

## Homework – File Handling and Wall-Following PID

1. Write an NXC program using best practices. The program iterates integers from -10 to +10 incrementally by 1. Compute the cube and save to a file named "cubic.csv". Export the data file and plot the curve in Excel. Show your NXC code (10-points) and Excel plot (10-points)
2. Write an NXC program called wfPidFile1\_0a.nxc using best practices. The program will save portside-to-wall distance data into a file named "dona.csv". Recall the lab on Wall Following PID; Concept 2 had one capture wall distance data for 4 different proportional gains. Show your NXC code (10-points). You only need to show the code for a single gain case. Generate your own Excel graphs for:

kP	kI	kD	YouTube URL	Excel Plot
0	0	0		
1.5	0	0		
5	0	0		
15	0	0		

For reference, see the plots in Concept 2 of the lab. Make sure to title the graph with the correctly (i.e. gain values), labels both the horizontal and vertical axes, and add minor gridlines (10-points for each graph; 4 plots total = 40 points). Observe your 4 plots. How does the rise time change and gain kP increases (5-points)? How does the steady-state error change as kP increases (5-points)?