WE6.1

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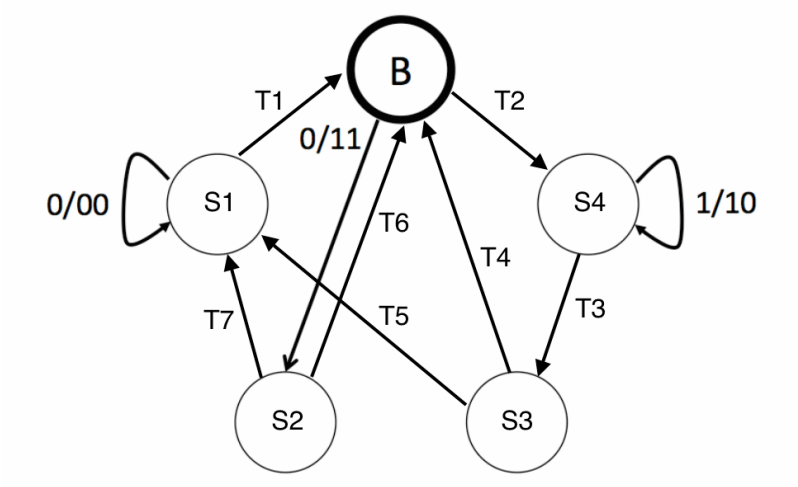
FSM

15/15 points (ungraded)

The truth table below represents a 5-state FSM with a 1-bit input (IN) and a 2-bit output (OUT). This FSM is a Mealy machine, i.e., its outputs are a function of both the current state and the current input. When the FSM is initialized its starting state is B.

S	IN	Next S	OUT
A	0	A	00
A	1	B	11
B	0	C	11
B	1	D	00
C	0	A	10
C	1	B	01
D	0	E	01
D	1	D	10
E	0	A	10
E	1	B	01



(A) Using the state transition table as a guide, match the numbered states (S1-S4) in the diagram with their corresponding labels (A-E) and label each transition (T1-T7) with IN/OUT (ex: 0/00) to represent which input causes the given transition and what the output is.

S1: A ✔ S2: C ✔ S3: E ✔ S4: D ✔

T1: 1/11 ✔ T2: 1/00 ✔ T3: 0/01 ✔ T4: 1/01 ✔

T5: 0/10 ✔ T6: 1/01 ✔ T7: 0/10 ✔

(B) Suppose the machine is initialized to its starting state B and then processes three input values 1,0,0. What sequence of outputs does it produce and what is its final state? (Put one space in between each pair of outputs in your answer, ex: xx xx xx.)

Sequence of outputs: 00 01 10 ✔

Final state: A ✔

(C) What sequence of inputs is guaranteed to leave the FSM in state E regardless of the state it's in before the sequence is processed? Give the shortest such sequence or write NONE if none exists. (Don't put spaces between inputs in your answer, ex: xxxx)

110 ✔

(D) Is there an equivalent FSM that has only 4 states? Either check NONE if no such FSM exists or check the names of the two states in the original 5-state FSM that can be merged to form an equivalent 4-state machi

Calculator

- [ ] NONE
- [ ] A
- [ ] B
- [x] C
- [ ] D
- [x] E

✔

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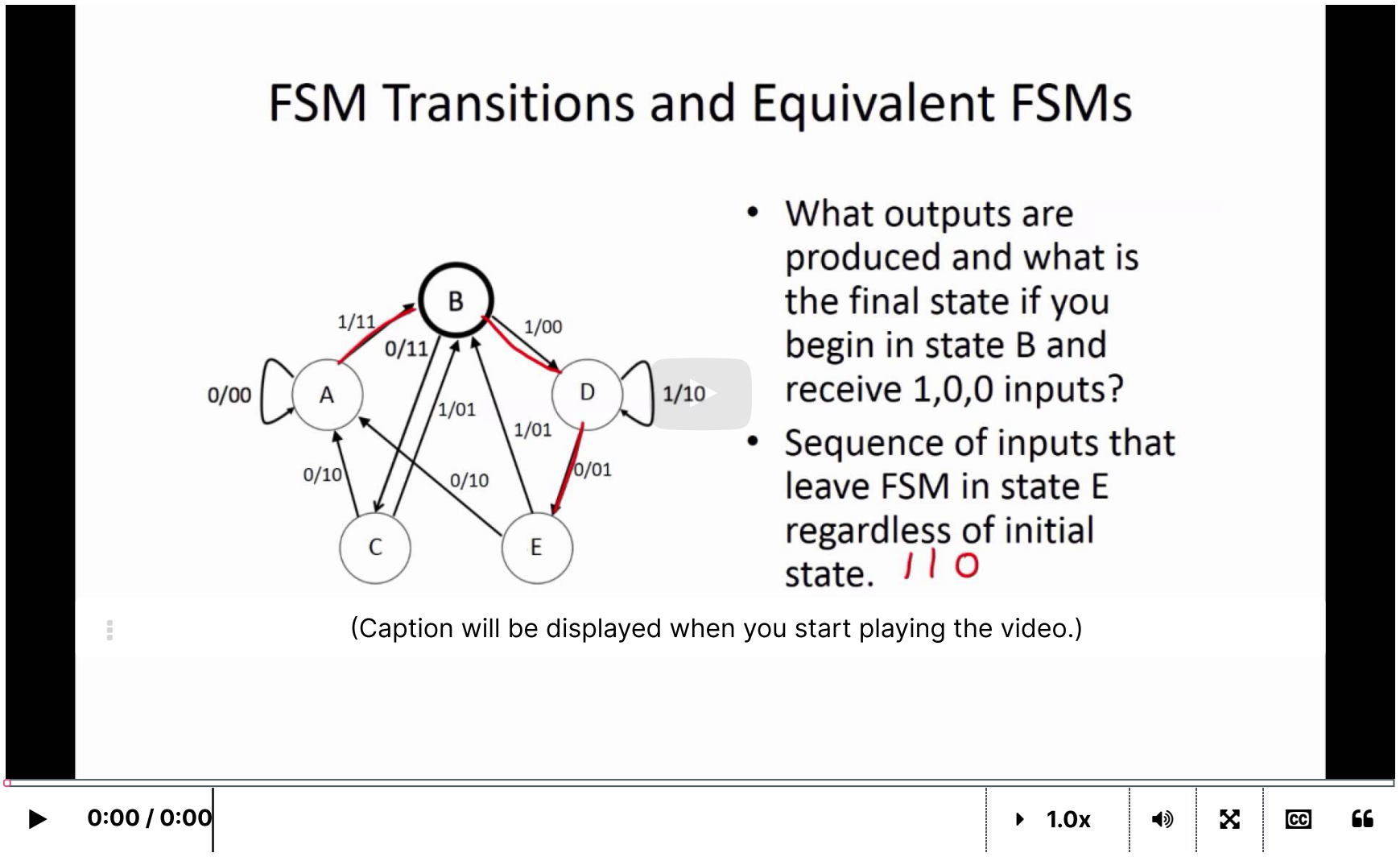
FSM States and Transitions



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