**HDD for the Summative Computer Engineering Project**

**Hardware Design Document for the Summative project for Grade 11 Computer Engineering**

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I have decided that for my summative project, I will construct either an arduino security lock. This will incorporate most of what we have learned and also include new modules of the arduino kit that we have not yet used. On top of that, to include the networking unit, the arduino will incorporate a GPRS or networking shield to send and receive user data during the usage of the lock. The main reason why I want to make this project is to really challenge myself and see how far I can go while still using an arduino development board. I also wish to try and develop a security system with virtually no vulnerabilities to most threats.

The gist of the project will be to design an arduino device with a wifi chip and a keypad (the actual lock won’t be incorporated into the design as it is just for demonstrative purposes (simply activate a solenoid that would retract a bolt). An LCD will also be used to show whether the lock is open or closed, the password you typed in, etc. When a passcode is typed into the lock, a notification (most likely in terms of a text message) will be sent to the phone number of the owner (which will be determined during the lock setup). It will notify the owner of the attempt to open the lock and wait for an input (if it is the correct password) (this will also as a text message, either “accept” or “deny”) effectively a two step authorization process (if the password is incorrect, the owner will simply receive a notification warning of a potential security hazard. At this point, the LCD will also display a warning of 1 of 3 attempts before a 1 hr lockdown period. If more than 3 of these cycles (3 attempts and 1 hr waits) are performed and the password is still wrong, or if the casing of the lock is opened (will be simulated by breaking the contact or 2 magnetic switches/sensors), the owner will receive a notification asking if they want to notify the authorities.). A fingerprint scanner will then be activated to confirm the identity of the owner. If the identity is then identified as correct, the lock will open and the owner will receive a notification of the lock being successfully unlocked while the LCD displays a welcome message. If the fingerprint is detected as different after 5 attempts, the lock will lockdown for 3 hours and the owner will be notified with a new temporary passcode (as the current one is most likely breached) as well as the warning of potential security threats.

In this case, since my idea is original, my original contribution is the entire project. During it, I did not employ any external scripts or code that isn’t mine, allowing me to claim full credit for the development.