



EMBEDDED SYSTEMS

Assignment 3

I2C PROTOCOL



- Wire the LM303DLHC Triple-axis Accelerometer +Magnetometer board to your MBED LCP1768 on the provided breadboard.
- Write programs to test sensor connectivity for accelerometer and magnetometer functions.
 - Demonstrate a test program (by video) that shows the heading of the sensor board (as reported by the magnetometer/compass) written to the console with 1 Hz updates as you rotate your system.
 - Commit the program to your team repository under the branch assignment3-compass.
 - Demonstrate a test program (by video) that shows the accelerometer readings at 10Hz while tapping your assembled system board.
 - Commit the program to your team repository under the branch assignment3-accel.
 - *Libraries exist for other platforms. You may use that code as reference.*

SENSOR SYSTEM



- Write a program that demonstrates connectivity to both sensor functions concurrently.
 - The system should report both direction and acceleration to the console at fixed frequencies.
 - Compass and accelerometer sampling should not occur at the same frequency.
 - On your assignment wiki page explain what frequencies you chose and why.
 - Commit the program to your team repository under the branch assignment3-sensor.
 - Demonstrate with a short video.
 - Increase the sampling frequency while watching for missed deadlines. On your assignment wiki page explain:
 - At what frequency does this happen?
 - Describe how you monitored sample rate and missed deadlines.
 - What is causing deadlines to be missed?
 - What are the performance bottlenecks of your system?
 - Propose how you would increase the systems' sample rate?
 - HINT: Don't log all samples to the console. This will reduce system load and allow you to sample faster. Discuss how often you sampled on your assignment page.
 - Commit the program to your team repository under the same branch.