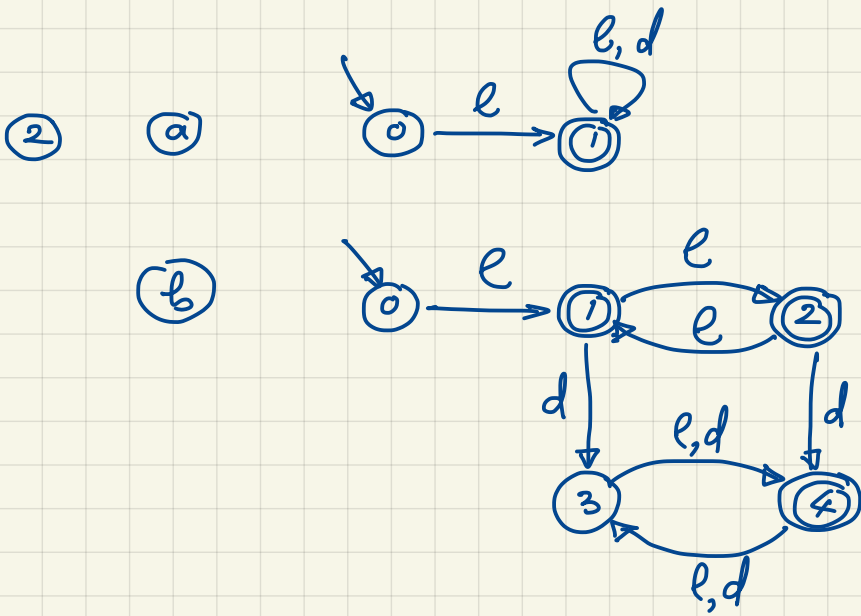


A1-sol.

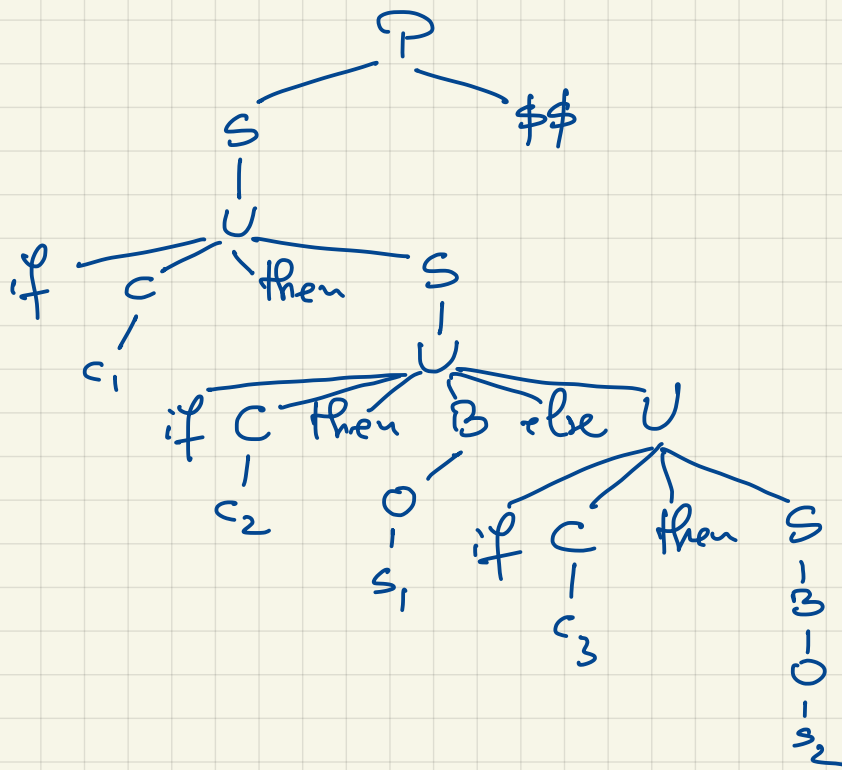


$$\textcircled{1} \#(\text{non-}\backslash n)^* \backslash n + \text{" " " " } ((\text{non-}\text{"})^* + \text{" } (\text{non-}\text{"})^+ + \text{" " } (\text{non-}\text{"})^+)^* \text{" " " " }$$



$l = \text{letter}, d = \text{digit}$

③ a



⑥

X	FIRST (X)	FOLLOW(X)
P	if, si	
S	if, si	\$\$
B	if, si	else, \$\$
U	if	\$\$
C	ci	then
O	si	else, \$\$

P	PREDICT(P)
1	if, si
2	if, si
3	if
4	if
5	si
6	if
7	if
8	ci
9	si

(c) G is not $LL(1)$ because productions 2 and 3 have the same LHS and $\text{if} \in \text{PREDICT}(2) \cap \text{PREDICT}(3)$. Productions 6 and 7 also have $\text{if} \in \text{PREDICT}(6) \cap \text{PREDICT}(7)$.

(d) Productions 6 and 7 have a common prefix and we try to solve it by left factoring.

$$U \rightarrow \text{if } C \text{ then } X$$
$$X \rightarrow S \mid B \text{ else } U$$

Productions 2 and 3 have no explicit common prefix, but an implicit one: $\text{if } C \text{ then}$. We try to solve this one:

$$S \rightarrow \text{if } C \text{ then } Y$$
$$Y \rightarrow B \text{ else } B$$
$$Y \rightarrow X$$

(e) Neither attempt above resolves the conflict. The problem is that $\text{if} \in \text{FIRST}(S) \cap \text{FIRST}(B) \cap \text{FIRST}(U) \cap \text{FIRST}(X) \cap \text{FIRST}(Y)$

As long as we have two productions by the same nonterminal that start with nonterminals from $\{S, B, U, X, Y\}$, we'll have the same conflict.