

计算理论 Homework 4 展翼飞 3190102196

4.1.2

(a) $(q_0, \triangleright a \underline{b} b \sqcup b b \sqcup \sqcup a b a) \vdash_M (q_0, \triangleright a b \underline{b} \sqcup b b \sqcup \sqcup a b a)$
 $\vdash_M (q_0, \triangleright a b b \sqcup b b \sqcup \sqcup a b a)$
 $\vdash^*_M (q_0, \triangleright a b b \sqcup b b \sqcup \sqcup \underline{a} b a)$
 $\vdash_M (q_0, \triangleright a b b \sqcup b b \sqcup \sqcup a \underline{b} a)$
 $\vdash^*_M (q_0, \triangleright a b \underline{b} \sqcup b b \sqcup \sqcup a b a)$
 $\vdash_M (q_2, \triangleright a b b \sqcup b b \sqcup \sqcup a b a)$
 $\vdash_M (h, \triangleright a b b \sqcup b b \sqcup \sqcup a b a)$

(b) first scan from left to right until meet first a ,
 then turn left find first b , then turn right find first \sqcup ,
 then halt on the \sqcup .

4.1.7

$K = \{q_0, q_1, h\}$ $\Sigma = \{a, b, \sqcup, \triangleright\}$ $s = q_0$ $H = \{h\}$

δ :

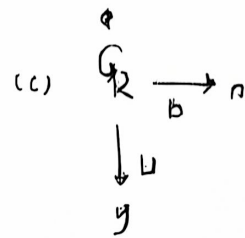
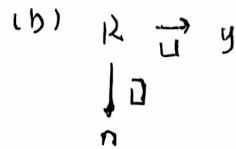
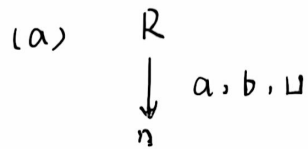
q	σ	$\delta(q, \sigma)$
q_0	a	(q_1, \rightarrow)
q_0	b	(q_0, \rightarrow)
q_0	\sqcup	(q_0, \rightarrow)
q_0	\triangleright	(q_0, \rightarrow)
q_1	a	(h, a)
q_1	b	(q_0, \rightarrow)
q_1	\sqcup	(q_0, \rightarrow)
q_1	\triangleright	(q_0, \rightarrow)

4.1.10

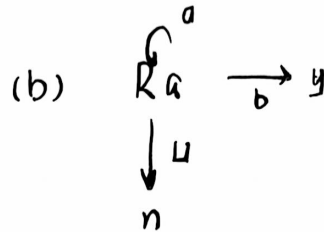
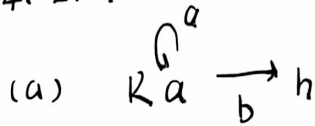
It scans to right and put the first and second nonblank symbols to first and second blanks behind



4.2.2



4.2.4



(c) no

4.6.2

(a) $V = \{a, b, A, B, s, T, U, [,], \$, \lambda\}$

$\Sigma = \{a, b\}$

$R = \{ s \rightarrow [T]$

$T \rightarrow xTx$

$T \rightarrow \$U$

$Ux \rightarrow AaU$

$Ux \rightarrow BbU$

$x A \rightarrow A x$

$x B \rightarrow B x$

$[A \rightarrow a[$

$[B \rightarrow b[$

$[\$ \rightarrow e$

$] \rightarrow e \}$

4.7.2

(a) $\text{factoria}(n)$ is recursively defined by

$$\begin{cases} g(0) = 1 \\ h(m, r) = (m+1) \cdot r \end{cases}$$

$$(b) \text{gcd}(m, n) = \begin{cases} n, & \text{rem}(m, n) = 0 \\ \text{gcd}(n, \text{rem}(m, n)) \end{cases}$$

