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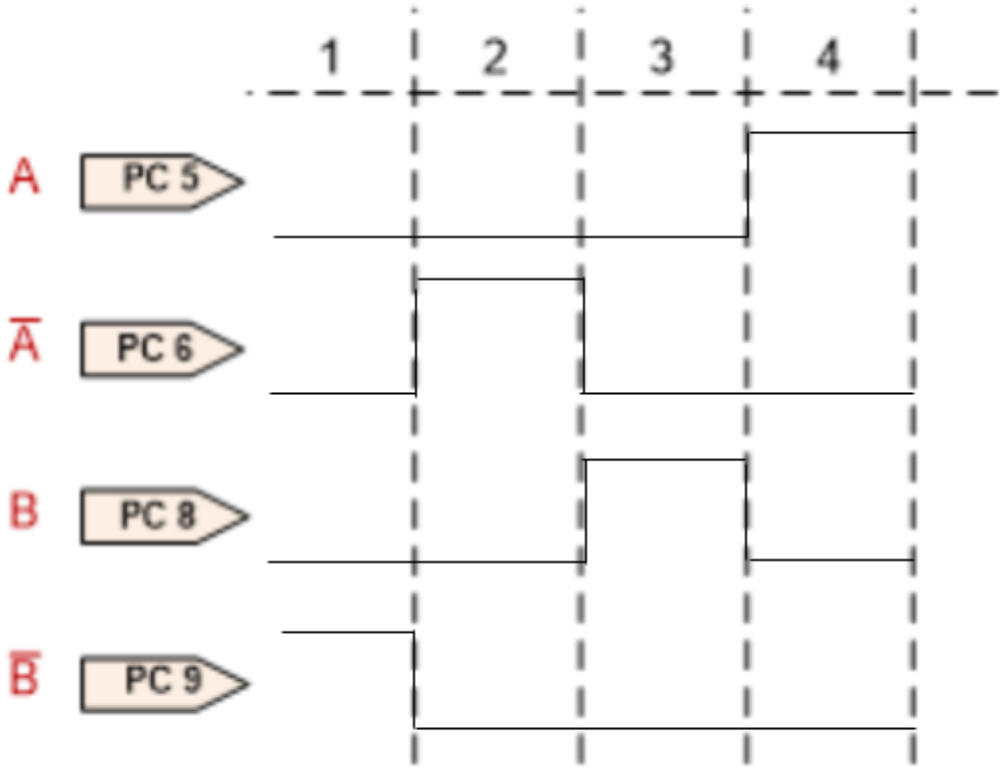
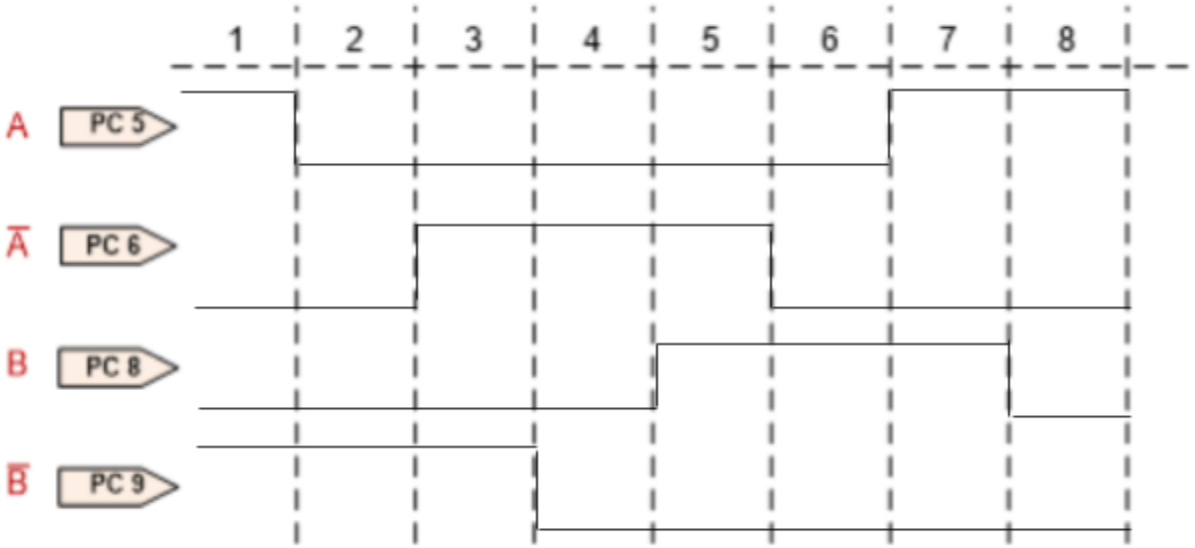
ECE 153B W23

Lab6 Questions





a. Rotation speed of the stepper motor depends on the delay between consecutive steps. Decreasing the delay increases rotation speed and vice versa.
b. Reverse the rotation direction by going backwards in the stepping sequence.

3. Delay equivalent to looping from 0 to ~300 by incrementing
4. Delay equivalent to looping from 0 to ~150 by incrementing
5. Highest update frequency is higher for half-stepping than full-stepping because the angle to turn the rotor is smaller in half-stepping, so it requires less time per step which equates to higher update frequency.

Servo Motor Position	Pulse Width	Value of **TIM5->CCR1**
−90°	1 ms	pulse width = 1ms Duty cycle = CRR/(ARR + 1) with a period = 0.02s duty cycle = (1ms)/(.02) = 0.05 = 5% thus CCR = .05 * 2000 = 100 = 0x64
0°	1.5 ms	pulse width = 1.5ms Duty cycle = CRR/(ARR + 1) with a period = 0.02s duty cycle = (1.5ms)/(.02) = 0.075 = 7.5% thus CCR = .075 * 2000 = 150 = 0x96
90°	2 ms	pulse width = 2ms Duty cycle = CRR/(ARR + 1) with a period = 0.02s duty cycle = (2ms)/(.02) = 0.1 = 10% thus CCR = 0.1 * 2000 = 200 = 0xC8