Trajectory Planning

1. Write a Matlab function to create a quintic polynomial that blends initial position, velocity and acceleration at a start time with a final position, velocity and acceleration at an end time. Test your function and turn in a plot of one trajectory (position, velocity, acceleration) when

   - $t_o = 5$ sec, $q(t_o) = 0.5$, $\frac{dq(t_o)}{dt} = \frac{d^2q(t_o)}{dt^2} = 0$,
   - $t_f = 12$ sec, $q(t_f) = -0.7$, $\frac{dq(t_f)}{dt} = \frac{d^2q(t_f)}{dt^2} = 0$.

2. Write a Matlab function to create a Linear Segment Parabolic Blend (LSPB) that blends an initial position at a start time with a final position at an end time. Test your function and turn in a plot of one trajectory (position, velocity, acceleration) when

   - $t_o = 5$ sec, $q(t_o) = 0.5$,
   - $t_f = 12$ sec, $q(t_f) = -0.7$,
   - constant velocity chosen as $V = 1.2\frac{q_f - q_o}{t_f}$.

Keep in mind you will use these functions in your next project (inverse kinematics with trajectory planning) where initial and final configurations will be vectors. Give a little thought to their structure and input/output.