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**Linear Quadratic Regulator:**

To place poles with LQR we went back to our simulation and used the lqr() function. We tried multiple values for Q and R and eventually settled on Q = [0.8 0;0 0.1] and R = [10], with this Q and R we got gain values of 0.1482 and 0.1049 with eigenvalues of -4.0785 and -14.2570. These gain values are less than our slightly different from our previously obtained poles indicating we should be close.

These values resulted in poor performance, making the actual hover copter overdamped. After consulting with the other team and using a Q = [10 0; 0 1] and R = [1]. We got gain values of 2.9725 and 1.0139. And eigenvalues of -3.1725 and -168.8093.

**Results:**

The Hover Copter Functioned much better with the second values with no “wobbliness”.