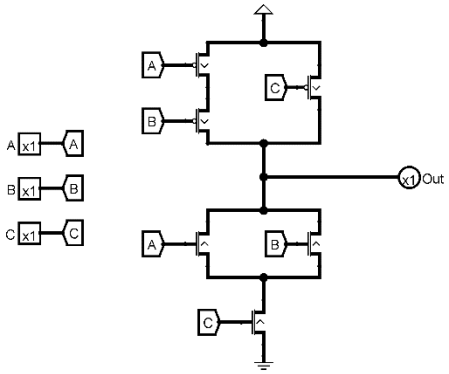
CS270 Transistors and State Machines Worksheet Name_____

1) Create the transistor diagram that implements the following Boolean formulas

A) Out = NOT((A OR B) AND C)

A	B	C	Out
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0



B) Out = (A AND B) OR C

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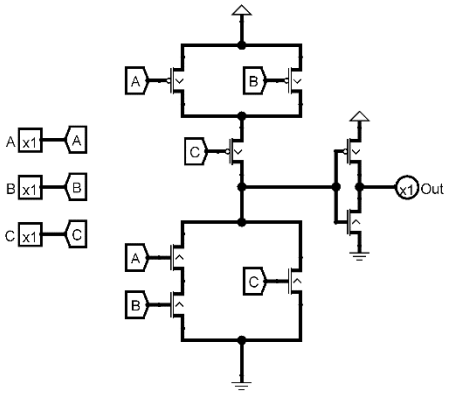
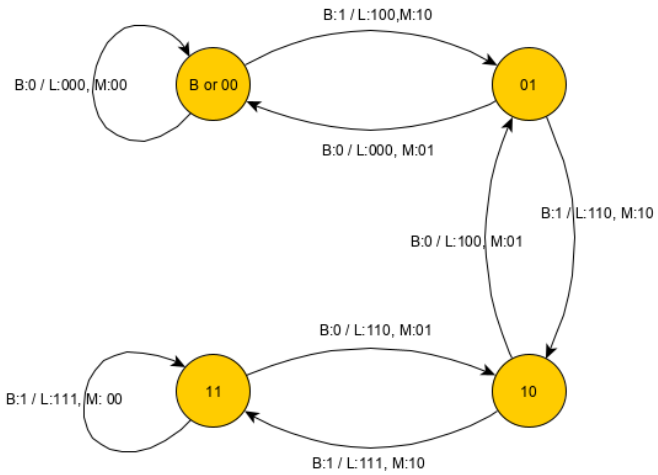
A	B	C	Out
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1



2) The following is the specification for a state machine based on an elevator controller

- 4 floors: B, 1, 2, 3
- Input:
  - Button: 1 up, 0 down
- Output:
  - Motor Controller: 10 up, 01 down, 00 no change
  - Status lights: Turn on one light per floor above basement, first floor 1 light, third floor 3 lights, etc.

A) Draw the state diagram for this state machine



B) Now fill in the state table/truth table for the state machine

Inputs			Outputs						
Button	S1	S0	S1'	S0'	Light1	Light2	Light3	Motor MSB	Motor LSB
0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	1
0	1	0	0	1	1	0	0	0	1
0	1	1	1	0	1	1	0	0	1
1	0	0	0	1	1	0	0	1	0
1	0	1	1	0	1	1	0	1	0
1	1	0	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	0	0

C) Now draw the circuit diagram