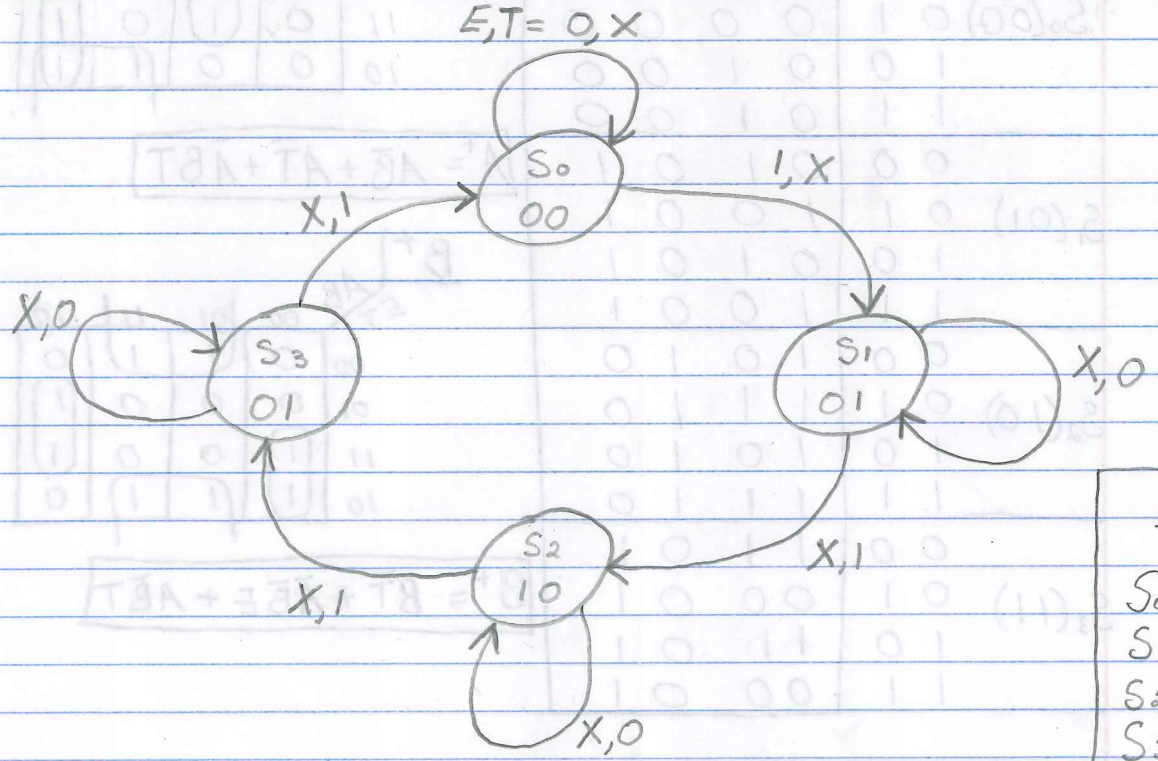
Lab Final

State Diagram:

Two inputs:
- E = enable bit
- T = Terminal Counter bit that comes from LS163 chip. Chip outputs a 1 when 4s have passed

Two outputs:
- M = outputs 1 when moving & 0 when not (MSB)
- D = outputs 1 when door open & 0 when closed (LSB)



Assignments: A B
$S_0 = 00$
$S_1 = 01$
$S_2 = 10$
$S_3 = 11$

S_0 : Idle state, not moving & door closed
S_1 : Enable input received, door open for 4 seconds before moving
S_2 : Elevator moving for 4s, door closed
S_3 : Elevator stops moving & opens door for 4s then goes idle

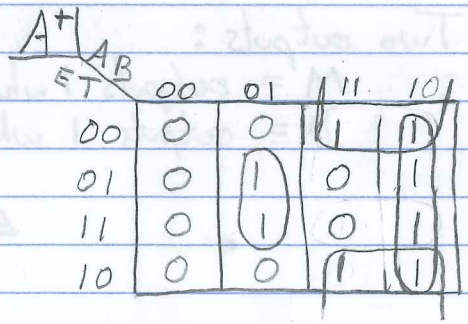
* Floor changes through a combinational circuit that receives the outputs for state S_2 of M=1 & D=0 together with T=1 input bit. Logic will output a 1 to a TFF on this condition

State Table:

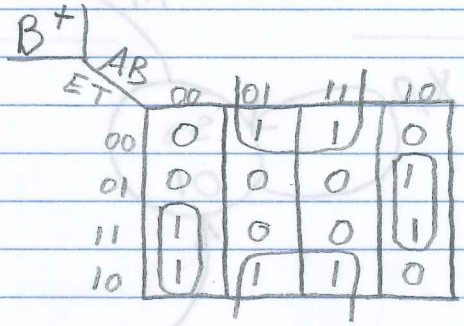
Present State	Next State				Output
	E,T=00	E,T=01	E,T=11	E,T=10	M, D
S_0	S_0	S_0	S_1	S_1	0 0
S_1	S_1	S_2	S_2	S_1	0 1
S_2	S_2	S_3	S_3	S_2	1 0
S_3	S_3	S_0	S_0	S_3	0 1

Truth Table:

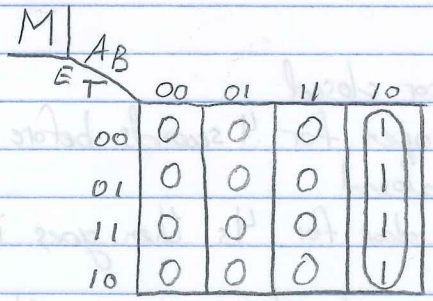
A B	E T	A^+	B^+	M	D
S_0(00)	0 0	0	0	0	0
	0 1	0	0	0	0
	1 0	0	1	0	0
	1 1	0	1	0	0
S_1(01)	0 0	0	1	0	1
	0 1	1	0	0	1
	1 0	0	1	0	1
	1 1	1	0	0	1
S_2(10)	0 0	1	0	1	0
	0 1	1	1	1	0
	1 0	1	0	1	0
	1 1	1	1	1	0
S_3(11)	0 0	1	1	0	1
	0 1	0	0	0	1
	1 0	1	1	0	1
	1 1	0	0	0	1



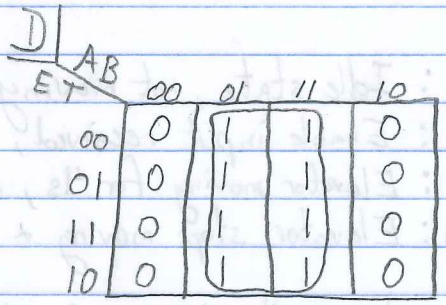
$$A^+ = A\bar{B} + A\bar{T} + \bar{A}BT$$



$$B^+ = B\bar{T} + \bar{A}\bar{B}E + A\bar{B}\bar{T}$$



$$M = A\bar{B}$$



$$D = B$$