Digital Logic Review II

Announcements

- No Class next Monday
- Homework #1 due in 1 week
- Check your lab schedule in the Syllabus to see when lab reports and prelabs are due!

Group Homework

- Review homework policies
  - Posted on MyCourses
- Time for teams find each other and exchange contact info

K-map Review

msb A	B	C	lsb D	box
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	8
1	0	0	1	9
1	0	1	0	10
1	0	1	1	11
1	1	0	0	12
1	1	0	1	13
1	1	1	0	14
1	1	1	1	15

msb

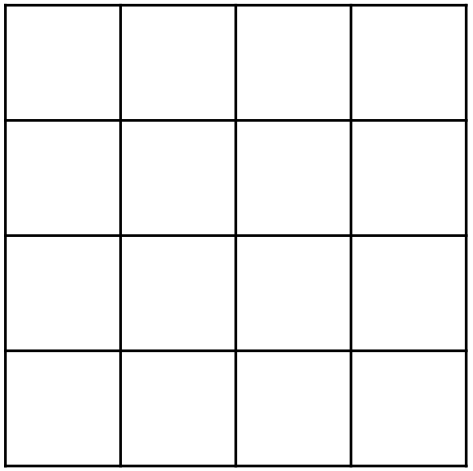
lsb

lsb \ msb	$\bar{A}\ \bar{B}$	$\bar{A}\ B$	$A\ B$	$A\ \bar{B}$
$\bar{C}\ \bar{D}$	0	4	12	8
$\bar{C}\ D$	1	5	13	9
$C\ D$	3	7	15	11
$C\ \bar{D}$	2	6	14	10

K-map Review

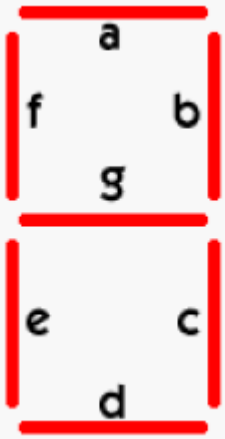
1. Set up the k-map for the following function and generate the simplified equation from the k-map

A	B	C	D	F
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1



Seven Segment Display Review

- Seven Segment displays
  - Called HEX0 and HEX1 on DE0 boards



HEX00 = a

HEX01 = b

:

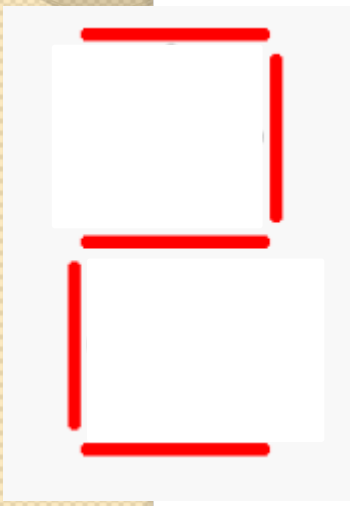
:

HEX06 = g

  - 0 is ON : 1 is OFF
    - Called common _____?

Seven Segment Display Review

- To display 2 drive the outputs as follows:



	a	b	c	d	e	f	g
1 or 0							

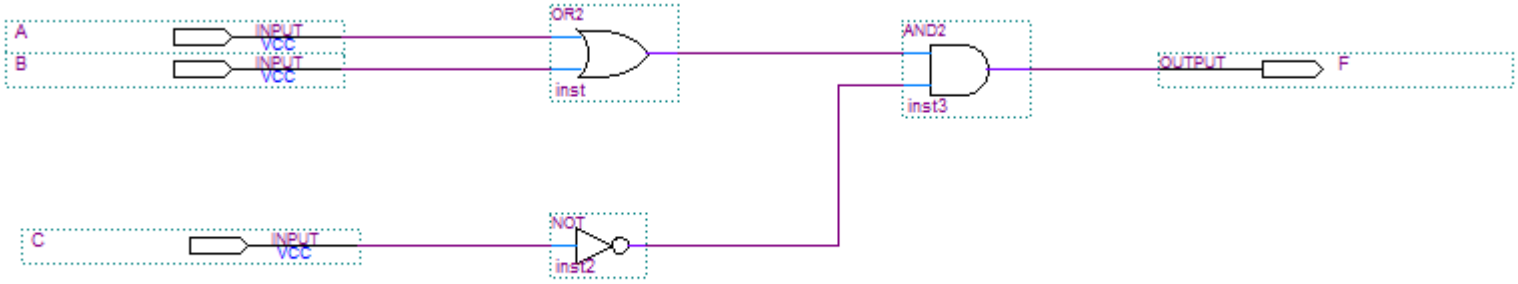
- A digital circuit that drives a seven segment display has seven outputs
  - Ergo: seven k-maps are necessary when designing

