RBE 500 – Final Assignment – Part 2

This assignment is about controlling the robot joints.

1) Implement a position controller for your robot joints. Here we want you to write PD Controllers yourselves. DO NOT use the readily available ROS packages. Your package will read the joint values from the Gazebo simulator, receive a reference value for the joints through a service, and publish joint efforts (continuously with high sampling rates) to make the joints move to these locations.
2) You will need to tune the PD gains (you do not need to calculate them in this assignment). Do your best to have fast convergence with minimal overshoot. (While doing so, you may want to first fix the all the joints except the last joint by changing the joint type field of the corresponding joints to “fixed”. Tune it for that joint and move to the next ones. You do not need to do the tuning this way, it is just a suggestion.)
3) For three different sets of joint position references, record the reference positions and current positions of the joints in a text file for a period of time (e.g. for 10 seconds with sampling time of 0.01 secs) and plot them via Matlab (or any other visualization software).

Please write a report about your implementation. The report does not have to be long, but it should explain all the steps of the implementation. Copy-pasting the code and the results is not enough. Submit your code together with your report.