BOX AND LOOP

Iron Man Helmet
MK5

Wiring Guide

Thank you! And Welcome!

This wiring guide accompanies the STL files you've downloaded in order to build your own Iron Man MK5 helmet. In order to properly assemble the helmet, all of the wiring needs to be done prior. Let the parts print while you wire all the electronics up.

The Complete Wiring Diagram shows all the connections, including locations for JST connectors. While those connectors are not necessary, they do make the build much easier. You will need a crimping tool and a good wire stripper.

Detailed steps include pin information as well as wire length needed.

Component	Count
Arduino Nano	1
Adafruit PCA9685	1
Wing Servo	2
9g Servo	8
Battery Pack	1
Limit Switch	1
Slide Switch	2
Capacitor	2
LED eye panels	1 pair
JST Connector kit	1
Wire (4 colors, 26 gauge)	1 set
Angle USB (Left and Right)	1 pair

Uploading code to Arduino Nano

Step 1. Close all slicing software
Step 2. Open Arduino IDE
Step 3. Plug in your Arduino Nano
Step 4. Open mk5-sketch.ino
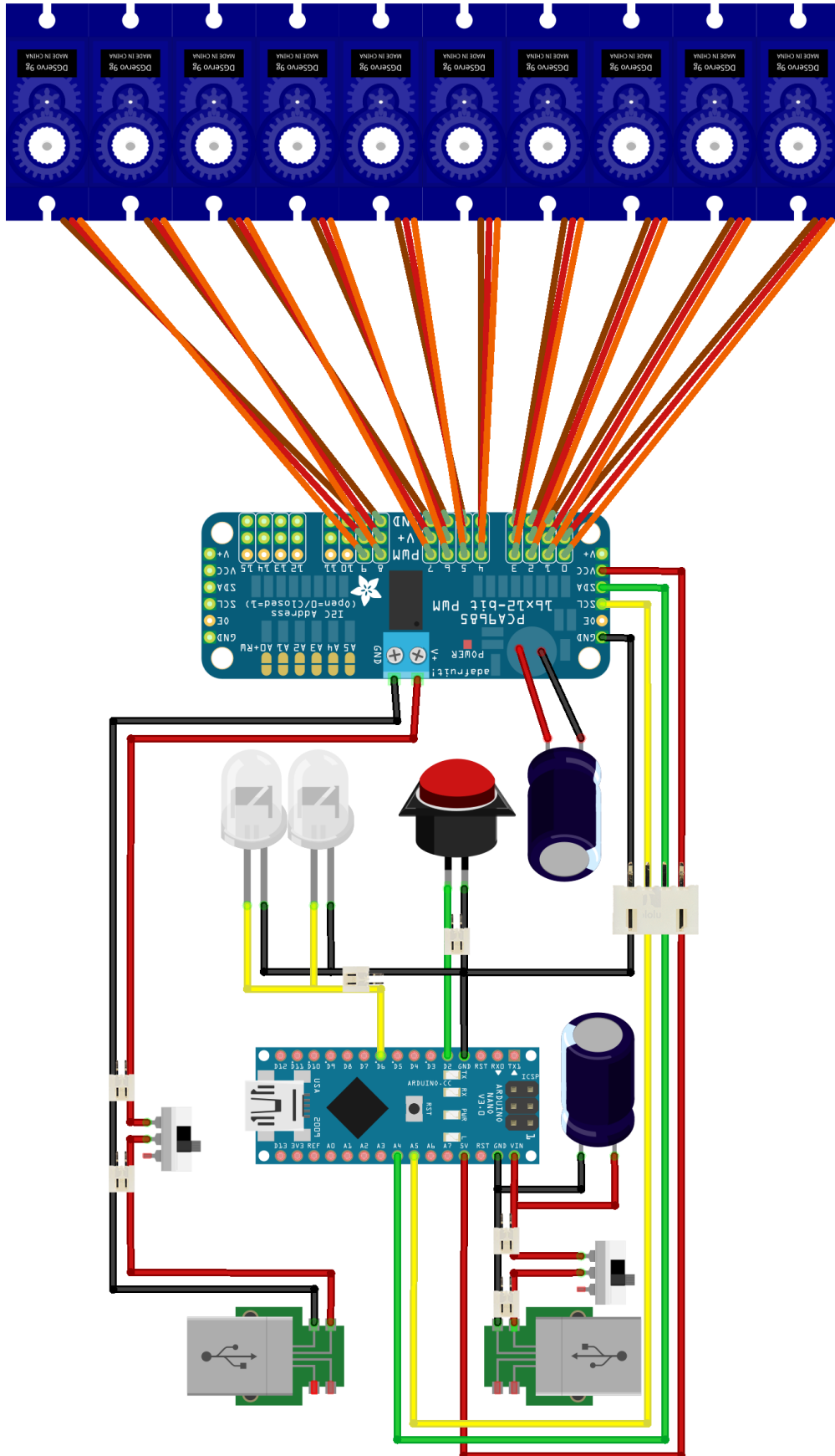Step 5. Go to "Tools" - "Manage Libraries..."
Step 6. Type in "adafruit pwm"
Step 7. Select "Adafruit PWM Servo Driver Library " and install
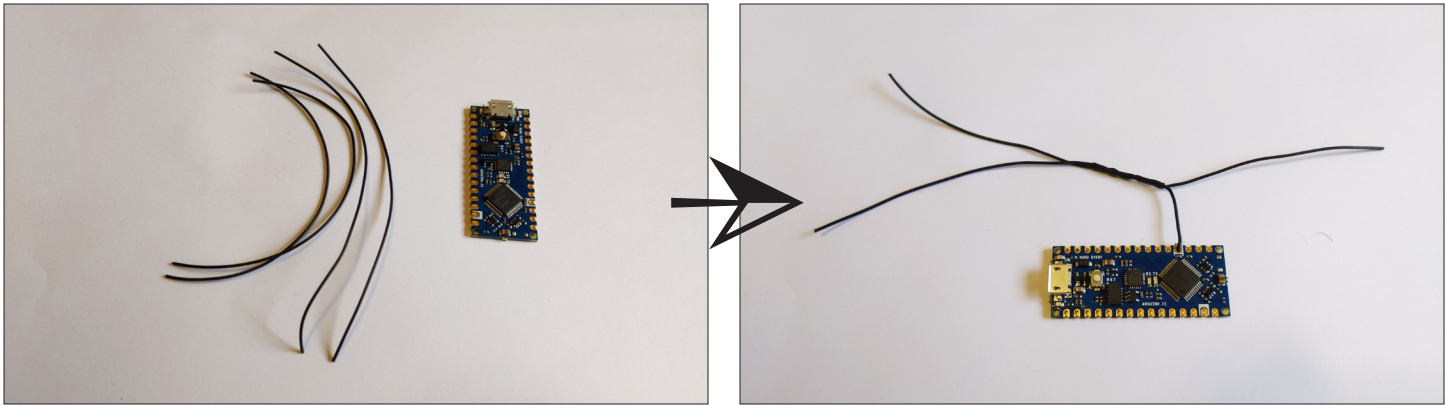Step 8. Go to "Tools" - "Board" and find Arduino Nano (or Arduino Nano Every)
Step 9. Go to "Tools" - "Port" and select the port that dissapears when you unplug your Nano
Step 10. Go to "Sketch" - "Upload" and your Arduino Nano is ready!
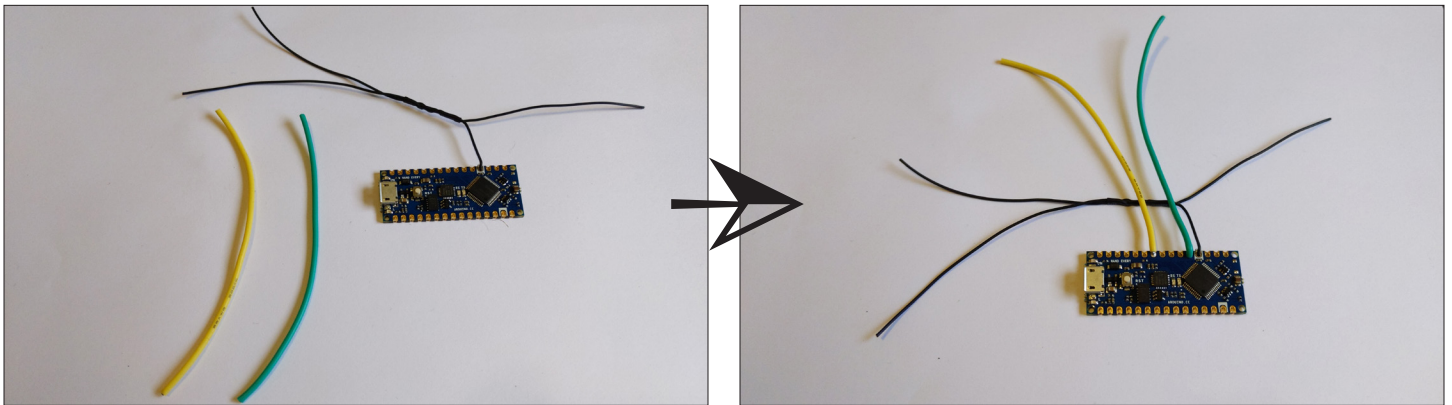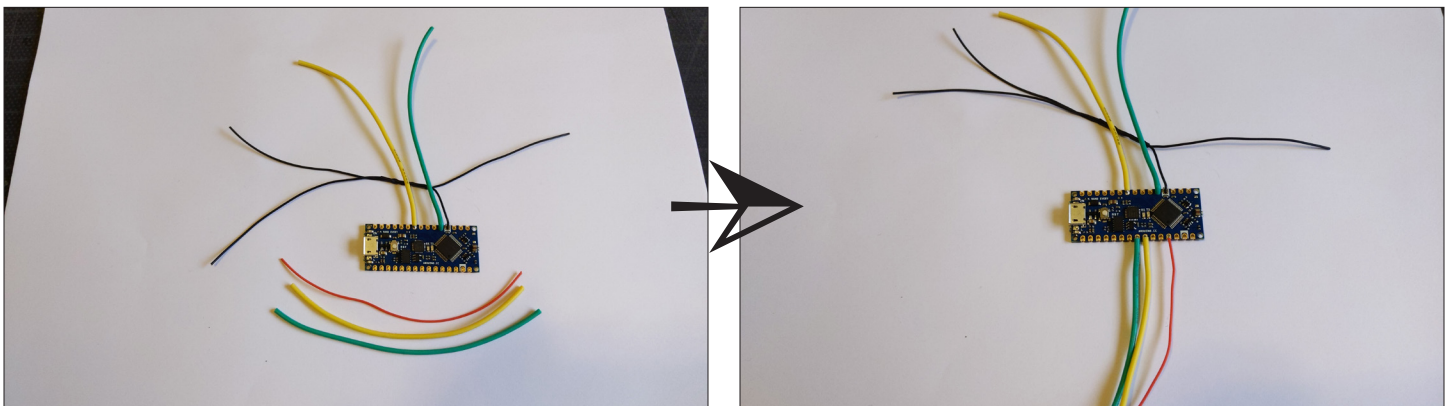
Complete Wiring Diagram

