CprE 281 HW11

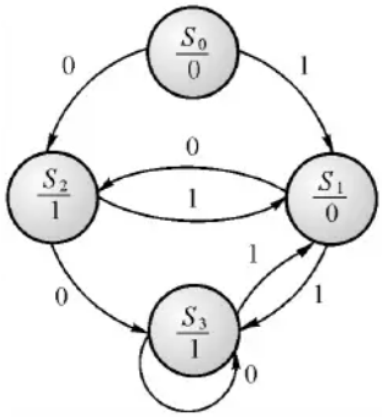
ELECTRICAL AND COMPUTER ENGINEERING
IOWA STATE UNIVERSITY

Moore & Mealy Machines

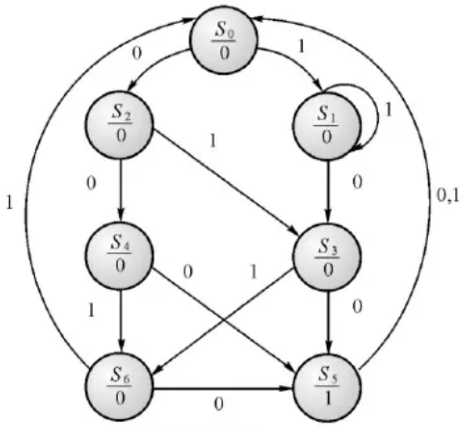
Finish by Nov. 13, 2023

P1 (20 points) The graphs for two FSMs are shown below. For each of them, draw the state table and the state-assigned table (don't derive expressions or draw circuits). Also, please indicate whether each is a Moore machine or a Mealy machine.

a)



b)



P2 (20 points) Consider the FSMs with the following state tables. For each, please provide the state graph and the state-assigned table. Also, indicate whether it is a Moore machine or a Mealy machine.

a)

Present State	Next State		Output
	W=0	W=1	
S0	S1	S2	0
S1	S2	S3	0
S2	S3	S2	1
S3	S1	S3	0

b)

Present State	Next State		Output z	
	w=0	w=1	w=0	w=1
A	A	B	0	1
B	C	B	1	0
C	B	A	0	0

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P3 (20 points) Consider an FSM with the following state transition table:

Present State	Next State		Output
	W=0	W=1	
A	B	C	0
B	A	D	1
C	D	A	0
D	B	C	1

a) (5 points) Perform the state assignment using binary encoding.
b) (15 points) Construct the corresponding circuit with DFF.

P4 (20 points) Design a Moore machine that detects a sequence "101" in the input stream. Whenever this pattern "101" is detected, the machine should produce an output of 1; otherwise, the output should be 0. Follow these steps and show your work for each step:

- Derive the state diagram
- Derive the state table
- Decide on a state encoding
- Encode the state table
- Derive the output logic and next-state logic
- Draw the circuit diagram
- Add a reset signal

P5 (20 points): Implement the FSM for this graph using the synchronous sequential approach. Follow the same steps as in P4. Show your work for each step.