Math 322

Q15. (13.2 #11)

v : Valid id
i : invalid id
p : valid pwd
q : invalid pwd

a : "enter ID"
b : "enter PWD"
c : prompt
x : any input

	f					a				
	v	p	i	q	x	v	p	i	q	x
S_0	S_1	S_2	S_3	b	b
S_1						(see video!)
S_2				
S_3				

13.3 F.S.A.
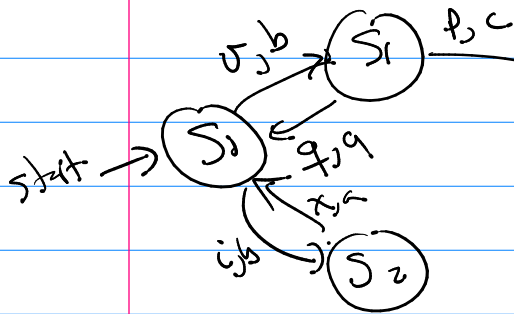
Know: $L(M)$, det vs non-det

given non-det $\rightarrow$ make a det FSA

13.4 Language Recognition
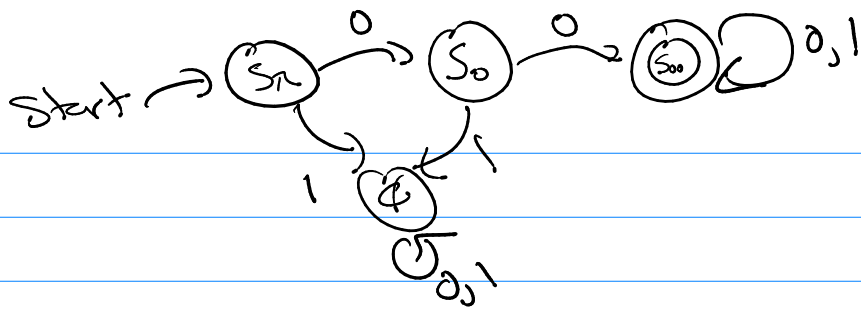
given a language (set of strings of symbols)

① Make an F.S.A to recognize it?

② find productions of a grammar that generate it?

Ex $L = 00\{0,1\}^*$

FSA

Start → (S_1) →0→ (S_0) →0→ (S_{00}) ⟲ $0,1$

S_1 →1→ (E), S_0 →1→ (E), E ⟲ $0,1$

Grammar:

$$S \rightarrow 00C$$
$$C \rightarrow 1C$$
$$C \rightarrow 0C$$
$$C \rightarrow \lambda$$

Look at a specific type of language...

Def   a regular set is inductively defined by

① **Basis:** $\{\ \}$ is regular

        $\{\lambda\}$ is regular

        $\{x\}$ is regular $x \in I$

② if A, B are regular

      then: $AB, A \cup B, A^*$ are regular

So $\{0, 01^*, 0\{0,1\}10^A, \lambda\}$ is regular

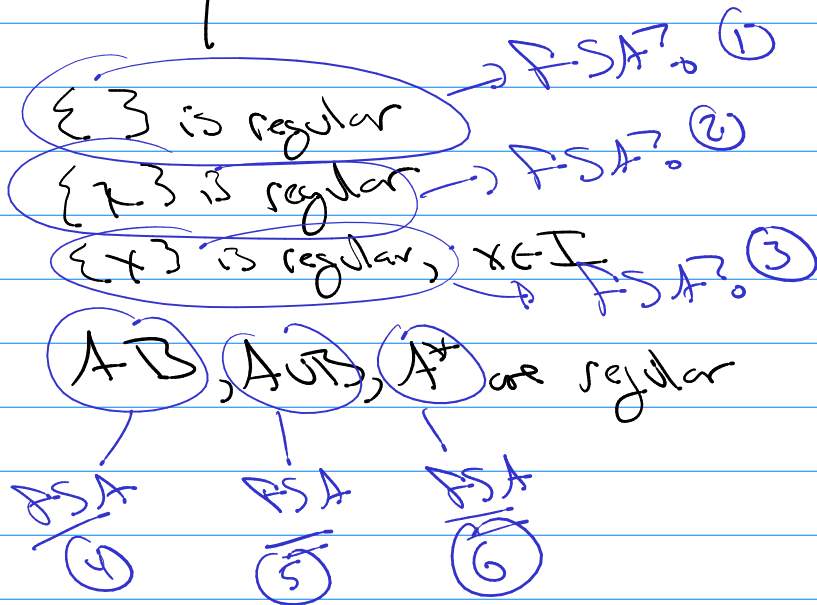and $\{0^n 1^n, n \geq 1\}$ is **not** regular

