

Week 3 homework***Due date reminder***

Please email your completed assignment to the course TAs (mch6@illinois.edu and jjc11@illinois.edu cc rlongo@illinois.edu, subject: '[PHYS371]: Week 3 Homework, Your Group Number') by Thursday, 5 pm of week 4 (02/09/2023). Homework that includes only group work should be submitted by one group member, rigorously copying all the other members, the instructor and the TAs.

Each day of delay in turning in the assignment will result in a grade reduction of 10%. We will not grade anything submitted more than one week late. The use of the wildcard should be communicated to the instructor and the TAs before the deadline to turn in the homework, and it does not apply to homework that includes group work only.

When your homework submission includes one or more Arduino code files, please use the template **p398dlp_template.ino** as the starting point for your code. Please fill in *all* of the fields shown in the template file. Please use the template also to start your group code and comment on it constantly when you develop new parts. Quote the main authors of different parts of the code too. Keep the code up-to-date on the GitLab repository.

Please compress all the material related to the homework into a .zip or .tar file. If you have questions or points that you need to address, please do not wait for the last day to ask for office hours since it may not be possible to accommodate all the requests on short notice.

Problem 1.

By now, your breadboards probably have nearly all the components you'll need for your project. Please install everything you have on the breadboard and run some test code on each device, for instance, calibrating your sensors or measuring noise levels. Show us screen shots that prove that each component is working in a sensible fashion. Post your code on the GitLab repository before turning in your HW.

Problem 2.

Working with other members of your group, write a single "data acquisition program" (we call this a "DAQ") that reads/controls/... all your hardware, makes some measurements, and writes the measurement data to the SD card. Include screenshots of the system working and provide the files read from your SD card. Analyze data from at least one of the sensor on your board and provide us with some basic analysis output (e.g a histogram of some of the quantities you measured, with associated mean and RMS calculation). Post all the DAQ code to the GitLab repository of your group before turning in your homework (we will also use what is on GitLab to compute the grade).