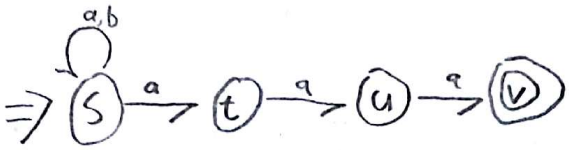
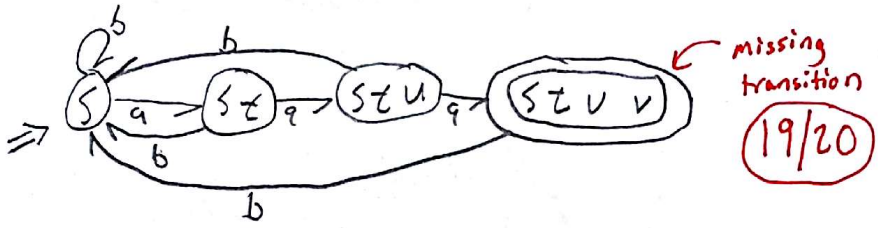
Cahlen Branchean HW3

71/100

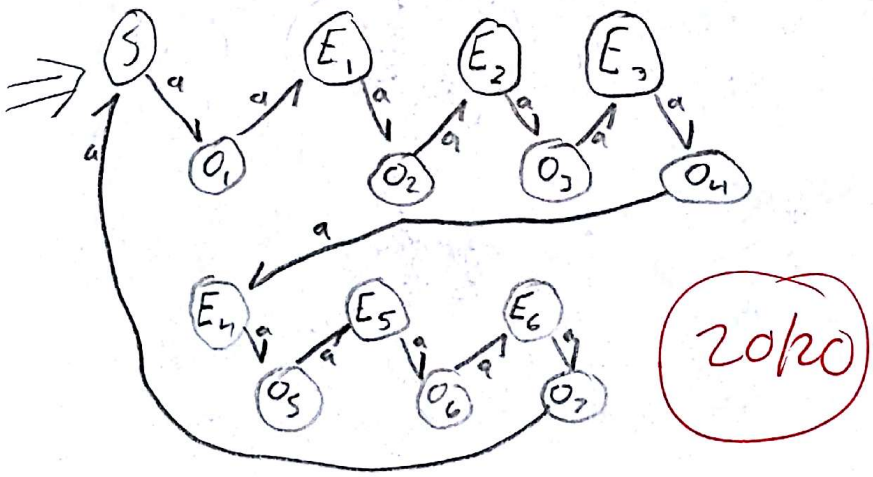
17)




19/20

22)

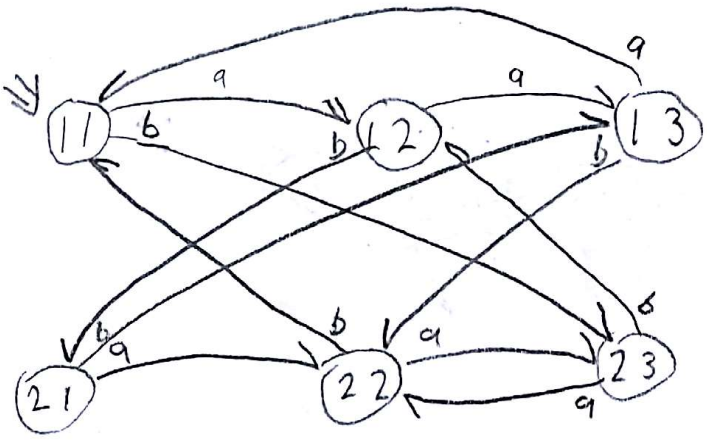



20/20

$F = \{ S, E_1, E_2, E_3, E_4, E_5, E_6, O_4 \}$

23)

$\{1,2\} \times \{1,2,3\} = \{11, 12, 13, 21, 22, 23\}$




$F = \{23\}$

24)

Same as above $F = \{21, 22, 23, 13\}$

20/20

20)

Basis

$$(A^0)_{uv} = I_{uv}$$

$$= \begin{cases} \{\lambda\} & \text{if } u = v \\ \emptyset & \text{otherwise} \end{cases}$$

$$= \{ x \in \Sigma^* \mid |x| = 0 \text{ and } \hat{\delta}(u,x) = v \}$$

Induction

$$(A^{n+1})_{uv} = (A^n A)_{uv}$$

$$= \bigcup_{w \in Q} (A^n)_{uw} A_{wv}$$

$$= \bigcup_{w \in Q} \{x \in \Sigma^* \mid |x| = n \text{ and } \hat{\delta}(u,x) = w\} \cdot \{a \in \Sigma \mid \delta(w,a) = v\}$$

$$= \{ xa \in \Sigma^* \mid |x| = n \text{ and } \exists w\, \hat{\delta}(u,x) = w \text{ and } \delta(w,a) = v \}$$

$$= \{ xa \in \Sigma^* \mid |x| = n \text{ and } \hat{\delta}(u,xa) = v \}$$

$$= \{ y \in \Sigma^* \mid |y| = n+1 \text{ and } \hat{\delta}(u,y) = v \}$$

Answer is in the back of the book. followed as best I could but could not reproduce this on my own.

18) I Feel like I have some of this, but I dont know if I have 30%. So I'll just say I don't know.

19) I don't know. 6/20

21) I don't know

6/20