Lab 1

Pre-Lab

Question 2.1) All four of the props push air down - they need to for the drone to fly. They spin in opposite directions so the net torque on the drone is zero unless you want to rotate. If they all rotated in the same direction, the drone would spin.

Question 2.2) A PWM signal is displayed as a periodic square wave that is generated by the Beagle Bone Blue board. Each cycle of the wave can be controlled to express a percentage value using a digital signal. This, in turn, controls the speed of the motors.

Question 2.3) I know it's a little bit counter-intuitive, but you actually need to increase the throttle on the counter-clockwise motors (A and C) to get the drone to rotate clockwise. For the motors to rotate counter-clockwise, the body exerts a counter-clockwise torque on the propellers. The propellers thus impart an equal and opposite clockwise torque on the body, causing it to rotate clockwise.  
  
Additionally, you need to decrease one pair of motors by the same amount you increase the other pair to keep the total thrust the same. Otherwise, the QC will change in altitude.

Question 2.4)

- 85% duty cycle

- 1.7 ms