EMBEDDED SYSTEMS

Assignment 3

I2C PROTOCOL

- Wire the LM303DLHC Triple-axis Acceleromter +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 1Hz 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.