Assignment 2

Due on Mon Oct 26th at 10:00 pm

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Section: VAR

Design a counter Using T ff's. This counter should count down from 7 to 0 to 7. The circuit counts downward with sequence **111,110,101,100,011,010,001,000** and then the count repeats.

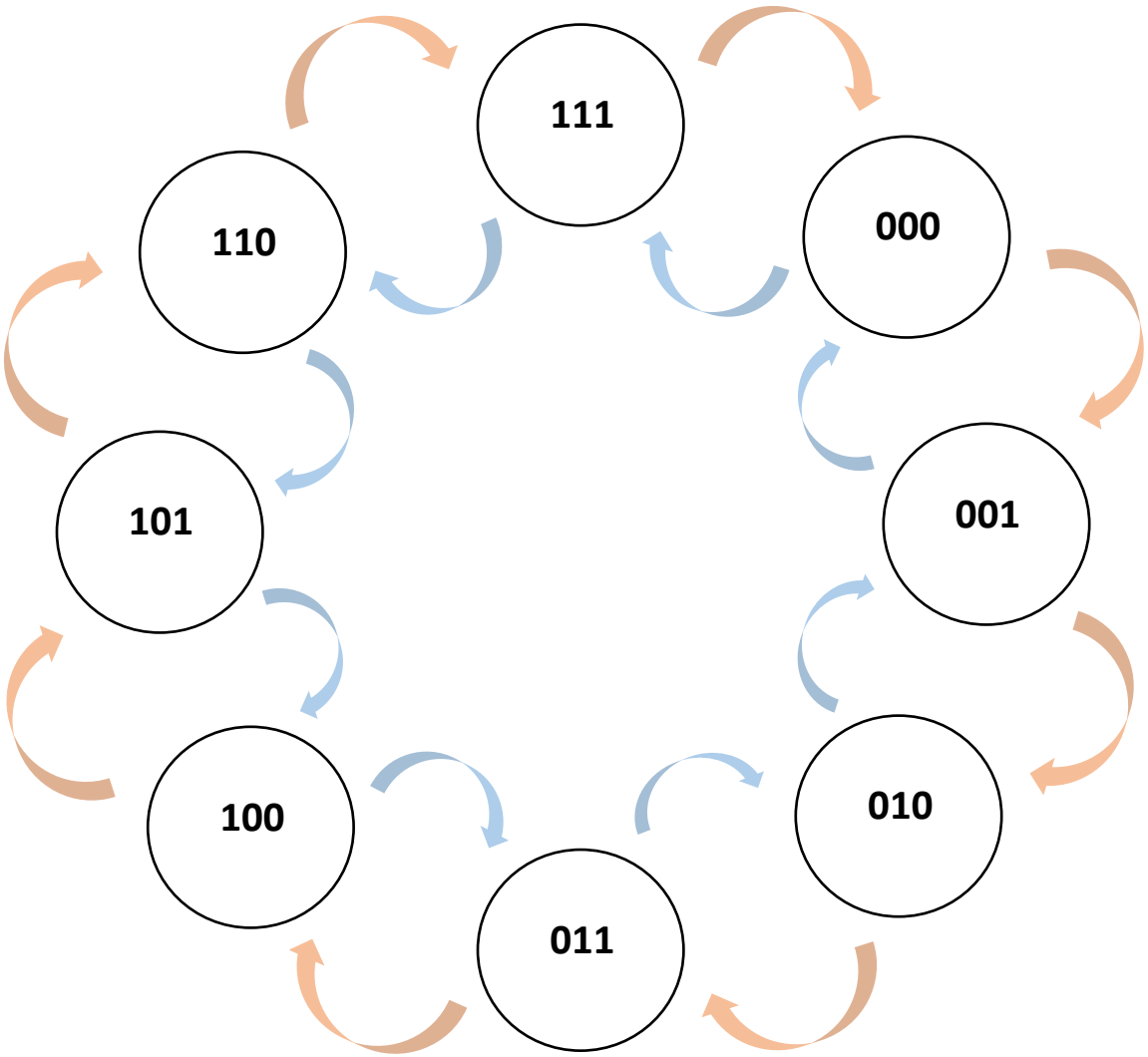
You will need to:

