计算理论 Homework3 3190102190 庞墨飞

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3.1.3 (c)

$G=(V,\Sigma,R,S)$: $V=\{a,b,S\}$ $\Sigma=\{a,b\}$

$R=\{S\to aSa,\ S\to bSb,\ S\to a,\ S\to b,\ S\to e\}$

3.1.9 (a)

$V=\{a,b,S\}$ $\Sigma=\{a,b\}$ $R=\{S\to aSb,\ S\to aS,\ S\to e\}$

(b) $V=\{a,b,c,d,S\}$ $\Sigma=\{a,b,c,d\}$

$R=\{S\to asc,\ S\to aSd,\ S\to bSc,\ S\to bSd\}$

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3.3.2 (c) $M=(K,\Sigma,\Gamma,\Delta,s,F)$

$K=\{q,r\}$ $\Sigma=\{a,b\}$ $\Gamma=\{a,b\}$ $F=\{r\}$

$\Delta=\{((q,a,e),(q,a)),\ ((q,b,e),(q,b))$

$((q,e,e),(r,e)),\ ((q,a,e),(r,e))$

$((q,b,e),(r,e)),\ ((q,a,a),(r,e))$

$((q,b,b),(r,e))\}$

(d) $K=\{q\}$ $\Sigma=\{a,b\}$ $\Gamma=\{A,a,b\}$ $F=\{q\}$

$\Delta=\{((q,a,e),(q,A)),\ ((q,b,e),(q,b))$

$((q,a,b),(q,a)),\ ((q,b,A),(q,a))$

$((q,b,a),(q,e))\}$

P142 3.4.1

$M = \{K, \Sigma, \Gamma, \Delta, s, F\}$

$K = \{p, q\}$ $\Sigma = \{(,)\}$ $\Gamma = \{(,), s\}$ $s = p$ $F = \{q\}$

$\Delta = \{((p, e, e), (q, s)), ((q, e, s), (q, ss)),$
$((q, e, s), (q, (s))), ((q, e, s), (q, e)),$
$((q, (, (), (q, e)), ((q,),), (q, e))\}$

$((p, (()()), e) \vdash_M (p, (()()), s) \vdash_M ((p, ((())), s))$

$\vdash_M ((p, ()()), s)) \vdash_M ((p, ()()), ss))$

$\vdash_M ((p, ()()), (s)s)) \vdash_M ((p,)()), s)s))$

$\vdash_M ((p,)()),)s)) \vdash_M ((p, ()), s)) \vdash_M ((p, ()), (s)))$

$\vdash_M ((p,)),)) \vdash_M ((p,),)) \vdash_M (p, e, e)$

P148 3.5.1

(b) $\{a, b\}^* - \{a^n b^n : n \geq 0\} \Leftrightarrow \{a^m b^n \mid m \neq n\} \cup$
$(a^* b^* a^*)^* \cup (b^* a^* b^*)^*$
The union of CFL. so $\{a, b\}^* - \{a^n b^n . n \geq 0\}$ is C

(c) $L = \{a^* b^n c^* d^n : n \geq 0\} \cup \{a^m b^* c^n d^* : m \leq n\}$
$\cup \{a^m b^n c^p d^q : m+n = p+q\}$ The union of CFL

(d)

3.5.14

(a) context free. It's a union of CFL

(b) context free. It's a union of CFL

(c) not context free. equals to $a^n b^n c^n$

(d) context free. It's a union of CFL

(逐)

3.5.15

(1) context-free $L-R = L \cap \overline{R}$

(2) R-L is not certain