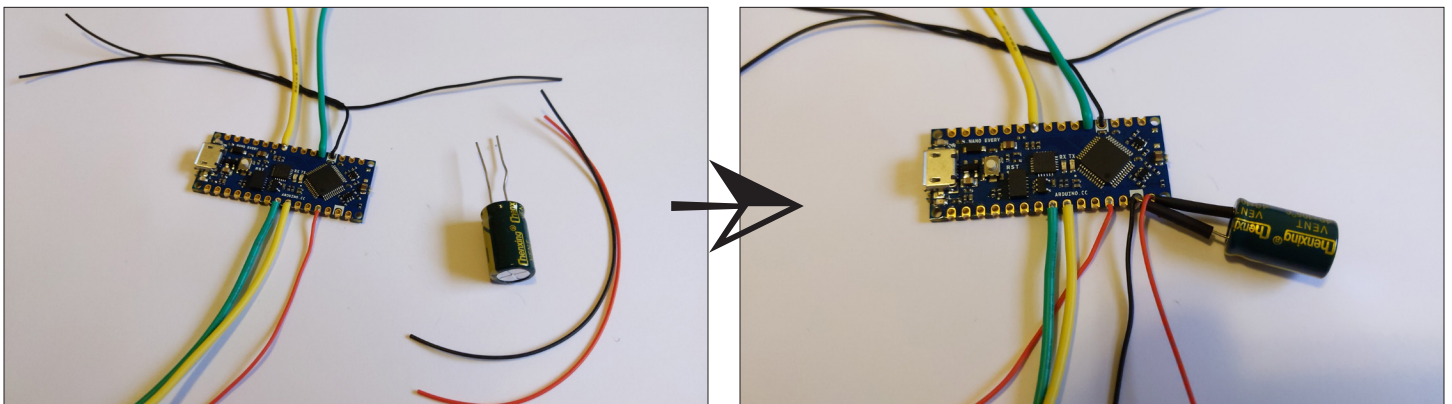## Step 1: Wire 3-way split for Arduino GRD (length: 60mm)

