"Arduino Lock – Key Model"

Apparatus Used :-

Electronics:

- Arduino Nano
- Bluetooth Module
- 90g Servo Motor
- Computer with arduino IDE

How It Works

- The idea is that I can easily lock and unlock my door without having to carry a key or even go near it :D but this is only a fraction of what we can do. From here we could add a sensor like a knock sensor so we can unlock our door with a special knock or even a voice recognition system!
- The servo arm will be connected to the slider lock and will move to 0 degrees to lock the door and 60 degrees to unlock it using commands it gets from out Bluetooth device.

We started by wiring the servo to the Arduino (I would like to note that even though i'm using the Arduino nano the Arduino uno will work just as well with the exact same pin layout)

- The **Brown** wire on the servo is ground and it gets connected to **ground** on the Arduino
- The **Red** wire is positive and it gets connect to **5v** on the Arduino
- The **Orange** wire is the servos source connection and it gets connected to **pin 9** on the Arduino

Now we would test the servo by going to examples in the Arduino IDE and select sweep. When the servo works we can add the bluetooth module. We connected the rx pin on the bluetooth module to the tx pin on the Arduino and the tx pin on the bluetooth module to the rx pin on the Arduino while these connections are made nothing can be uploaded to the Arduino so we uploaded the code before soldering.Then we wired the bluetooth module to the Arduino

- **Rx** pin on the bluetooth module connects to the **Tx** pin on the Arduino
- **Tx** pin on the bluetooth module connects to the **Rx** pin on the Arduino
- **Vcc** (positive) on the bluetooth module connects the **3.3v** on the Arduino
- **Ground** goes to **Ground**

Testing

Then we had all the parts together and the servo is strong enough to push and pull the locking mechanism without a problem before we started designing the final concept we built a mock up just to make sure my servo was strong enough.

Electronics Casting

We decided to leave servo "exposed" and to only build a small cardboard case to protect the arduino nano and Bluetooth module. We builded that by tracing the around the arduino nano onto a peice of cardboard and add about 1 cm (0,39 inch) of space onto each side now we have to cut out the other 5 sides of the rectangular cube. We also have to cut a hole on one of the faces for the power cord to connect to the arduino.

The measurements for the case are:

- Bottom piece = 7.5cm by 4cm (2.95 by 1.57 inch)
- Top piece = 7.5cm by 4cm (2.95 by 1.57 inch)
- left piece = 7.5 cm by 4cm (2.95 by 1.57 inch)
- Right piece = 7.5 cm by 4cm (2.95 by 1.57 inch)
- Front face = 4cm by 4cm (1.57 by 1.57 inch) (cut power hole in this one)
- Back face = 4cm by 4cm (1.57 by 1.57 inch)

The App

So to lock and unlock the door we need a device running on android. We connected the hc-05 to our phone. Once its paired open the app, click on options and tap connect to device (insecure) now our phone is basically simulating the arduino serial monitor which means we can see and send information coming from the arduino.

If you type 0 and press enter you should see the door lock and see the message "door locked"

and when you type 1 and press enter you should see the door unlock and see the message "door unlocked"

Power Supply

We need a power supply, the cable and usb mini plug to connect to the arduino.

We connected the ground connection on the power supply to the ground connection on the usb mini port and connected the red cable to the red cable on the usb mini port now lead the cable from the lock to one of the door hinges and from there lead it to a power outlet