- Derive the state diagram and state table

From 7 to 0

From 0 to 7

State diagram



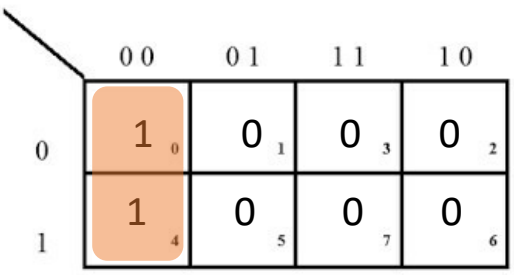
State table

Present state A2 ,A1 ,A0	Next state A2+ A1+ A0+	Flip- Flops input TA2, TA1, TA0
0 0 0	1 1 1	1 1 1
0 0 1	0 0 0	0 0 1
0 1 0	0 0 1	0 1 1
0 1 1	0 1 0	0 0 1
1 0 0	0 1 1	1 1 1
1 0 1	1 0 0	0 0 1
1 1 0	1 0 1	0 1 1
1 1 1	1 1 0	0 0 1

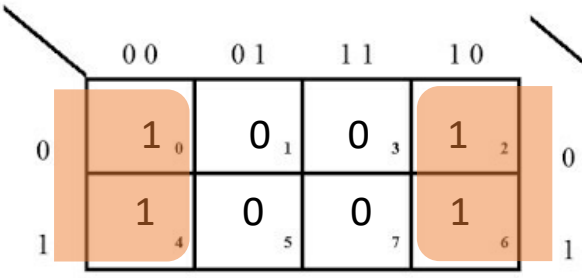
Present state A2 ,A1 ,A0	Next state A2+ A1+ A0+	Flip- Flops input TA2, TA1, TA0
0 0 0	0 0 1	0 0 1
0 0 1	0 1 0	0 1 1
0 1 0	0 1 1	0 0 1
0 1 1	1 0 0	1 1 1
1 0 0	1 0 1	0 0 1
1 0 1	1 1 0	0 1 1
1 1 0	1 1 1	0 0 1
1 1 1	0 0 0	1 1 1

- Draw the k-maps and derive the logical expressions

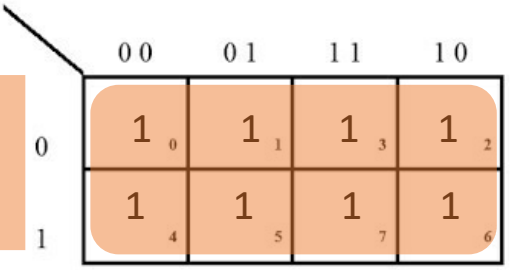
K map



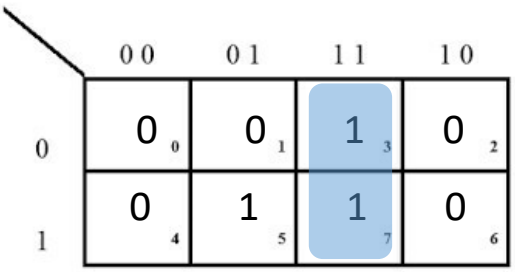
TA2= A1’ . A0’



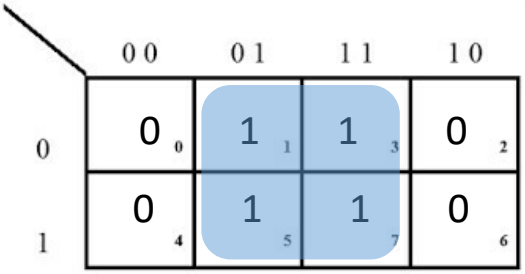
TA1= A0’



TA0= 1



TA2= A1 . A0



TA1= A0

TA0= 1

- Design and implement the circuit using Logisim.

Show your work below, include a picture of the final design from the simulator and submit the Logisim file as well.