BİÇİMSEL DİLLER VE OTOMATA TEORİSİ
FİNAL ÖDEV 2-

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Problem 3.1.1

(a) aa, baa, aba, aab, aaa

(b) • $S \Rightarrow AA \Rightarrow bAA \Rightarrow bAAb \Rightarrow bAbAb \Rightarrow bAbbAb \Rightarrow bAbbAb \Rightarrow babbAb \Rightarrow babbab$

• $S \Rightarrow AA \Rightarrow bAA \Rightarrow bAAb \Rightarrow bAbAb \Rightarrow bAbbAb \Rightarrow bAbbab \Rightarrow babbab$

• $S \Rightarrow AA \Rightarrow bAA \Rightarrow bAbA \Rightarrow babA \Rightarrow babbA \Rightarrow babbAb \Rightarrow babbab$

• $S \Rightarrow AA \Rightarrow AAb \Rightarrow bAAb \Rightarrow baAb \Rightarrow babAb \Rightarrow babbAb \Rightarrow babbab$

(c)
$$\begin{aligned}
S &\Rightarrow AA \\
&\Rightarrow^{m} b^{m}AA \\
&\Rightarrow^{n} b^{m}Ab^{n}A \\
&\Rightarrow^{p} b^{m}Ab^{n}Ab^{p} \\
&\Rightarrow b^{m}ab^{n}Ab^{p} \\
&\Rightarrow b^{m}ab^{n}ab^{p}.
\end{aligned}$$

Problem 3.1.2

$$\begin{aligned}
S &\Rightarrow bAb \\
&\Rightarrow bSSb \\
&\Rightarrow baAaSb \\
&\Rightarrow baSSaSb \\
&\Rightarrow baSaSb \\
&\Rightarrow baaSb \\
&\Rightarrow baabbAbb \\
&\Rightarrow baabSSbb \\
&\Rightarrow baabSbb \\
&\Rightarrow baabbb.
\end{aligned}$$

Problem 3.1.3

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

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

$R = \{ S \to aSa,$
$S \to bSb,$
$S \to c \}$

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3.1.3

(b) $G=(V,\Sigma,R,S)$

$V=\{a,b,S\}$

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

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

(c) $G=(V,\Sigma,R,S)$

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

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

Problem 3.1.8

$G=(V,\Sigma,R,S)$

V={ :=, <, lbl:, ;, if, then, while, do, begin, end, +, *, (,), id, T, F, E, S, M}

Σ={ :=, <, lbl, ;, if, then, while, do, begin, end, +, *, (,), id}

R={ S→id :=E,
S→if E<E then S,
S→while E <E do S,
S→goto lbl,
S→begin M end,
S→lbl:S,
M→S;M,
E→E+T,
E→T,
T→T*F,
T→F,
F→(E),
F→id}.

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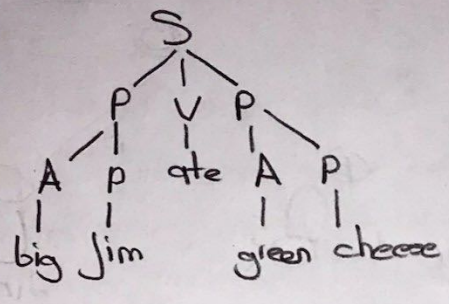
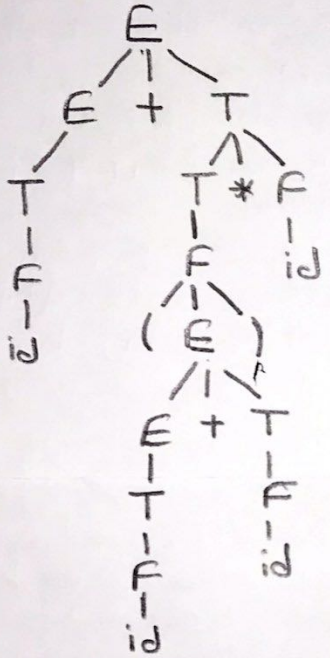
Problem 3.2.4

(a)



(b)



(c)