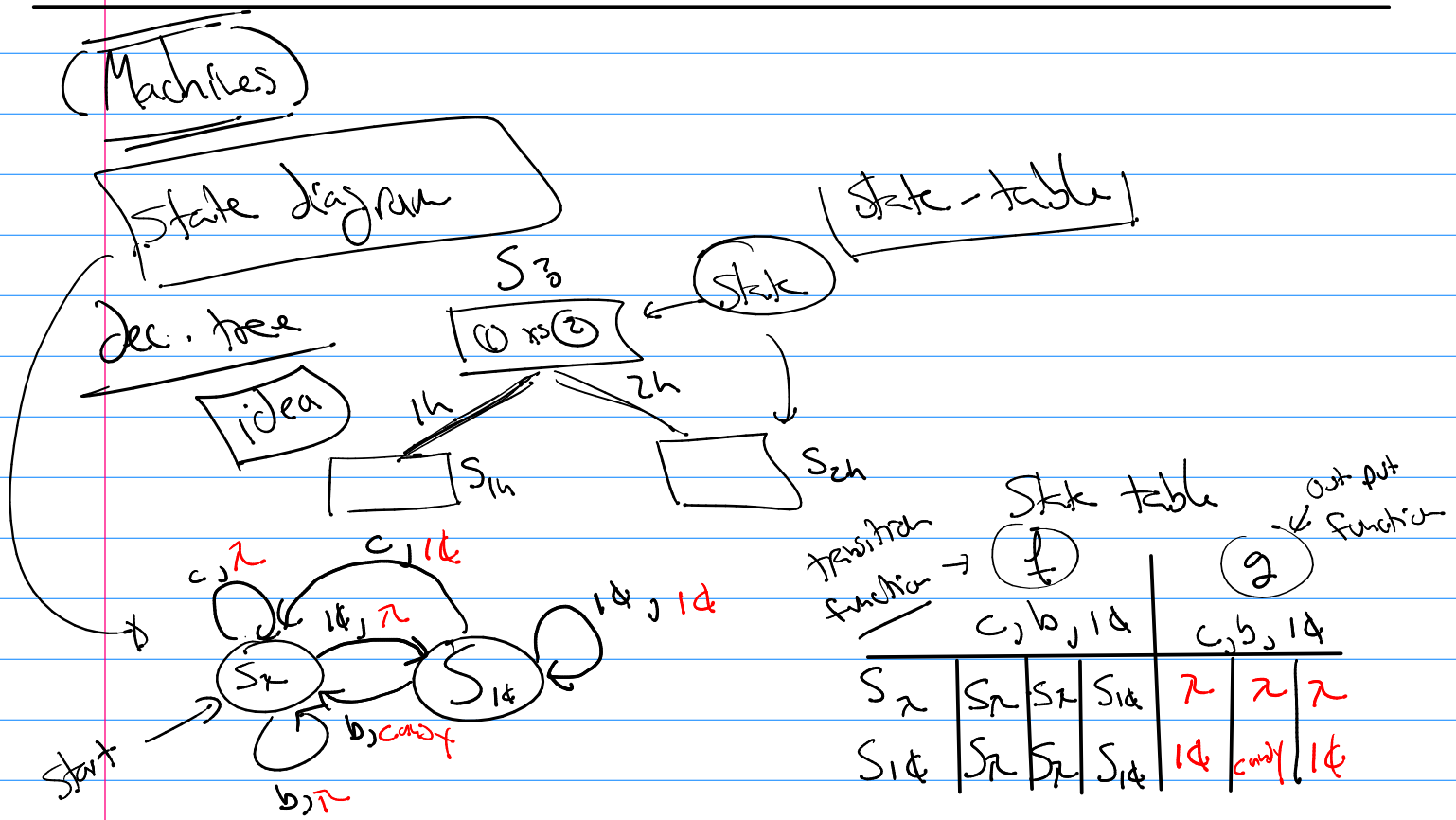
Math 322

Machines



Finite State Machine with output

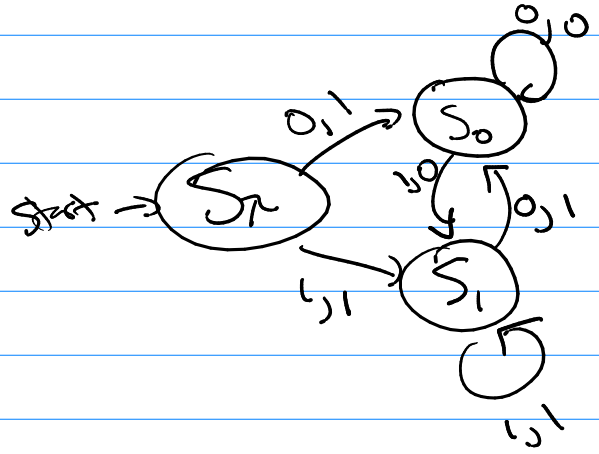
$$M = (S, I, O, f, g, s_0)$$

- S: set of states
- I: input Alphabet
- O: output Alphabet
- $f: S \times I \to S$ transition function
- $g: S \times I \to O$ output function
- $s_0 \in S$ is the start state

