DORDT UNIVERSITY

Engineering Department

EGR 304 LAB #6 PROJECT #2 SPRING 2020

OBJECTIVES

- Write a project proposal, develop the project, write a formal report.

REFERENCES

- You should find your own references. Books, Journals, Magazines, Web pages are all in play.

DELIVERABLES

For today the deliverable is a word-processor file that describes your proposed project and any parts that need to be ordered to support the project. This document should be developed in a collaborative style with Professor De Boer. At the end of the project a formal lab report will be required.

Checklist: Document has the team member's names?
Project includes interrupt-driven I/O?
Document includes list of major parts including the platform to be used?
Document includes ordering information for parts not in labstock.
(brand, brand's model or part number, URL).

ACTIVITIES

For this week and about the next four weeks the lab time will be dedicated to project work. The project should fit the requirements described below:

1.) The project must make use of a microcontroller or a system-on-a-chip platform (also known as a development board). The Arduino or the Raspberry Pi are recommended because Prof. De Boer has some experience with those, but if you want to propose another platform, you may talk to Professor De Boer about it.

2.) The project must include some interrupt-driven I/O. Ideally the entire functionality of the project would be object-oriented and interrupt driven (possibly via a schedule table) except for the setup, but this is not always practical so the project requirement is simply that some interrupt-driven I/O is required. The Arduino platform is recommended as it provides more straight-forward user-access to the hardware resources needed for interrupt-driven I/O. If the Raspberry Pi or another operating-system-bound platform is chosen, then the interrupt-driven I/O will have to be under the supervision of the operating system and "plan B" will have to be used. (Details of "Plan B" involves multithreaded programs and sleep-mode. Details were presented in the slides on 2/19, slide #1.)

3.) The project may be an extension or modification of your first project or it may be an entirely new project.

4.) It is likely that some parts needed for your project are not on hand in the lab. Professor De Boer is willing to order a modest amount of parts for each project. Usually they can be on hand in about one or two weeks. In the meantime, project work can continue by writing code, writing the report outline with mocked-up results, etc.

5.) A formal lab report will be due on Wednesday, March 25. That is the "absolute maximum" time extension for the lab report. The "typical" turn-in dates will be a week or two before that. The lab report must meet the standards described in the booklet, "How to Write a Laboratory Report." which will be distributed in hard copy and is available on the course's Canvas page.

6.) You may borrow entire projects from the Web or any source. Hobby-grade projects are certainly viable for this lab. Be sure to acknowledge all your sources in the formal report. Keep in mind that some hobby-grade published projects (Instructables, Nuts & Volts, WikiHow.com, etc.) have never been built, not even by the authors! Also keep in mind that the parts recommended in some projects are surplus goods or other items that may have become obsolete, are now overly expensive, or include unobtanium. Be prepared to adapt a published project to your situation. Overall, keep the scope of your project within range of completion in a few weeks. This is not a senior project!