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| Project Name: Current Master | | | | | | | | | | | | | | | |
| Student Name: David Barbour | | | | | | Capstone Date: 4/19/24 | | | | | | | | | |
| Project Motivation and Overview:  I’m interested in methods to remotely manage devices and power consumption. The application for this are   1. Lock down equipment to users who are trained (i.e. in a complex manufacturing environment) 2. Charge users for usage (an RV park) 3. Manage calibration/maintenance intervals for equipment 4. Budget capital spending based on equipment usage over usable life. 5. Turn off an electrical circuit after a predefined amount of electricity is used.   This device is installed between the power receptacle and a given electrical device. In order for the user to turn on the power, they must scan their fingerprint. If the print is recognized, the electrical socket is enabled. While the user is logged on, all electrical activity is gathered. Every few minutes a cumulative record of usage is sent to the cloud to be recorded.  All devices can be managed via a central user application installed on a PC.  Minimum Features:   * User logs on to device with finger print. * Electricity is disabled when no user is logged in, or user logs out * Build enclosure, display status to user via OLED, status lights * User can manually restart device   Desired Features:   * Authorization for the device is requested and received from Azure cloud web service. Electricity is enabled * Data is stored in Azure SQL server instance for data analytics     Stretch Goal Features:   * Device can be remotely disabled * Status displayed on online excel spread sheet * Front end application to manage users/equipment | | | | | | | | | | | | | | | |
| Anticipated Components:   * Photon 2 * OLED screen * Neo Pixel * ZFM-20 Series Fingerprint Identification Module * NCD 1-Channel On-Board 20-Amp AC Current Monitor * 3/5v Relay Module 1 Channel Opto-Isolate High Level Trigger * Two buttons | | | | | | | | | | | | | | | |
| Concerns and Considerations (Project Risks and Potential Mitigations)   * Because it is unknown, I’m concerned that I may not get the web service interface working with the Azure cloud. If this doesn’t work, I’ll publish results to the Adafruit MQTT server instead. | | | | | | | | | | | | | | | |
| Other Information: | | | | | | | | | | | | | | | |
| Project Implementation Timeline: | | | | | | | | | | | | | | | |
| Tasks | F | Sa | Su | M | Tu | W | Th | F | Sa | Su | M | Tu | W | Th | F |
| Project Plan | X | X | X | X |  |  |  |  |  |  |  |  |  |  |  |
| Test Components |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |
| Complete program flow and code |  |  |  |  | X | X |  |  |  |  |  |  |  |  |  |
| Build Enclosure and mount hardware |  |  |  |  |  |  | X | X |  |  |  |  |  |  |  |
| Documentation |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |
| Hackster and presentation |  |  |  |  |  |  |  |  |  |  |  | X | X |  |  |
| Slack in schedule |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |
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| Capstone Presentation |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |