SE101: Project Requirements

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Students, in teams of 5–6, will devise, design, develop, and demo an embedded-systems project requiring both hardware and software design and implementation. The deliverables for this project are:

- Proposal: due October 31st
- Weekly Meeting with TA
- Prototype: due December 1st
- Demo Day: December 5th
- Project Report: December 5th

The core of the hardware should be a Raspberry Pi Zero W or equivalent.

It must have an OS and a microprocessor, not just a microcontroller, and so an arduino is insufficient.

Overview

The focus of this project is the design, implementation and presentation of an embedded-systems project. While creativity is encouraged, we will be evaluating the project based on key software engineering criteria, including:

- Clearly defined requirements
- Evidence of why the project achieves its stated objectives
- Clearly documented design and architecture
- Identification of any safety concerns
- Identification of intellectual property issues
- Identification of any code-of-ethics concerns

No prior experience in using embedded systems is assumed, nor is knowing certain technologies and languages. Teams are made up of 5–6 students. Each team member is expected to put in approximately equal amounts of work, and therefore will typically recieve identical grades for the project. You are expected to use the University of Waterloo Git repository for collaboration purposes, and to make it avaiable to for grading purposes.

If you have conflict within the group you should attempt to resolve it internally first, but talk with the instructor and/or TA if the issue persists.

Weekly Meetings

During the duration of the project, you will have weekly meetings with a TA assigned to your group. These meetings serve as a weekly check-in for your project and the progress you have made. These meetings are mandatory, so please arrive every week on time.

Proposal

You are responsible for creating a proposal for your project. Some possibilities will be discussed in class. Your mark will be determined by how well you execute your project and on the difficulty of the project that you attempt. Insofar as there is a tradeoff between these two, a less-challenging, but well-executed project is preferred over an overly ambitious project that is only partially complete. If you are looking for some inspiration, check out project demos from the previous years on Learn.

Your project proposal should contain:

1. Title
2. Team Name
3. Team Number (from Learn)
4. Team Members
5. Date
6. Sections:
   (a) Summary
   (b) Software Components
   (c) Hardware Components
   (d) Challenges
      - Ideal Project
      - MVP: Minimum Viable Prototype
   (e) Project Plan
7. Limited to 1 page

As long as we have a general idea of your project through these main points, the exact formatting is not too important. Please have your project proposal submitted in PDF format by October 31st.

MVP Complete

You should have completed you minimum viable prototype and be able to demo it to your TA. It should be clear what has been done and what has yet to be done in order to complete the ideal version of your project. Your prototype showcase will be conducted with an assigned TA with whom you will discuss your project. Each team member should understand the project and be able to answer questions about it.

Video Demo Day: December 5th

For video demo day, you are to create a video showcasing your project. It should be

- 3–4 minutes long
- submitted by December 4th

We will create a single video of all projects for viewing during the lab on December 5thday.

Project Report

In addition to your demo video, you must also complete a final report. We will be providing a template for the final report, so please use it when the time comes. Here are some points to keep in mind while working on your project to facilitate the writing of your final report:

1. Background Research
2. Team members' contribution
3. References