

HW#2 Connor Marker Theory of Computer Science

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1a) Grammar = $\{V, \Sigma, R, S\}$

$$V = \{S\}$$

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

$$R = S \rightarrow aSb | ab$$

$$S =$$

2a)

$$\begin{aligned} S &\rightarrow T_a M_1 \\ S &\rightarrow T_a T_b \\ T_a &\rightarrow a \\ T_b &\rightarrow b \\ M_1 &\rightarrow ST_b \end{aligned}$$

1b) Grammar = $\{V, \Sigma, R, S\}$

$$V = \{S\}$$

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

$$R = S \rightarrow aSb | b$$

$$S = S$$

2b)

$$\begin{aligned} S &\rightarrow T_a M_1 \\ S &\rightarrow b \\ T_a &\rightarrow a \\ T_b &\rightarrow b \\ M_1 &\rightarrow ST_b \end{aligned}$$

1c) Grammar = $\{V, \Sigma, R, S\}$

$$V = \{S\}$$

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

$$R = S \rightarrow aSb | a$$

$$S = S$$

2c)

$$\begin{aligned} S &\rightarrow T_a M_1 \\ S &\rightarrow a \\ T_a &\rightarrow a \\ T_b &\rightarrow a \\ M_1 &\rightarrow ST_b \end{aligned}$$

$$3a) \quad S \rightarrow aAB$$

$$A \rightarrow bBb/bb$$

$$B \rightarrow A$$

$$S \rightarrow aAB/aA$$

$$A \rightarrow bBb/bb$$

$$B \rightarrow A$$

$$S \rightarrow aAB/aA$$

$$A \rightarrow bBb/bb$$

$$B \rightarrow bBb/bb$$

$$S \rightarrow T_aAB/T_aA$$

$$A \rightarrow T_bB^+b/T_bT^+b$$

$$B \rightarrow T_bB^+T_b^+/bT^+b$$

$$T_a \rightarrow a$$

$$T_b \rightarrow b$$

$$S \rightarrow T_aM_1/T_aA$$

$$A \rightarrow T_bM_2/T_bT^+b$$

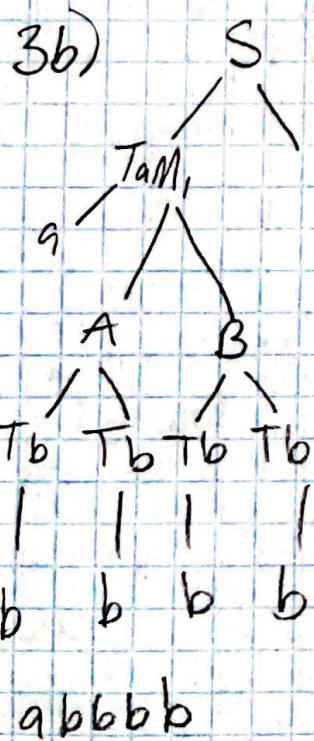
$$B \rightarrow T_bM_2/T_bT^+b$$

$$T_a \rightarrow a$$

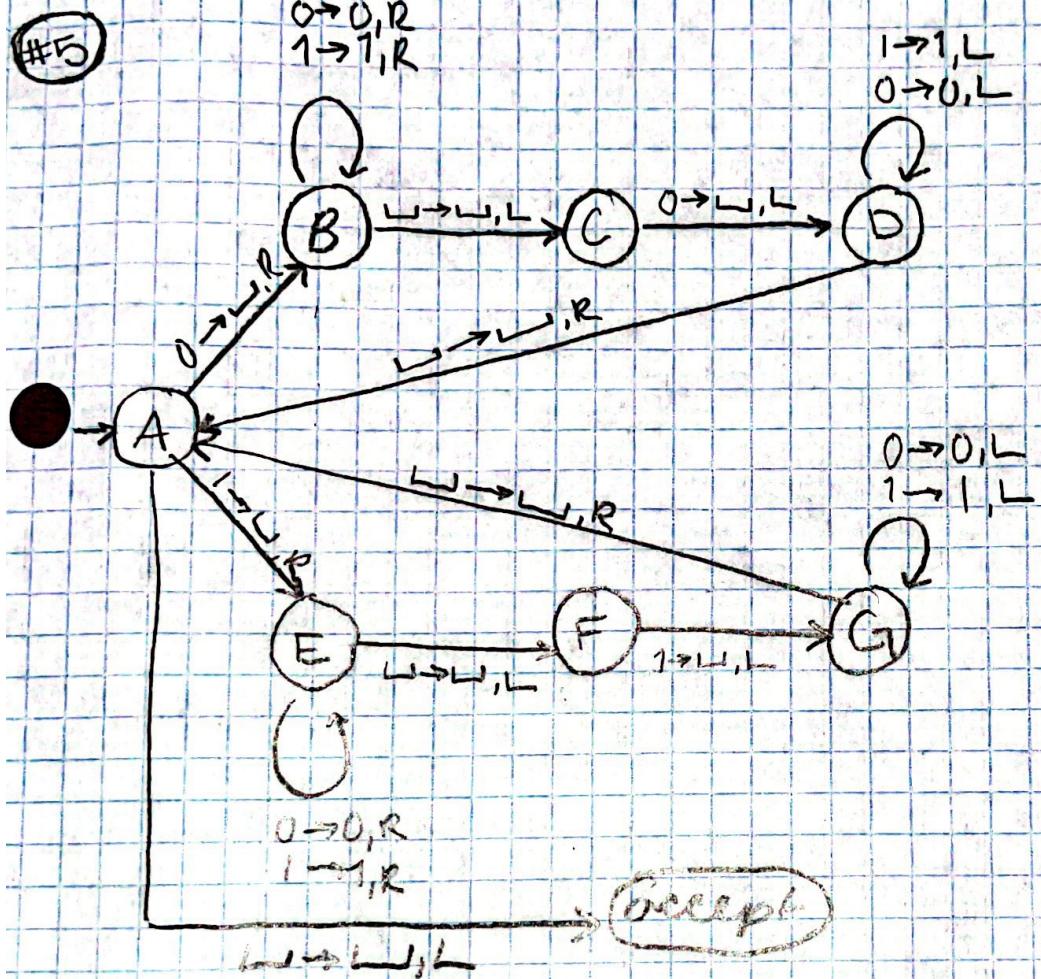
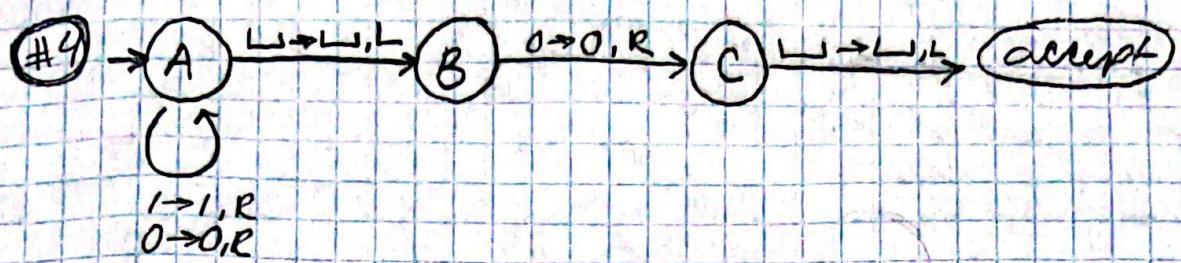
$$T_b \rightarrow b$$

