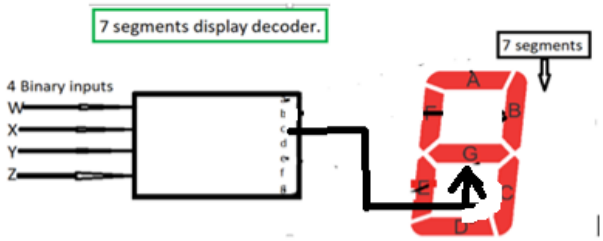
MAC283 Midterm

1. Design and implement a 7 segments decoder for the segment “g(12)” Draw the schematics using a circuit simulation program.



Specifications Table for the decoder

	IN	IN	IN	IN		OUT	OUT	OUT	OUT	OUT	OUT	OUT
Count	W	X	Y	Z		a	b	c	d	e	f	g
0	0	0	0	0		1	1	1	1	1	1	0
1	0	0	0	1		0	1	1	0	0	0	0
2	0	0	1	0		1	1	0	1	1	0	1
3	0	0	1	1		1	1	1	1	0	0	1
4	0	1	0	0		0	1	1	0	0	1	1
5	0	1	0	1		1	0	1	1	0	1	1
6	0	1	1	0		1	0	1	1	1	1	1
7	0	1	1	1		1	1	1	0	0	0	0
8	1	0	0	0		1	1	1	1	1	1	1
9	1	0	0	1		1	1	1	1	0	1	1
10(A)	1	0	1	0		1	1	1	0	1	1	1
11(B)	1	0	1	1		0	0	1	1	1	1	1
12=C	1	1	0	0		1	0	0	1	1	1	0
13=D	1	1	0	1		0	1	1	1	1	0	1
14=E	1	1	1	0		1	0	0	1	1	1	1
15=F	1	1	1	1		1	0	0	0	1	1	1

2. Design and implement using T-FF a binary loop counter that counts:
   0→2→1→6 and back to 0 in a loop.
   Use Karnaugh maps to obtain the circuit and thereafter, a circuit simulation software to implement the counter circuit.
3. Simplify the following Karnaugh map and implement its simplified circuit using a circuit simulation program.

AB CD	00	01	11	10
00	1		1	1
01		1		1
11		1		1
10	1		1	1

Please show all the work leading to your answer.
Submit your work to: prof@dpeled.com before leaving make sure I receive it.

Good Luck!