Raspberry Pi Final Project

This is the final RPi activity (in fact, it's your final project). You may consider it more than just an activity, as it should (in theory) attempt to encompass everything (or as much of everything as possible) that you have learned in the Living *with* Cyber curriculum. Your project should contain both software and hardware combined in such a manner as to satisfy the theme of the project. It goes without saying that it should run on a Raspberry Pi.

The project is somewhat open-ended, in that you have some degree of freedom in terms of the project's topic, focus, and goals. However, your project must be approved by the prof!

Let's talk specifics:

(1) You will work **in groups of three**;
(2) You will have class time to brainstorm and work on your project;
(3) Any source code must be written in Python, unless approval otherwise is obtained from the prof;
(4) Your project may, in some way, make use of GPIO. That is, it can include input(s) (i.e., from sensors) and produce output(s) that respond to the input(s). Note that the definition of inputs and outputs is somewhat flexible;
(5) Your project must incorporate an intuitive GUI that utilizes the LCD touchscreen, unless approval otherwise is obtained from the prof;
(6) You must use github as the main repository for your project's source code and other files; and
(7) Your project will be evaluated on the following:
    (i) Complexity: does your code reflect the work of students who have been programming for a whole year?
    (ii) Efficiency: is your code wasteful with respect to space or time?
    (iii) Data structures: does your code make use of data structures (if applicable)?
    (iv) User interaction: is the GUI intuitive?
    (v) Robustness: is your code resistant to unexpected user input?
    (vi) Readability: can someone from another group (and/or the prof) read and understand your code easily?
    (vii) I/O (if applicable): does your project leverage the benefits of GPIO that the RPi offers?

Deliverables include:

(1) Initially (**this will be delivered at the beginning of the project and must be approved by the prof before you actually begin working on your project!)**:
    (i) A brief writeup of your project that summarizes it (note that you must include justification that your idea can be translated into a project that can be completed by a group of three-ish students in the alloted time).
(2) At the conclusion of the project:
    (i) All source code;
    (ii) If using GPIO and a circuit, both a circuit diagram (schematic) and layout diagram **(done in Fritzing)**;
    (iii) A BOM (bill of materials; i.e., a parts list), if applicable;
    (iv) A link to your github repository for the project; and
    (v) A final presentation of the project.

Note that all files (source code, images, circuits, etc) should be compressed **in a single ZIP file** (not RAR, etc).

The final presentation should be approximately **5 minutes per group**. Everyone in your group should speak during the presentation. It should include the following:

(1) A good overview of the project (i.e., what its goals are, how it works, why it is relevant, etc);
(2) A demonstration of your project; and
(3) Any future development plans and lessons learned.

Raspberry Pi Final Project **EVAULATION**

I am a: _____Student _____Faculty Other (specify):_____

Group members: _____

_____

Project title: _____

_____

Organization and clarity (1) Is the presentation organized in a logical manner?	**5 pts**	_____
Technical content (1) Is the difficulty level appropriate (i.e., was the project nontrivial)? (2) Is the material presented technically sound? (3) Is the project relevant to the specified topic(s)? (4) Does the project include a discussion of hardware and software components as applicable, intuitive GUI as applicable, future development plans, and lessons learned?	**65 pts**	_____
Timing (1) Was a 5 minute presentation delivered (+/- 1 minute)?	**5 pts**	_____
Demonstration (1) Did the demonstration work?	**10 pts**	_____
Delivery (1) Do the presenters make eye contact with the (entire) audience? (2) Are the presenters expressive in voice, posture, and movements? (3) Did all group members participate in the presentation (i.e., did they all speak)?	**15 pts**	_____
TOTAL	**100 pts**	_____