Step 2: Wire D2 for button and D6 for eyes (length: 60mm)
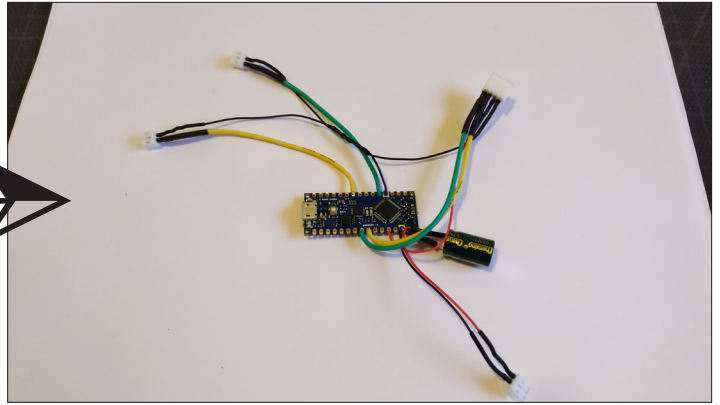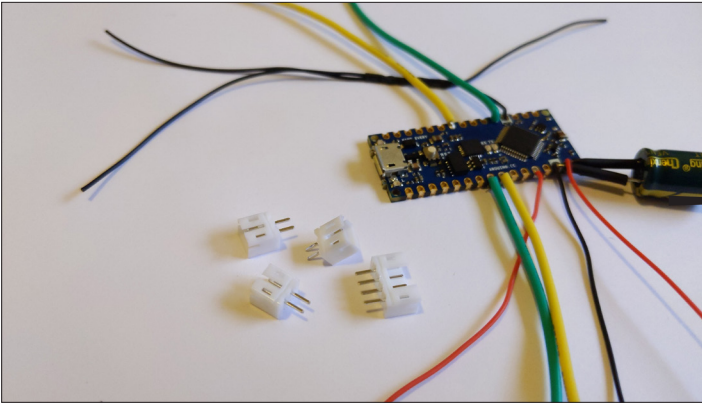

Step 3: Wire A4, A5 and 5V for PCA9685 (length: 60mm)

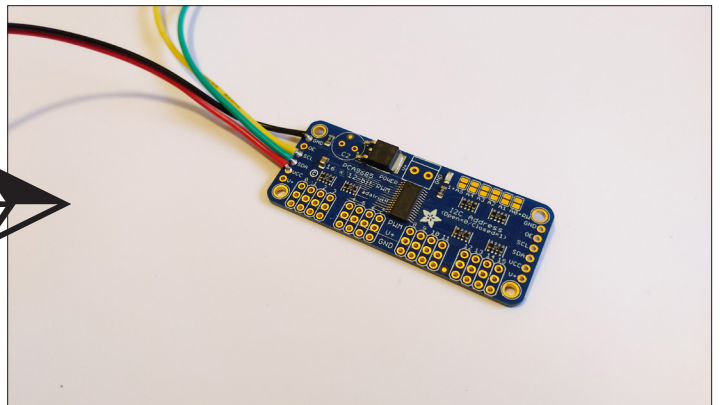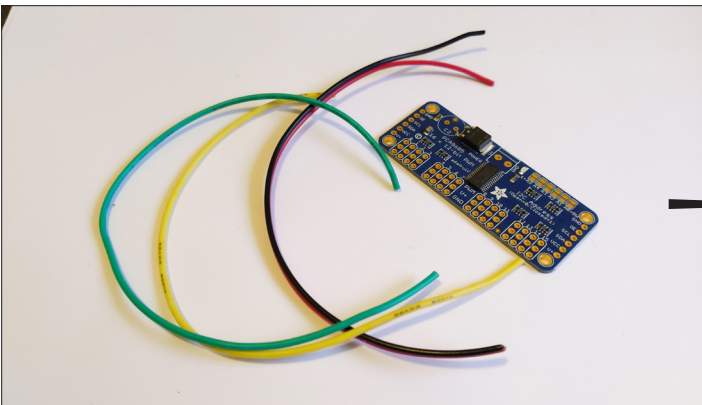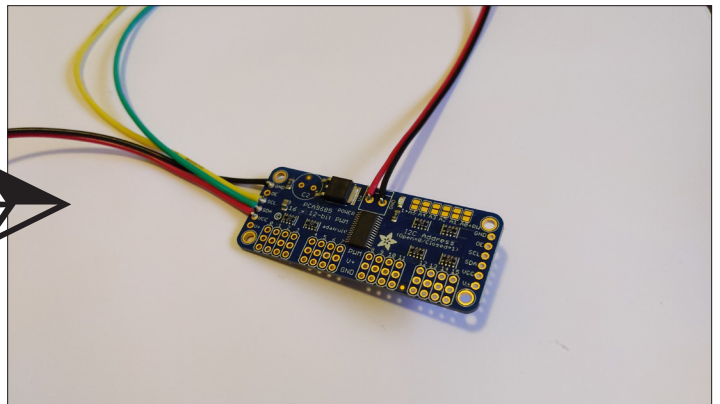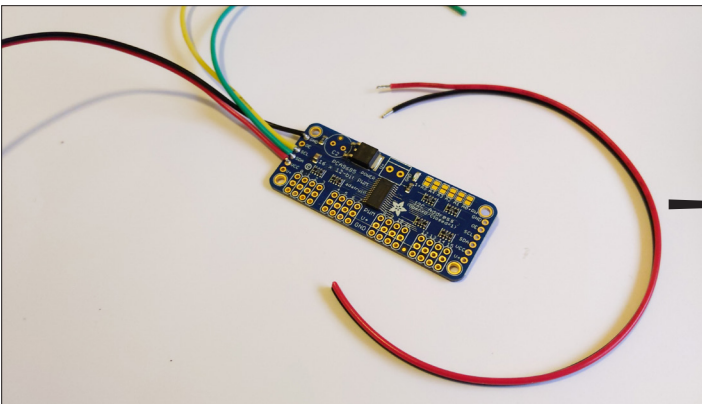## Step 4: Wire GRD and VIN with capacitor for power (length: 60mm)

