Prelab for Lab #5: Stepper Motor in C
Week of 25 February 2019

Pre-lab

Part A – Textbook Readings / Videos

1. Textbook `Chapter 16` to review stepper motors

2. For background on how stepper motors work, you can watch the following videos on youtube that the textbook recommends, *How the Stepper motors are made and how they operate* by pcbhaven

    (a) `http://www.youtube.com/watch?v=MHdz3c6KLrg`

    (b) `http://www.youtube.com/watch?v=t-3VnLadIbc`

Part B – Prelab assignment

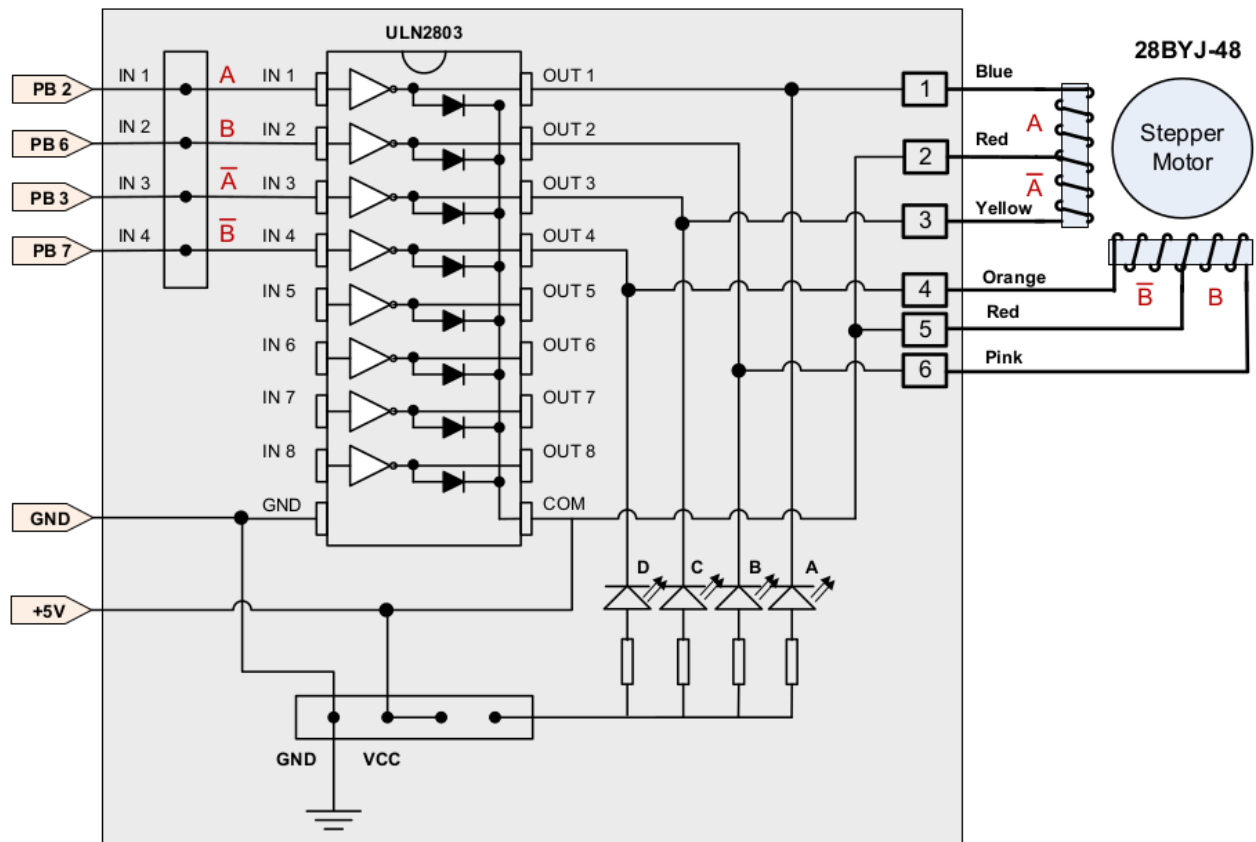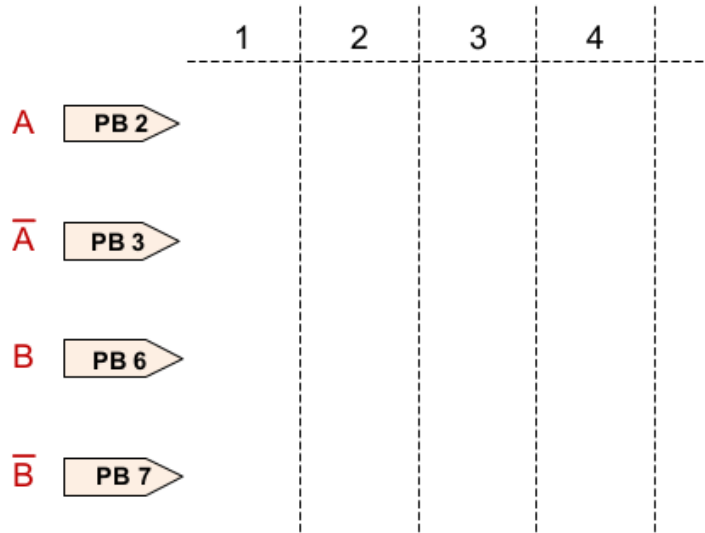Interfacing the stepper motor requires four pins. We will be using GPIO PB2, PB3, PB6, and PB7.