Unit delay

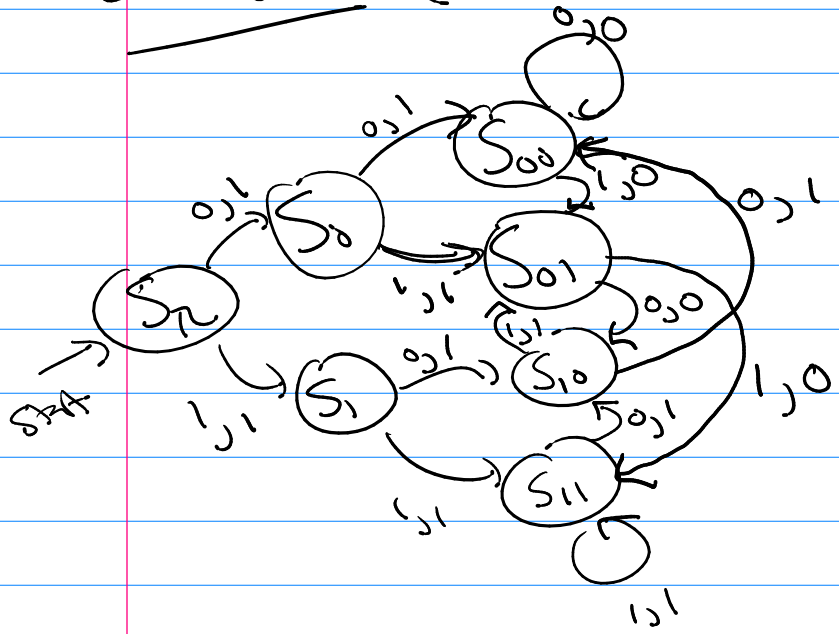
input string ex. 011010...

output string $M(011010\ldots) = 1011010\ldots$



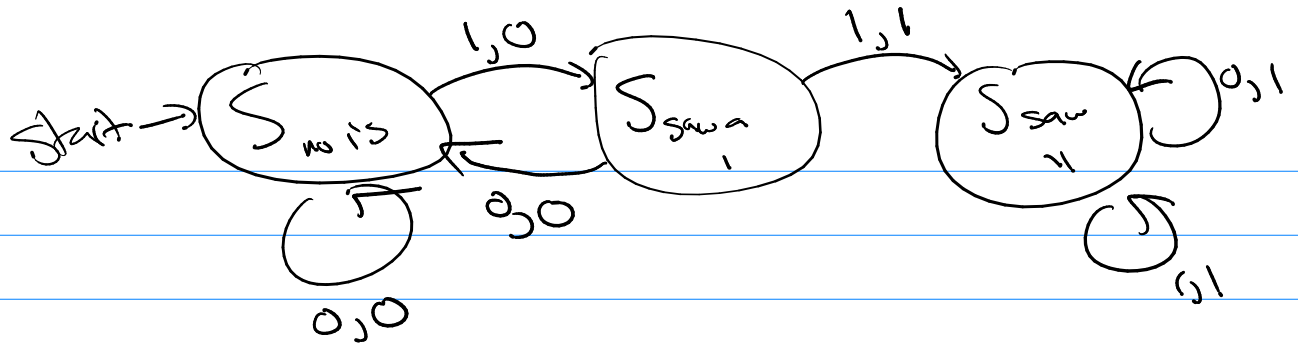
	f		g	
	0	1	0	1
S_λ	S_0	S_1	1	1
S_0	S_0	S_1	0	0
S_1	S_0	S_1	1	1

2bit delay (ex 11)



Def: M recognizes an input string if its last output symbol is a 1.

Ex Make finite state machine without that recognizes all strings with a 11 in them



B.3 Finite State Machine without output

Finite State Automata

$$M = (S, I, f, s_0, F)$$

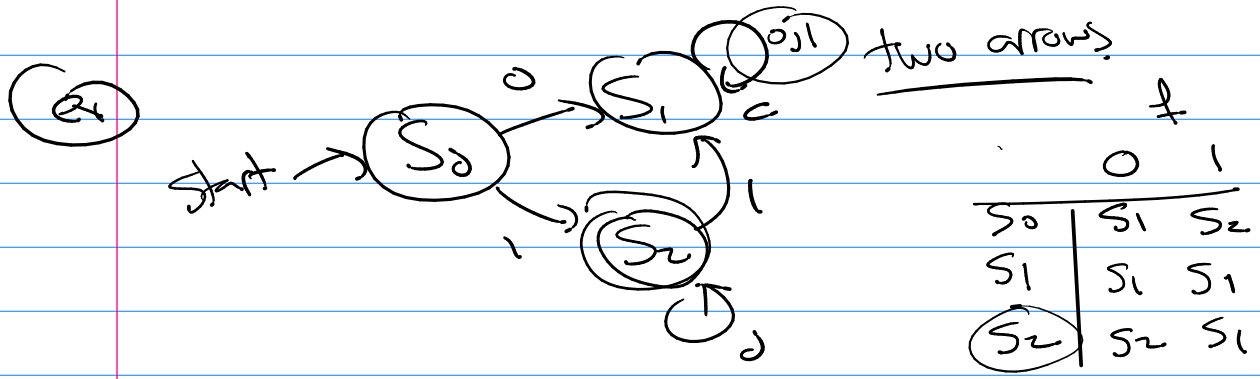
S: States

I: inputs

f: $S \times I \to S$

$s_0 \in S$ start state

$F \subseteq S$ is the set of final states



two arrows

f

	0	1
S_0	S_1	S_2
S_1	S_1	S_1
S_2	S_2	S_1