Class:	CPE 100L - 1002	Semester:	SPRING 2020

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Instructor's comments:

1. Introduction / Theory of Operation

Lab 3 is an introduction to digital logic gates and simple Boolean implementation. This allows us to understand the function of digital logic gates and implement simple combination circuit and gain experience of design flow.

2. Prelab report

My prelab report will be included as another attachment.

3. Results of the Experiments

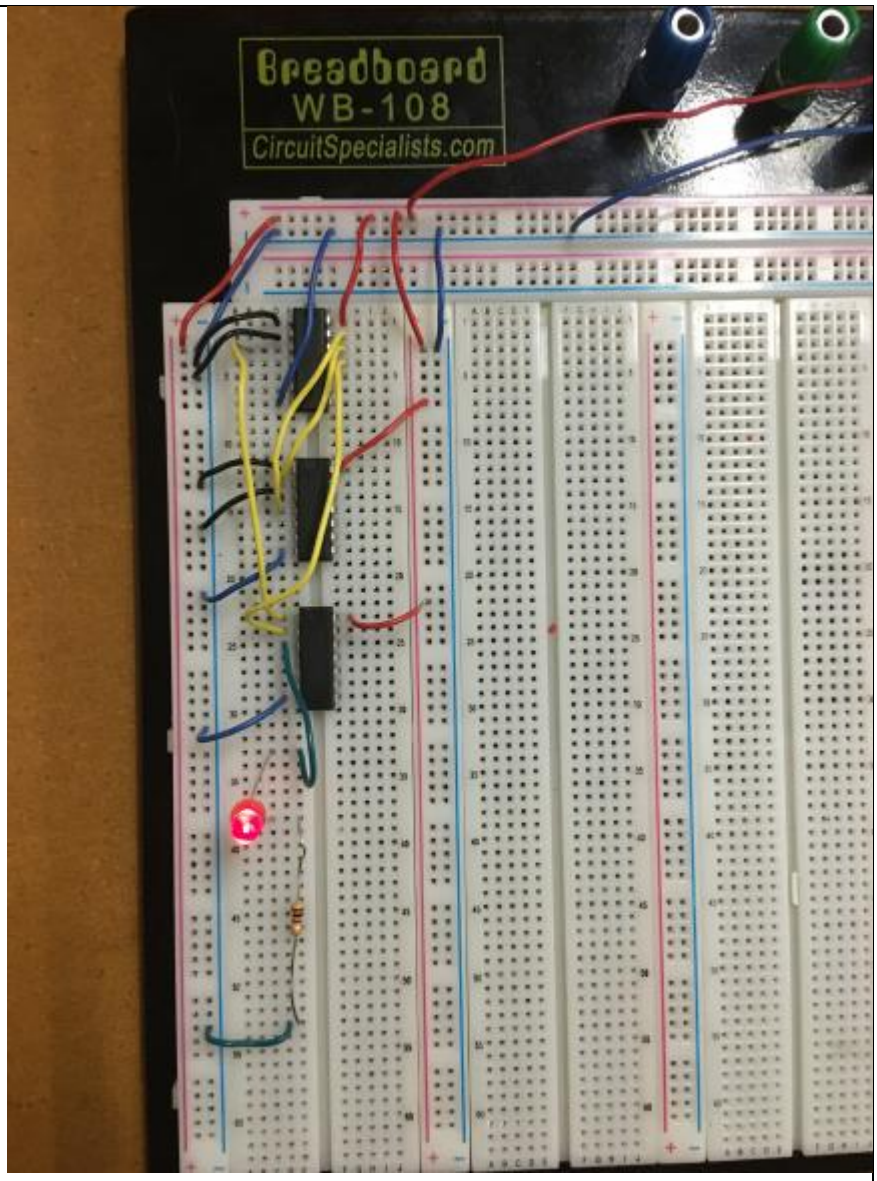
Experiment 1

a) F = ab + a'b'

i. Truth table

A	B	AB	A'B'	F
0	0	0	1	1
0	1	0	0	0
1	0	0	0	0
1	1	1	0	1

ii.