$$M_1 \rightarrow AB$$

$$M_2 \rightarrow BT^+b$$

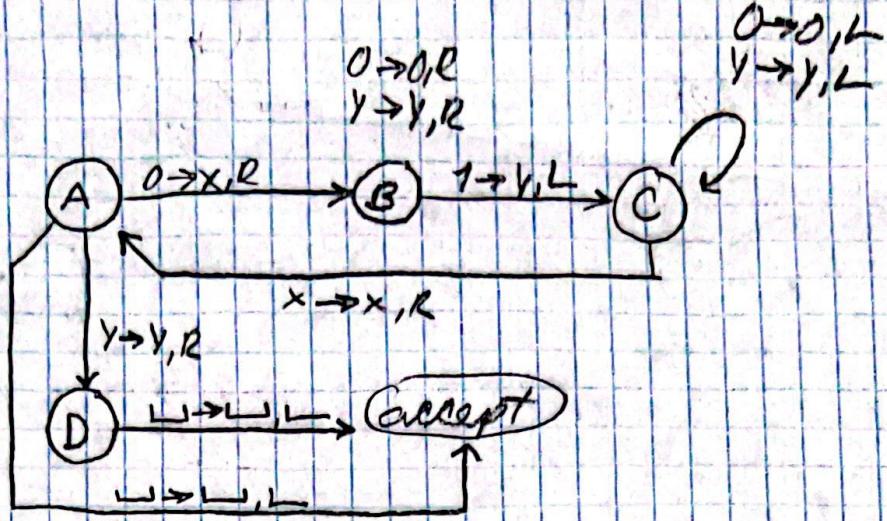


Turing Machines - Section

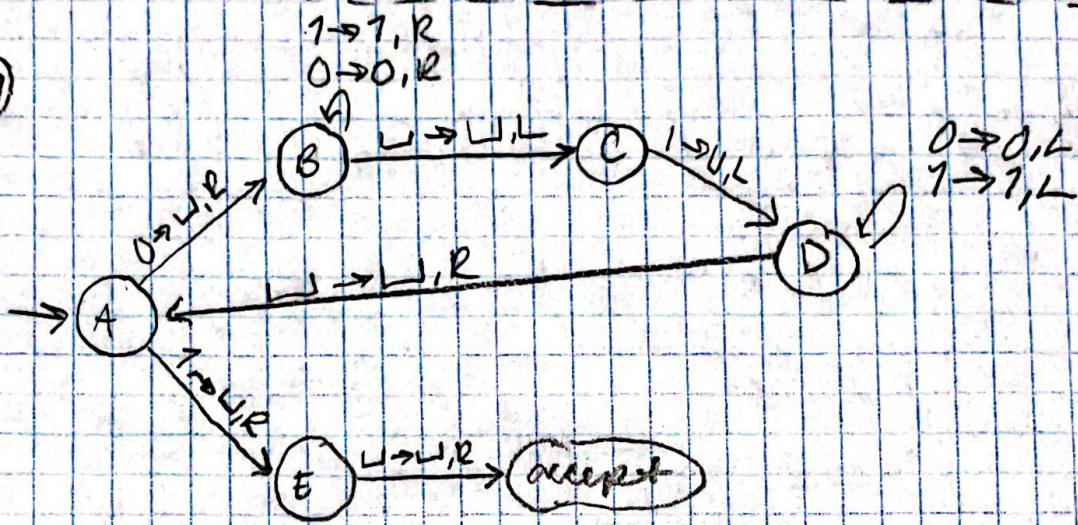


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