

3-6 (a) $S \rightarrow abS \mid bS \mid \varepsilon$.

该语言是正规的, 可用正规式 $(ab|b)^*$ 表示

(c) 用 S 推导 a, b 个数相等的串, 用 S' 推导 a, b 个数不相等的串
 用 A 推导 a 比 b 多一个的串, 用 A' 推导 a 比 b 多的串
 用 B 推导 b 比 a 多一个的串, 用 B' 推导 b 比 a 多的串

$$S' \rightarrow A' \mid B' \quad A' \rightarrow AA' \mid A \quad B' \rightarrow BB' \mid B$$

$$S \rightarrow aB \mid bA \mid \varepsilon \quad A \rightarrow aS \mid bAA \quad B \rightarrow bS \mid aBB$$

该语言不是正规的, 没有对应的正规式表示

3-8 $S \rightarrow (L) \mid a \quad L \rightarrow L, S \mid S$.

$$S \rightarrow (L) \mid a$$

$$L \rightarrow SL'$$

$$L' \rightarrow , SL' \mid \varepsilon$$

3-11

非终结符.	输入符号		
	a	b	$\$$
S	$S \rightarrow aBS$	$S \rightarrow bAS$	$S \rightarrow \$$
A	$A \rightarrow a$	$A \rightarrow bAA$	
B	$B \rightarrow aBB$	$B \rightarrow b$	

$$\text{FIRST}(S) = \{a, b, \varepsilon\}$$

$$\text{FIRST}(A) = \{a, b\}$$

$$\text{FIRST}(B) = \{a, b\}$$

$$\text{FOLLOW}(S) = \{\$, \varepsilon\}$$

$$\text{FOLLOW}(A) = \{a, b, \$\}$$

$$\text{FOLLOW}(B) = \{a, b, \$\}$$

3.12 对于 $P \rightarrow dP \mid \epsilon$.

$$\text{FIRST}(dP) = \{d\}$$

$$\text{FIRST}(\epsilon) = \{\epsilon\}.$$

$$\text{FOLLOW}(dP) = \{\$ \}$$

$$\text{满足 } \text{FIRST}(dP) \cap \text{FIRST}(\epsilon) = \emptyset$$

$$\text{FIRST}(dP) \cap \text{FOLLOW}(dP) = \emptyset$$

对于 $Q \rightarrow aQ \mid \epsilon$.

$$\text{FIRST}(aQ) = \{a\}$$

$$\text{FIRST}(\epsilon) = \{\epsilon\}.$$

$$\text{FOLLOW}(aQ) = \{\$ \}$$

$$\text{满足 } \text{FIRST}(aQ) \cap \text{FIRST}(\epsilon) = \emptyset$$

$$\text{FIRST}(aQ) \cap \text{FOLLOW}(aQ) = \emptyset$$

对于 $S \rightarrow AB \mid PQx$

$$\text{FIRST}(AB) = \{x\}$$

$$\text{FIRST}(PQx) = \{d, a, x\}.$$

$$\text{FIRST}(AB) \cap \text{FIRST}(PQx) = \{x\}$$

\therefore 该文法不是 LL(1) 文法.