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### Group 3 Practicum Ideas

Our three choices consist of these projects:

**(CHOSEN) Secret Password Lock:** Phoneme-activated lock box. Using the open source uSpeech software for microcontrollers, which is a simple phoneme-parsing software, we would code a servo lock to respond to the presence of a phrase or word. The lock, attached to the frame of a small box, would protect the contents until its microphone detected the presence of the word. The user base would be either consumers or industry as both domains have good reason to have a password protected lockbox.

Sensor: Microphone  
Controller: ATMEGA 32u4  
Actuator: Servo lock

**Theremin Lock:** Light/Tone activated lock box. Using simple components to generate a theremin, we will make a lock that responds to the generation of certain tones. Since playing a theremin involves waving your hand through a field to generate tones, we are effectively making a lockbox that opens to a series of gestures, with the tones creating feedback to help the user. Software would interpret the sounds through a microphone and identify if the correct ones were received, and then trigger a GPIO pin signal to a servo lock. The user base would be either consumers or industry as both domains have good reason to have a password protected lockbox.

Sensor: Microphone, photocell  
Controller: ATMEGA 32u4  
Actuator: Servo lock

**Ocarina Lock:** Music activated lock box. Using the same basic structure as the theremin lockbox, but without the theremin. This would still be a lockbox that opens to a series of tones, but the tones could be generated by any instrument. (In our case, an ocarina.) Software would interpret the sounds through a microphone and identify if the correct ones were received, and then trigger a GPIO pin signal to a servo lock. The user base would be either consumers or industry as both domains have good reason to have a password protected lockbox.

Sensor: Microphone  
Controller: ATMEGA 32u4  
Actuator: Servo lock

All of them have similar foundation but the complexity of the implementation of the software will differ slightly. We will begin looking into the secret password lock and if anything falls through, switching to any of the two other projects should be no problem. If we are ahead of schedule, we would attempt to include a response to music in our Secret Password lockbox.