P542 Hardware System Design II

Lab Report 6

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Description of solution

A *while*(1) with a *non_blocking_getchar*() to listen for 't' or 'T' and a check of systick_flag. If systick_flag is set, then call scheduler. On the scheduler I sample at two different rates: 10hz and 1 hz. At 10 hz obtain samples from the gyro, accelerometer and magnetometer with respective counters to keep track of the number of samples. At 1 hz, output the respective averages and reset the counters and buffers. Also, at 1 hz, append a line of the averages, with time, to the file sensor.log.

If a 't' or 'T' is received, then I handle the user input, one piece of information at a time. I first prompt the user for the month, then day, year, hour minute and seconds. For each data, check that the number is of a valid range and then update the RTC structure.

If a 'd' is received, then delete the contents of sensor.log. This is just for debugging and testing purposes.

Description of issues

This was an issueless lab. The portion that took more time was to set up the SD card. The actual wire of the pins was easy to do and follow from the lab's instructions. For this lab I developed a function char * create_time_stamp(data and time data). This function creates, from the particular pieces of data and time, a string with the timestamp as required:

 (02/08/2013,HH:MM:SS,gyro_x,gyro_y,gyro_z,accel_x,accel_y, accel_z,mag_x,mag_y,mag_z)

This string is printed to the user and written to the SD card.