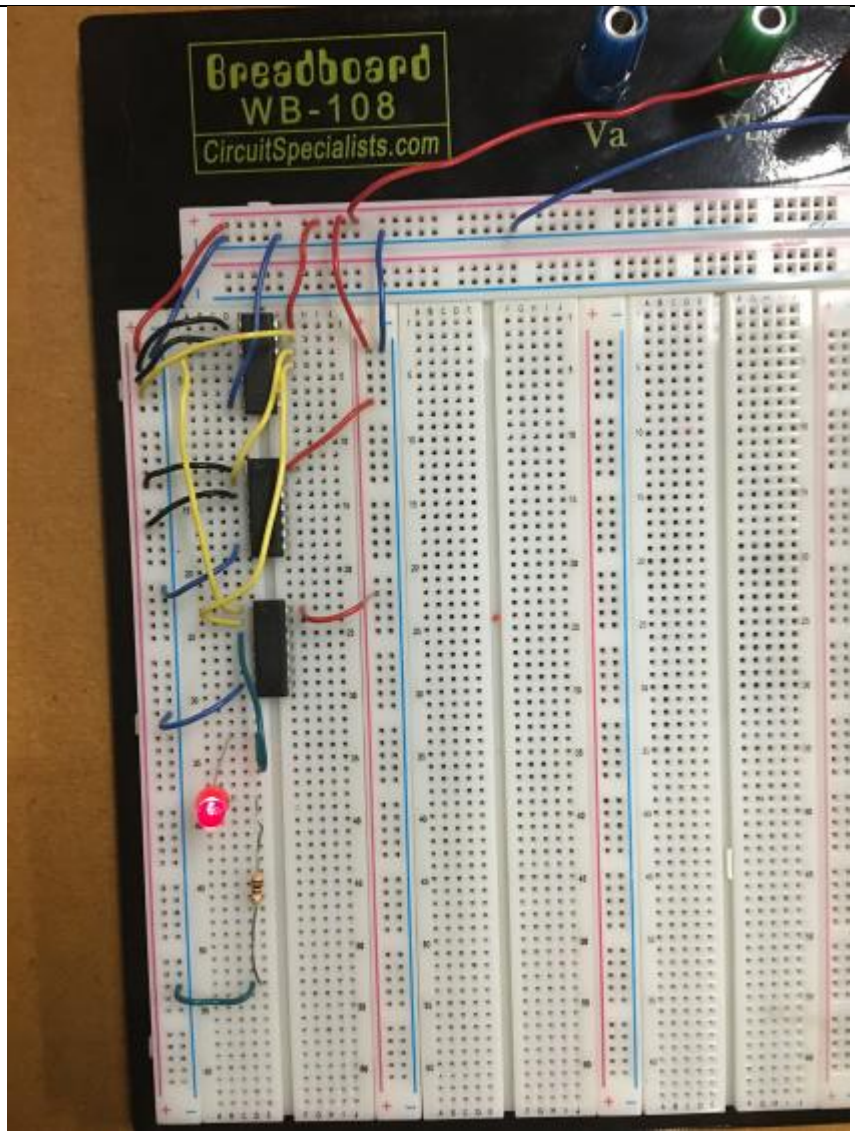


b) F = F = ab + a'b

i. Truth table

A	B	AB	A'B	F
0	0	0	0	0
0	1	0	1	1
1	0	0	0	0
1	1	1	0	1

ii.

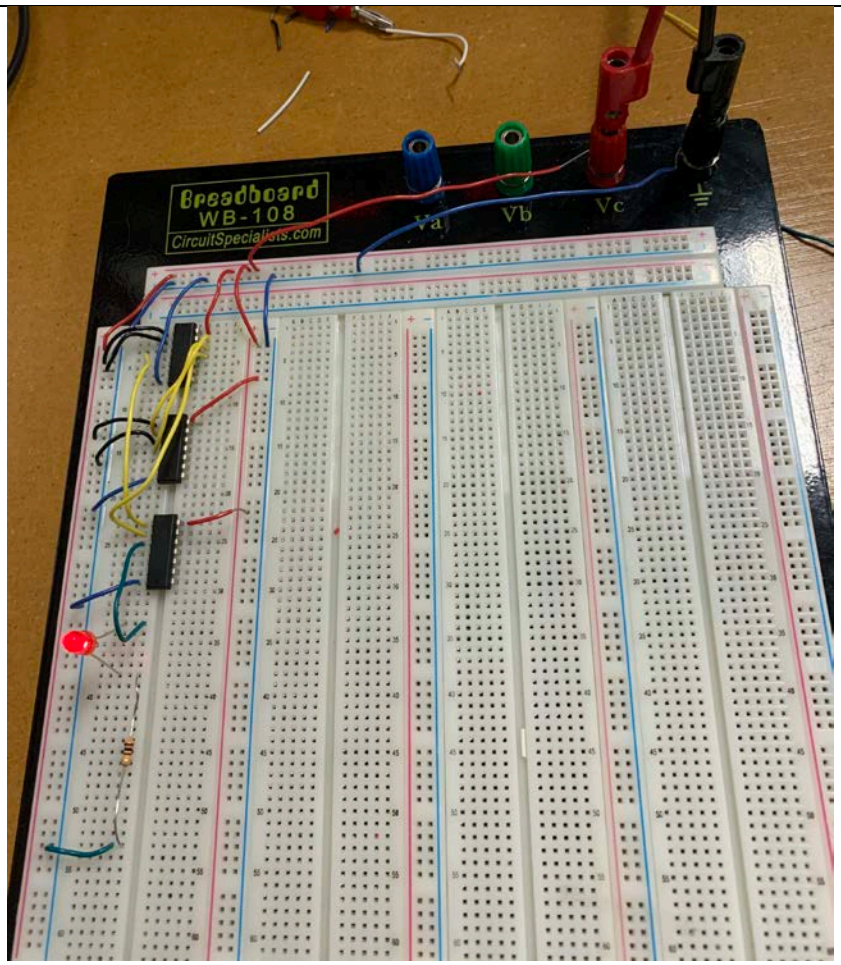


c) F = (a + b) (a’ + b’)