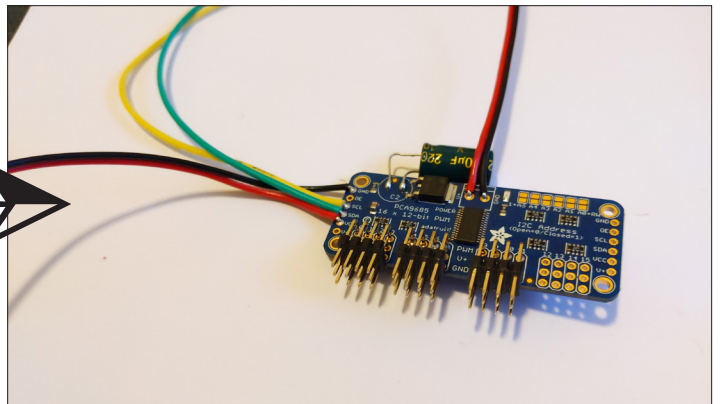Step 5: Attach JST connection for eyes(2), button(2), PCA9685(4), and power(2)
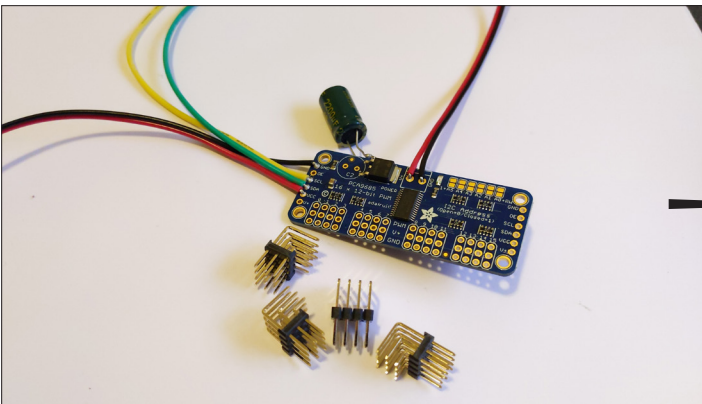
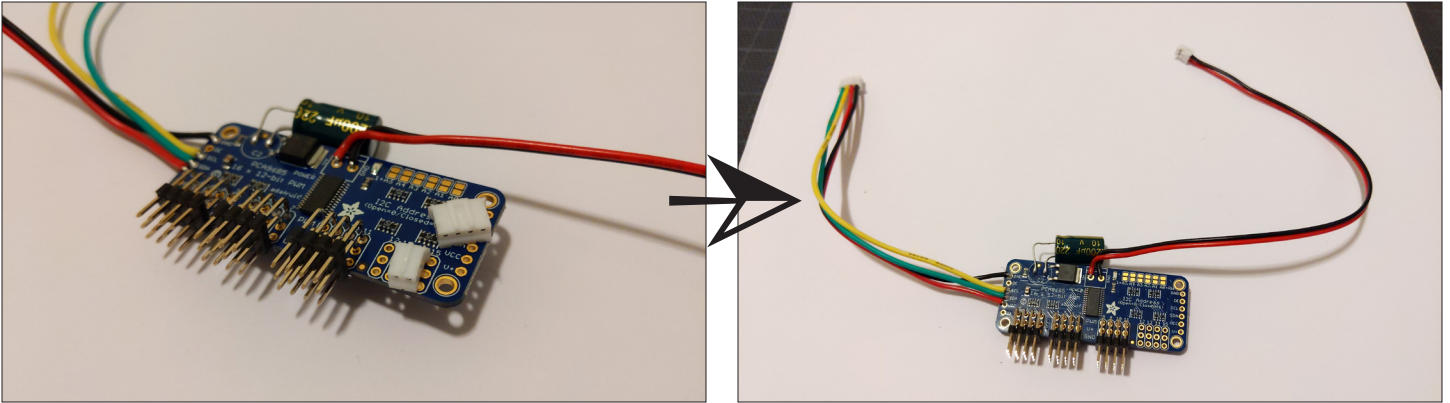Step 6: Wire VCC, GRD, SCL, and SDA on PCA9685 (length: 150mm)

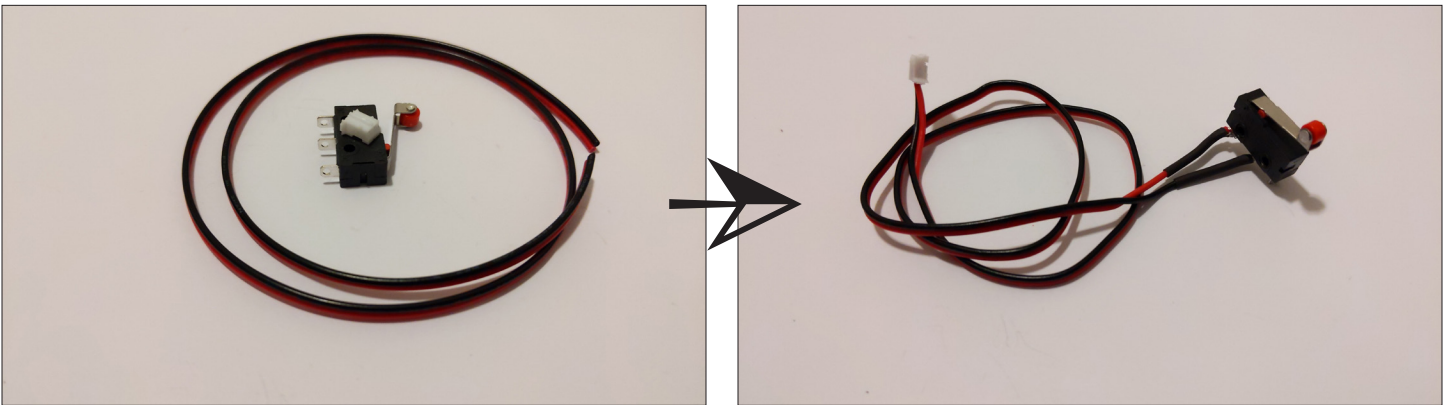Step 7: Wire V+ and GRD on PAC9685 (length: 200mm)