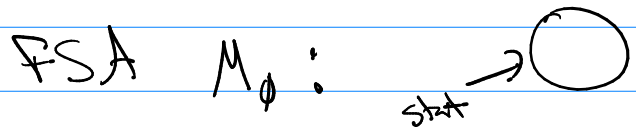 $\lambda, 01, 0011, 000111, --$

regular sets

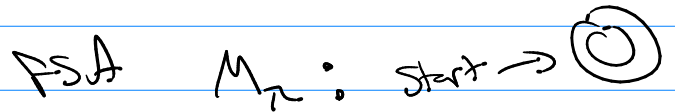given a language $\longrightarrow$ Make a F.S.A?

Thm Kleene's thm

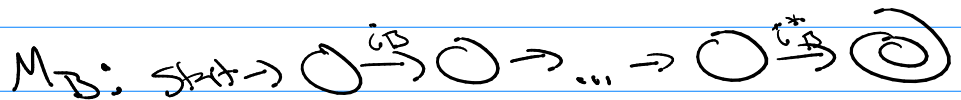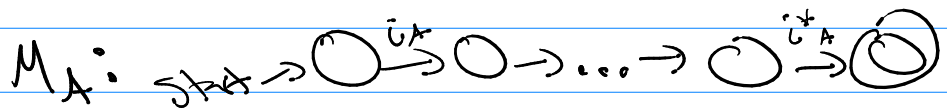a set is regular (iff) it is recognized by a F.S.A

$\{\ \}$ is regular $\longrightarrow$ F.S.A? ①

$\{\lambda\}$ is regular $\longrightarrow$ F.S.A? ②

$\{x\}$ is regular, $x \in I$ $\longrightarrow$ F.S.A? ③

AB , $A \cup B$, A^* are regular

FSA ④   FSA ⑤   FSA ⑥

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① $\{\ \}$ is regular   FSA $M_\emptyset$: start $\longrightarrow \bigcirc$

② $\{\lambda\}$ is regular   FSA M_λ : start $\longrightarrow \circledcirc$

③ $\{x\}$ is regular   FSA M_x : start $\longrightarrow \bigcirc \xrightarrow{x} \circledcirc$
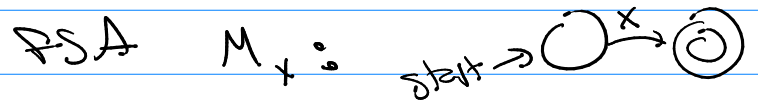
assume: A, B are regular and have Machines

M_A : start $\longrightarrow \bigcirc \xrightarrow{i_A} \bigcirc \longrightarrow \ldots \longrightarrow \bigcirc \xrightarrow{i^*_A} \circledcirc$

M_B : start $\longrightarrow \bigcirc \xrightarrow{i_B} \bigcirc \longrightarrow \ldots \longrightarrow \bigcirc \xrightarrow{i^*_B} \circledcirc$

④ M_{AB} : ?   ⑤ $M_{A \cup B}$: ?   ⑥ M_{A^*} : ?

$M_{A \cup B}$:

i_A

i_A

i_A^*

M_A

start

i_B

i_B

c_1^*

M_B