i. Truth table

A	B	A+B	A’+B’	F
0	0	0	1	0
0	1	1	1	1
1	0	1	1	1
1	1	1	0	0

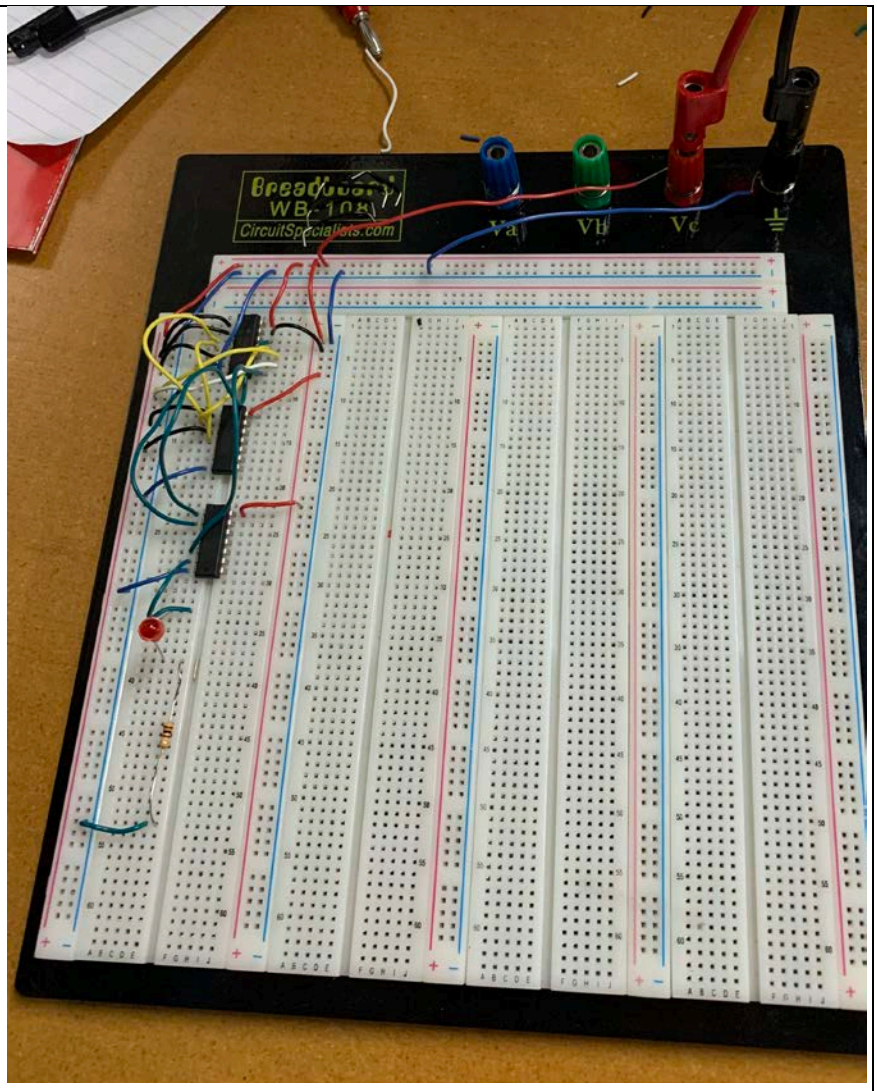
ii.



d) F = abc + a'b'c + a'cb

i. Truth table

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

	ii. 

4. Answer the questions

1) The 74xx series or 7400 integrated circuits are the most popular logic families. The chips in this series include a variety of discrete logic chips such as AND gates or OR gates.
2) The sumbol of IC chips for AND gate is 7408, OR gate is 7432, XOR gate is 7486, NOT gate is 7404.
3) AND gates and OR gates and XOR gates are made with more than three inputs, but this is less common than the simple two-input variety. NOT gates can also take more inputs but it usually takes one input and output at a time. The limitations for the logic gates is that the output of all circuits are delayed from input.

5. Conclusions

This lab was a bit more difficult than the other labs because we had to implement functions on the breadboard. I realized that it might be difficult to get a circuit working properly if you are

disorganized. The first three functions were not very difficult to implement, but the last circuit was quite difficult due to our lack of communication and organization. In order to fix this issue, I went home and experimented on Tinker Cad, which made me realize that organization is definitely the key to success during the experiments.