Seven Segment Display Pinout

HEX00	**PIN_U21**	**Seven Segment Digit 0[0]**
HEX01	**PIN_V21**	**Seven Segment Digit 0[1]**
HEX02	**PIN_W22**	**Seven Segment Digit 0[2]**
HEX03	**PIN_W21**	**Seven Segment Digit 0[3]**
HEX04	**PIN_Y22**	**Seven Segment Digit 0[4]**
HEX05	**PIN_Y21**	**Seven Segment Digit 0[5]**
HEX06	**PIN_AA22**	**Seven Segment Digit 0[6]**

Waveform Simulation

- Given the following circuit

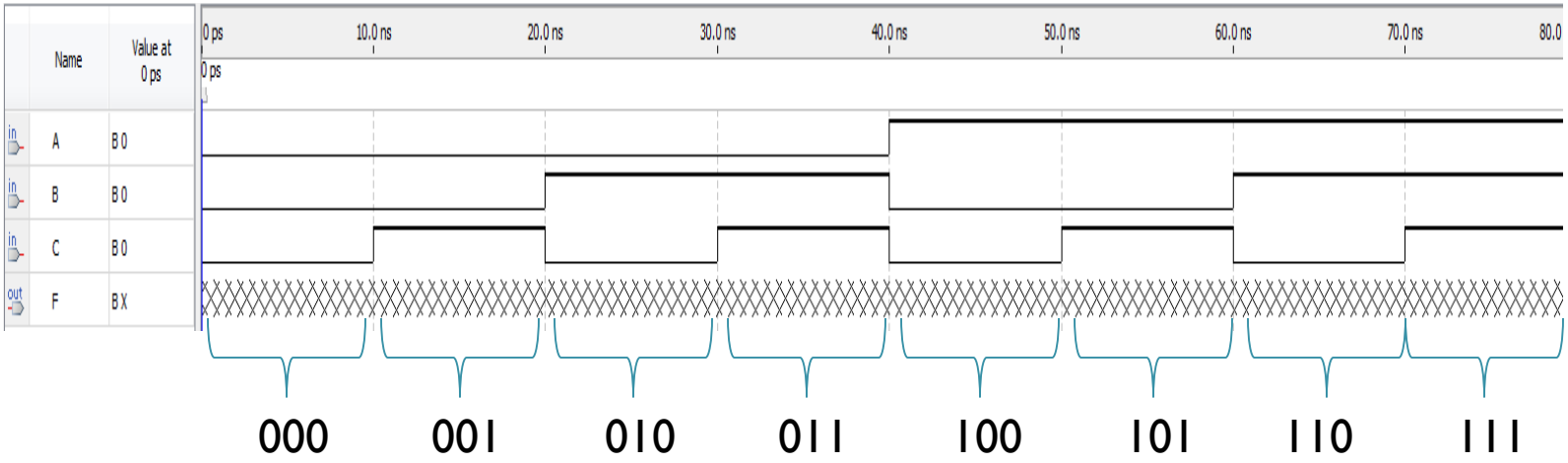