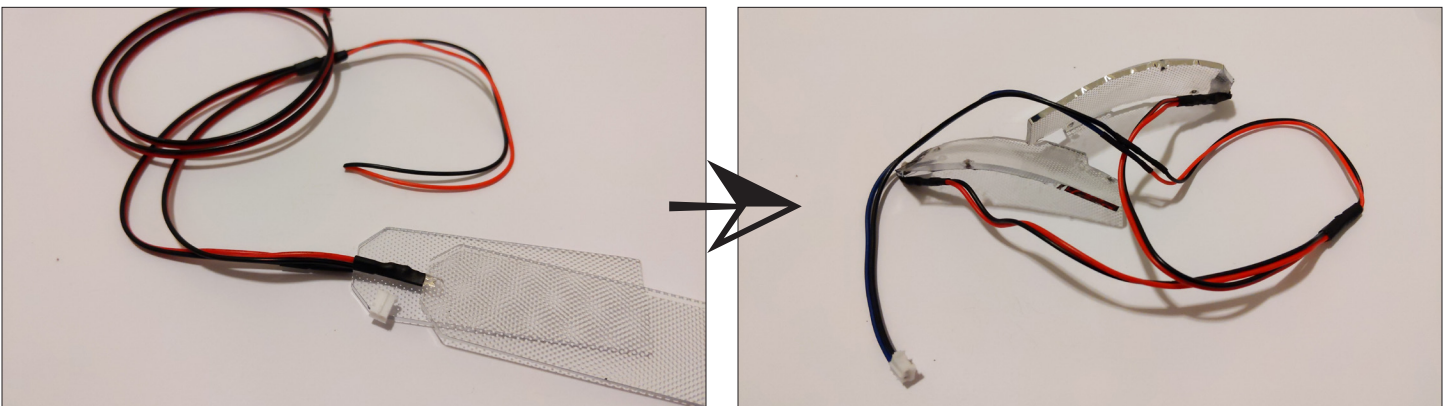Step 8: Attach the capacitor and headers to PCA9685

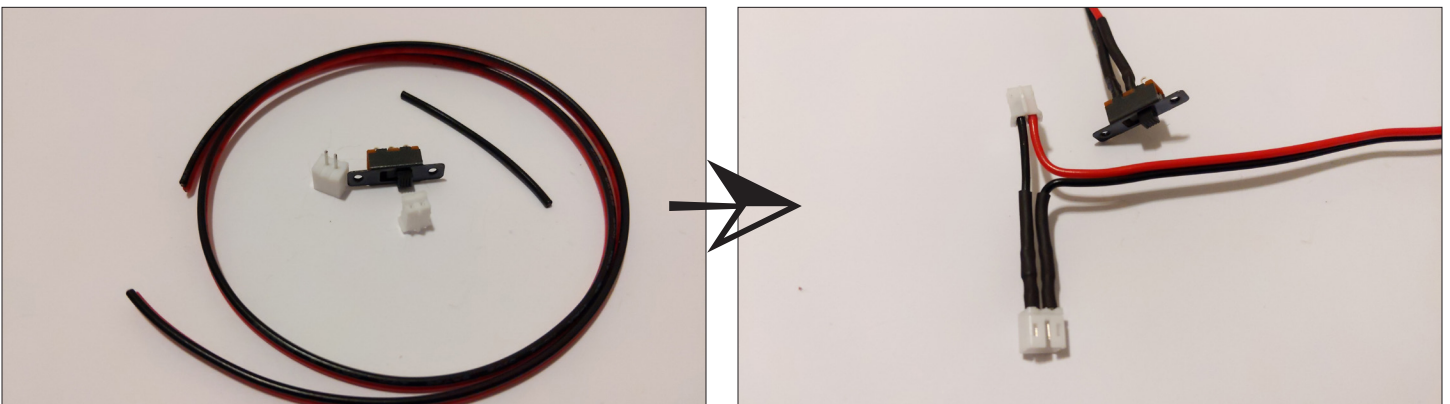## Step 9: Attach JST connection for Arduino(4) and power(2)

Step 10: Wire and Attach JST connection to limit switch/button (length: 500mm)

