

2.6c $\{ w \# x \mid w^R \text{ is a substring of } x. \text{ For } w \text{ and } x \in \{0,1\}^* \}$

$$w \# \overbrace{(0ui)^* w^R (0ui)^*}^x$$

$$\{ w \# w^R \mid w \in \{0,1\}^* \} \parallel 10\#01$$

$$S \rightarrow 0S0 \mid 1S1 \mid \#$$

$$(0ui)^* \quad A \rightarrow 0A \mid 1A \mid \varepsilon$$

$$w(0ui)^* w^R$$

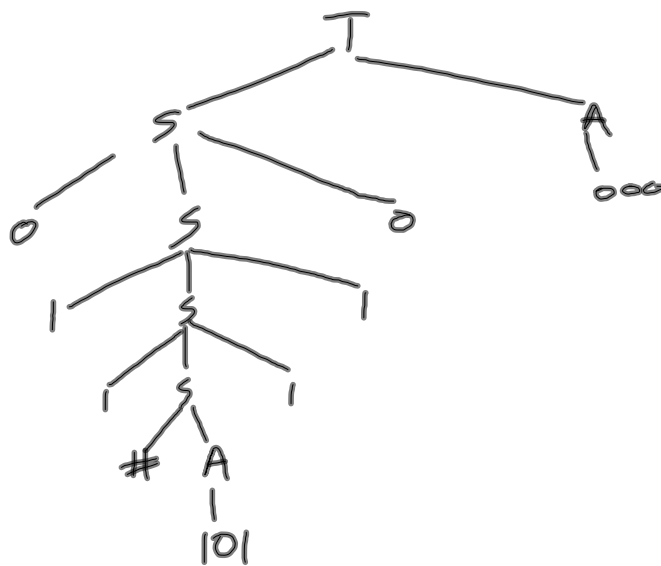
$$S \rightarrow 0S0 \mid 1S1 \mid \#A$$

$$\# w(0ui)^* w^R (0ui)^*$$

$$T \rightarrow SA$$

011#101110000

$\underbrace{\hspace{2em}}_w \quad \underbrace{\hspace{2em}}_{w^R}$



Grammars

a^*
 A^*

$(a \cup b)$

ab

$(A \cup B)$

AB

Larg.	start
A	S_A
B	S_B
$S \rightarrow S_A \mid S_B$	

$w w^R$
 $w \neq w^R$
palindromes

$\{ w \mid w = w^R \}$

$1^n 0 1^n$

2.5

a. $\{w \mid w \text{ contains at least 3 1s}\}$

b. $\{w \mid w \text{ starts and ends w/ same symbol}\}$

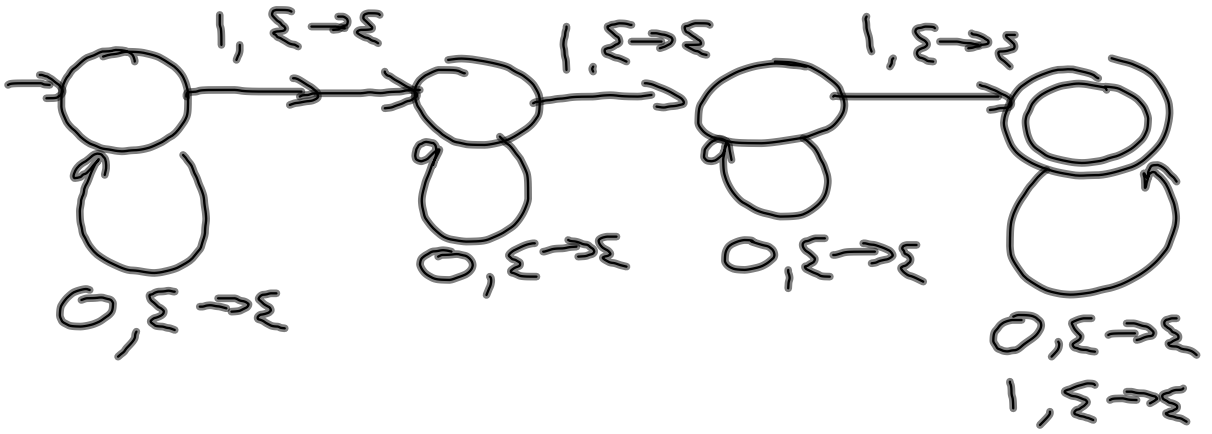
c. $\{w \mid \text{length of } w \text{ is odd}\}$