Figure 1: Diagram of the motor driver board.

1. Calculate the pattern for Full-stepping

Refer to Figure 16-9 in the book and sketch out below what the waveform should be on the pins for a full-stepping sequence.

For this lab we will use the BSRR (bit set/reset) register for enabling the pins in the proper sequence. Fill in the values you will write to this register to create the pattern you drew above (you only need to fill in the 1s).
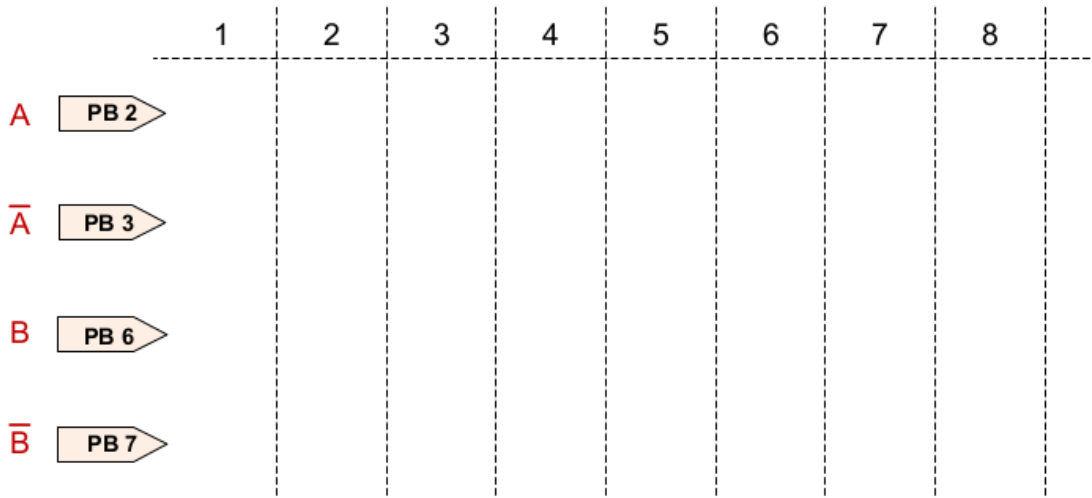
BSRR	Reset																Set															
Register	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Step 0																																
Step 1																																
Step 2																																
Step 3																																

Put the hex values based on the above steps here for easy reference:

0.

1.

2.

3.

2. Calculate the pattern for Half-stepping

Refer to Figure 16-11 in the book and sketch out below what the waveform should be on the pins for a half-stepping sequence.

For this lab we will use the BSRR (bit set/reset) register for enabling the pins in the proper sequence. Fill in the values you will write to this register to create the pattern you drew above.

BSRR			Reset																	Set													
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Step 0																																
Step 1																																
Step 2																																
Step 3																																
Step 4																																
Step 5																																
Step 6																																
Step 7																																

Put the hex values based on the above steps here for easy reference:

0.

1.

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3.

4.

5.

6.

7.