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Section: BCS-5B

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Assignment: 2

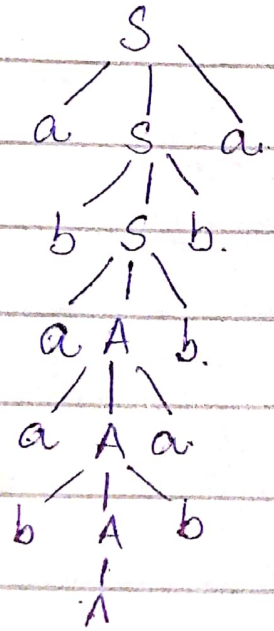
Course: Theory of Automata.

4.1 (f)

$S \rightarrow aSa \mid bSb \mid aAb \mid bAa$

$A \rightarrow aAa \mid bAb \mid a \mid b \mid \Lambda$

$L = \{ S \mid S \in (a,b)^* \text{ and } S \text{ is not a palindrome} \}$



$S \rightarrow abaabbabba$

4.3(b) The set of even-length strings in $\{a,b\}^*$, with the two middle symbols equal.

$S \to aSb \mid bSa \mid aSa \mid bSb \mid aa \mid bb$

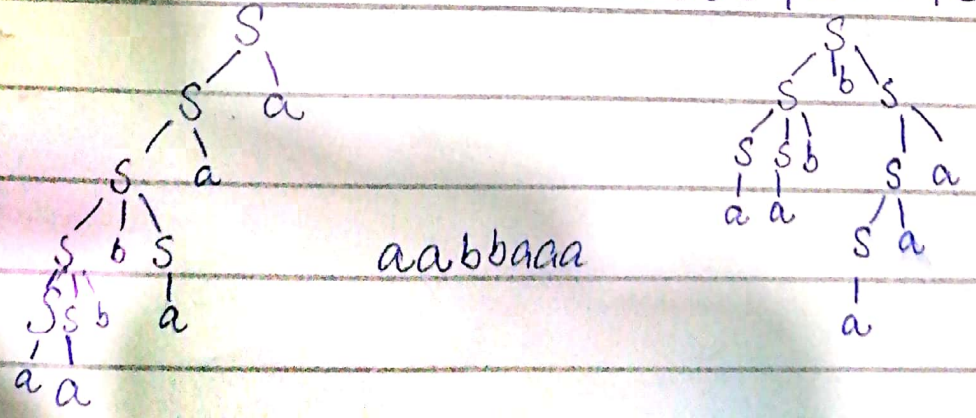
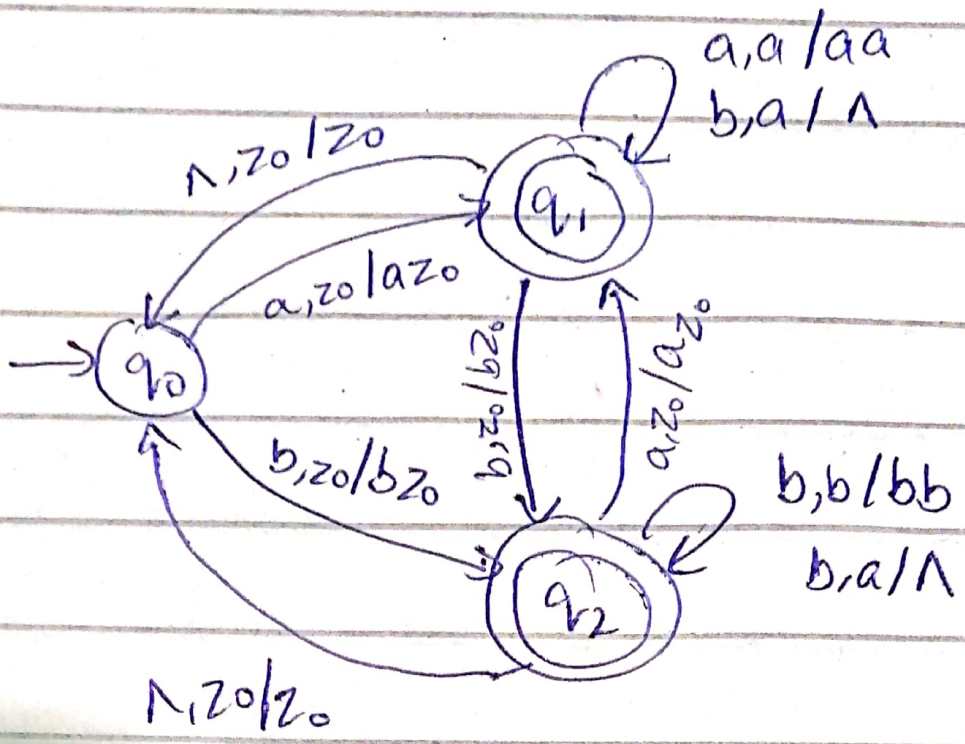
4.10 (d) $\{a^i b^j \mid i \le j \le 2i\}$

$S \to aSb \mid aSbb \mid \Lambda$

4.12 $\{a^i b^j c^k \mid i \neq j+k\}$

$S \to A \mid B$
$A \to aX$
$X \to aX \mid aXc \mid Y$
$Y \to aY \mid aYb \mid \Lambda$
$B \to Mc \mid b$
$M \to Mc \mid aMc \mid N$
$N \to Nb \mid aNb \mid \Lambda$

4.34 $S \to a \mid Sa \mid bSS \mid SSb \mid SbS$



5-18 (b) $\{x \in \{a,b\}^* \mid n_a(x) \neq n_b(x)\}$