d. $\{w \mid \text{length is odd and middle symbol is } 0\}$

e. $\{w \mid w = w^R\}$

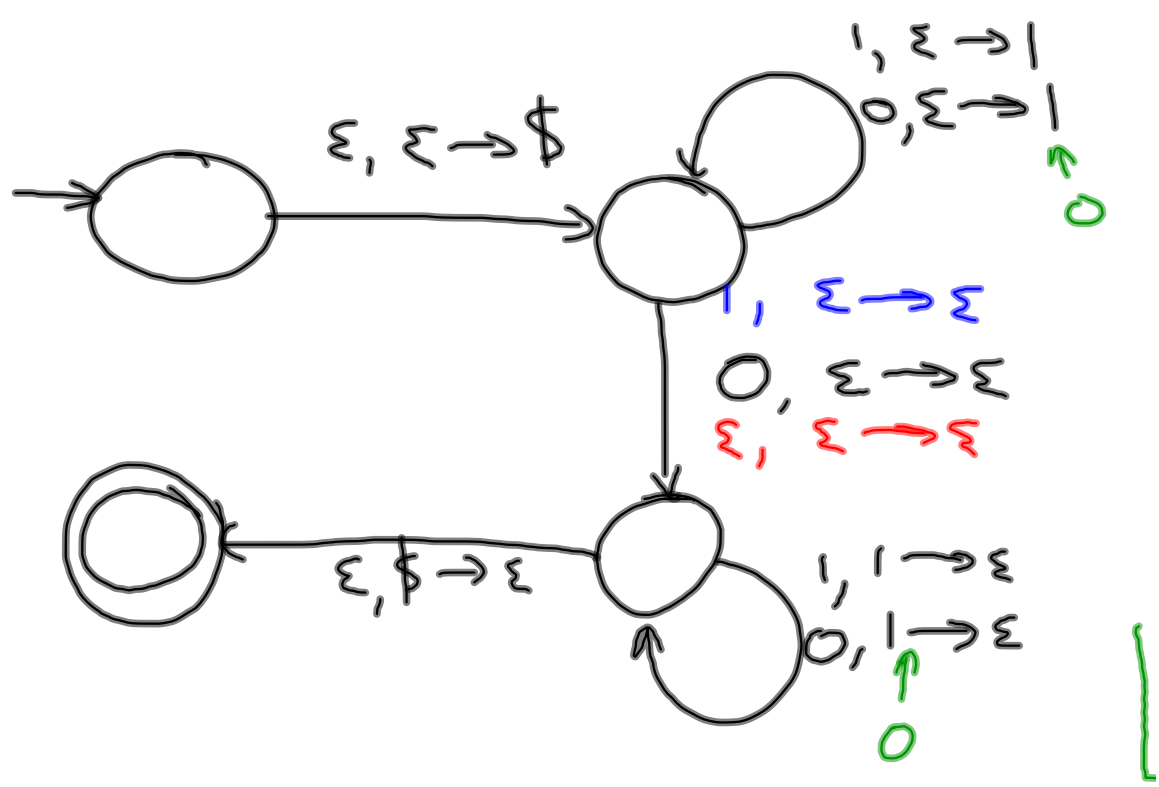
f. empty

a.



$1, a \rightarrow b$

d.



$w O w^R$
 odd pal:ndrome
 all pal:ndrome