- Test every combination of A, B & C

A	B	C	F
0	0	0	
0	0	I	
0	I	0	
0	I	I	
I	0	0	
I	0	I	
I	I	0	
I	I	I	

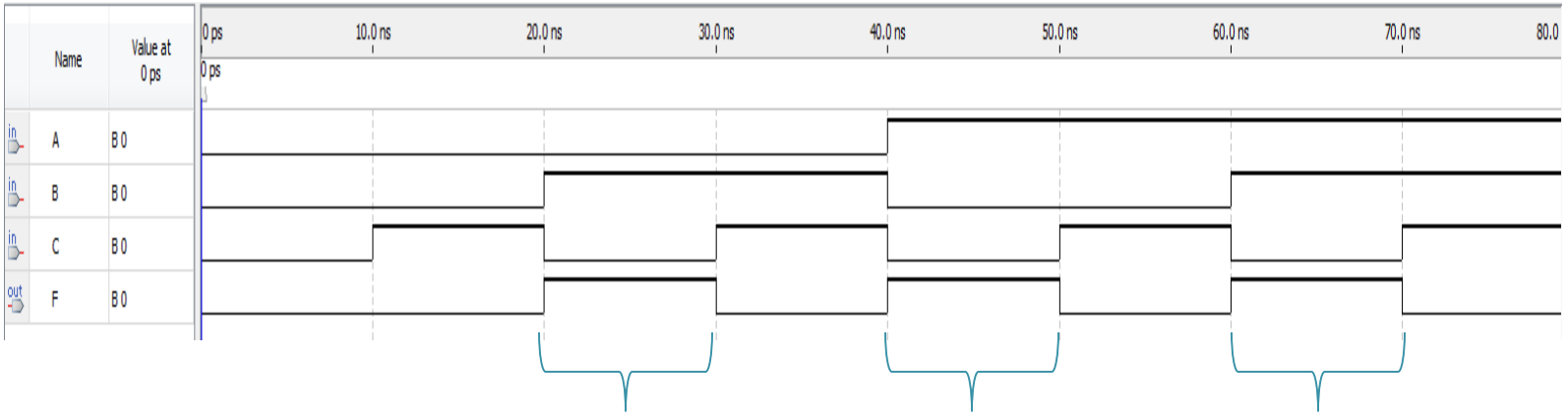
Waveform Simulation

- Use a waveform to test every combination



Waveform Simulation

- Run simulation tool



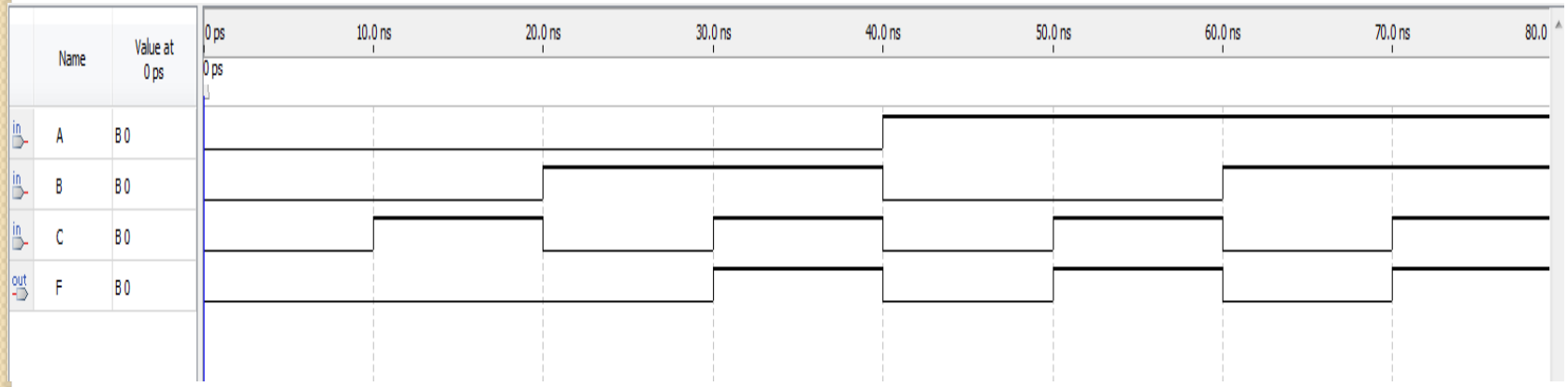
A=0
B=1
C=0
F=1

A=1
B=0
C=0
F=1

A=1
B=1
C=0
F=1

Waveform Simulation

- Make sure the results are what you expect



- What does the waveform for F tell you?