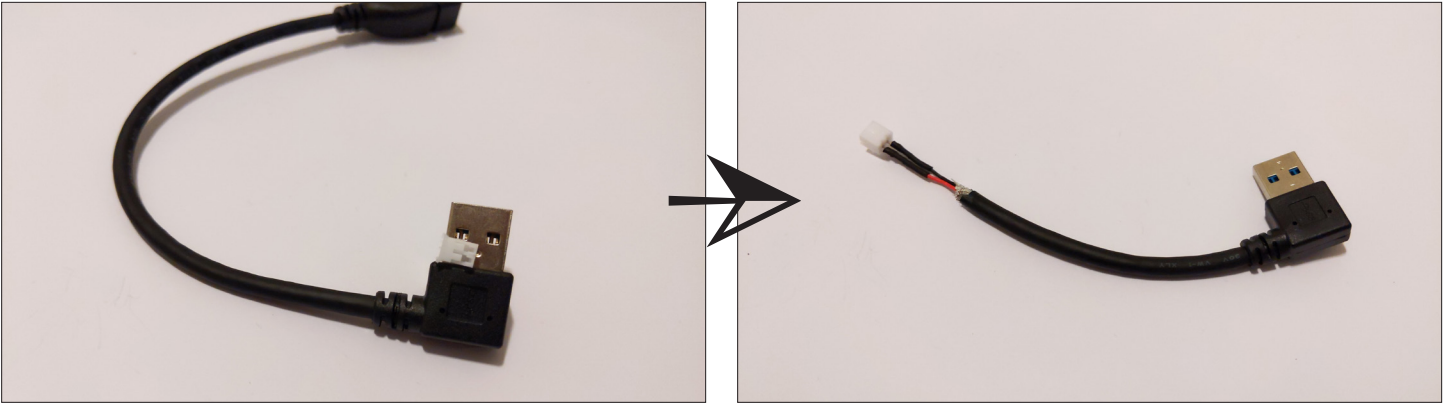## Step 11: Attach JST connection to eyes (length: 500mm)

Step 12: Wire and Attach 2 slide switches to male and female JST connectors (length: 500mm)
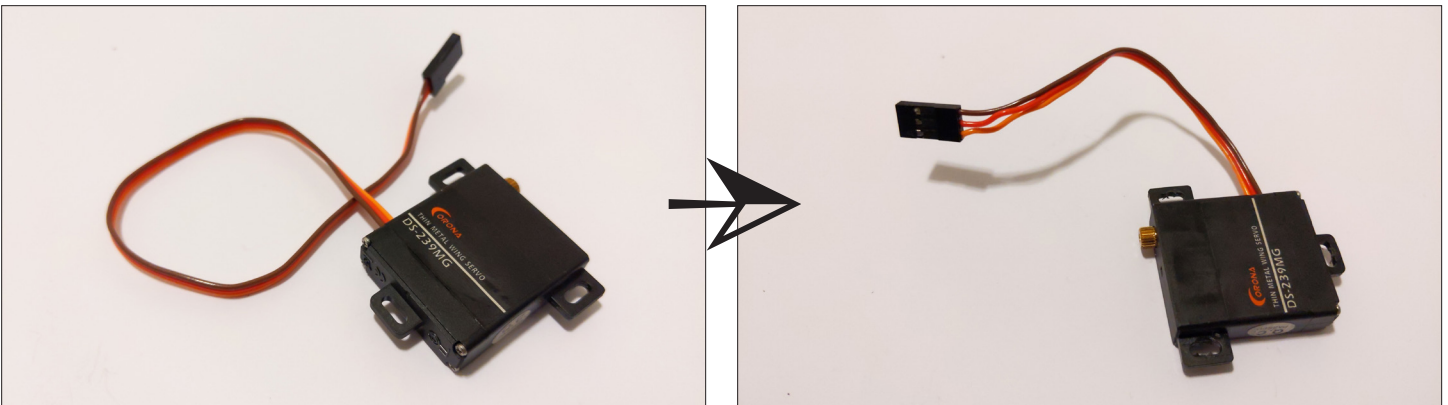
Step 13: Cut USB (Left and Right) cable wires and attach JST connectors to red and black wires

Step 14: Cut or Extend wires for servos per length chart below and reattach the connectors:

Servo	Length (mm)
0 (WING SERVO)	80
1 (WING SERVO)	110
2 (9g SERVO)	190
3 (9g SERVO)	190
4 (9g SERVO)	200
5 (9g SERVO)	260
6 (9g SERVO)	310
7 (9g SERVO)	350
8 (9g SERVO)	380
9 (9g SERVO)	380

Step 15: Upload the code to Arduino. Connect everything and you are ready to build!