Locker Design

Design: The prototype lockers are heavily based on that of “French Toast Philip”, whose video tutorial can be found at https://www.youtube.com/watch?v=8gzh95w4Hmk. Our initial design is nearly identical to his, and consists of the following parts:

1x arduino uno board

1x sg90 tower pro servo motor

3x 1kohm resistor

1x breadboard

1x hc 06 bluetooth module

4x male-female jumper wires

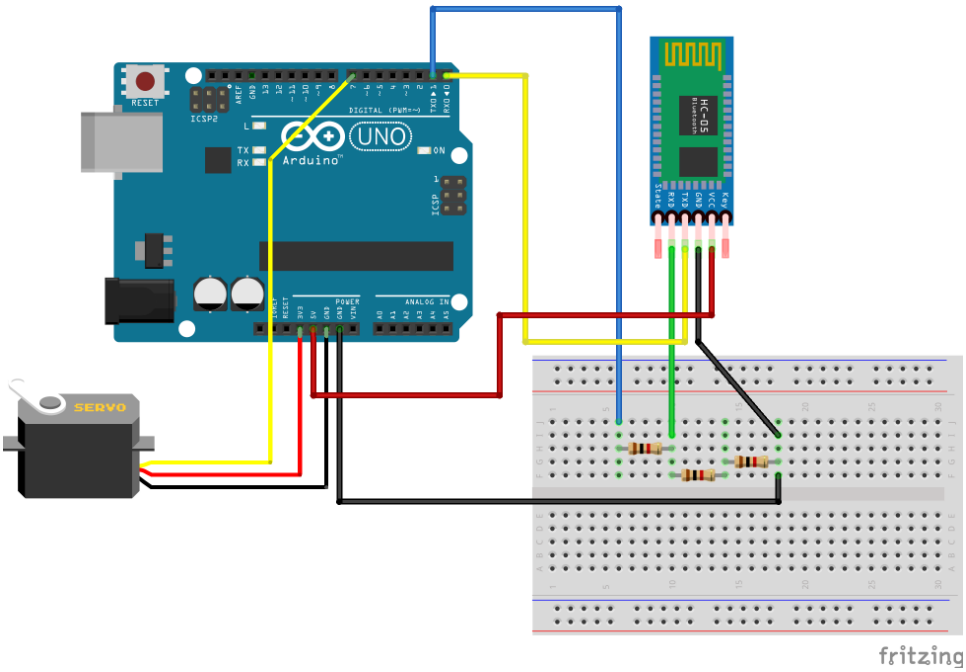
6x male-male jumper wires

1x basic sliding bolt door lock

1x paper clip

Velcro strips for affixing components

And the wiring was done largely according to the circuit diagram provided by Philip:



It should be noted that this wiring is only suitable for a servo motor that functions from the 3.3v pin of the arduino. The servos we obtained require 5v so the breadboard connections are used to allow the bluetooth module and the servo to both draw power from the 5v pin. Once the wiring is complete, the servo arm is attached to the sliding bolt of the lock using the bent paperclip. The arduino sketch, also originally based on Philip's, is then uploaded to the arduino using a USB type A/B cable. The locker is now functional, and will interact with Pinaka and Asthra once it is properly entered into the appropriate databases.

Our Changes: The above design is suitable for locking and unlocking, but requires drawing power from the USB connection. The second iteration of our locker design adds a 9v battery and a 9v battery cap, and uses the V-in pin to supply power. This also introduces a third device that requires grounding, so the breadboard connections must now be used to accommodate this. After making these changes, the locker is battery powered.

Recommended Changes: The breadboard can be removed entirely from the design and all connections can be soldered directly when moving to an improved, more final design. Our current battery power supply would likely work better as a draw from a central power source for the entire locker system, to avoid the need to frequently replace batteries for individual lockers. The connection between the servo motor and the lock is currently weak, and should be replaced with something more secure for actual use.

Differences from Source: The original arduino sketch from Philip's design should not be used. It does not account properly for values on a new arduino board's EEPROM, and the unlocking feature of the applications will not work. The arduino sketch we have produced will properly set the arduino board's EEPROM if the appropriate values are not already present.