

PyFirmata

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Agenda

- Part I: Motivation
- Part II: Firmata
- Part III: Demo
- Part IV: Summary
- Part V: Q&A

Part I. Motivation

..Human-Computer Interaction

..Serial Port Reading Data

HCI

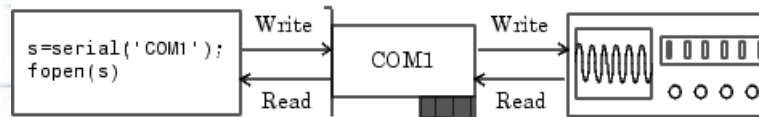
簡介:

人機互動介面，使用者可見的部分，透過軟硬體與系統交流，並進行操作。

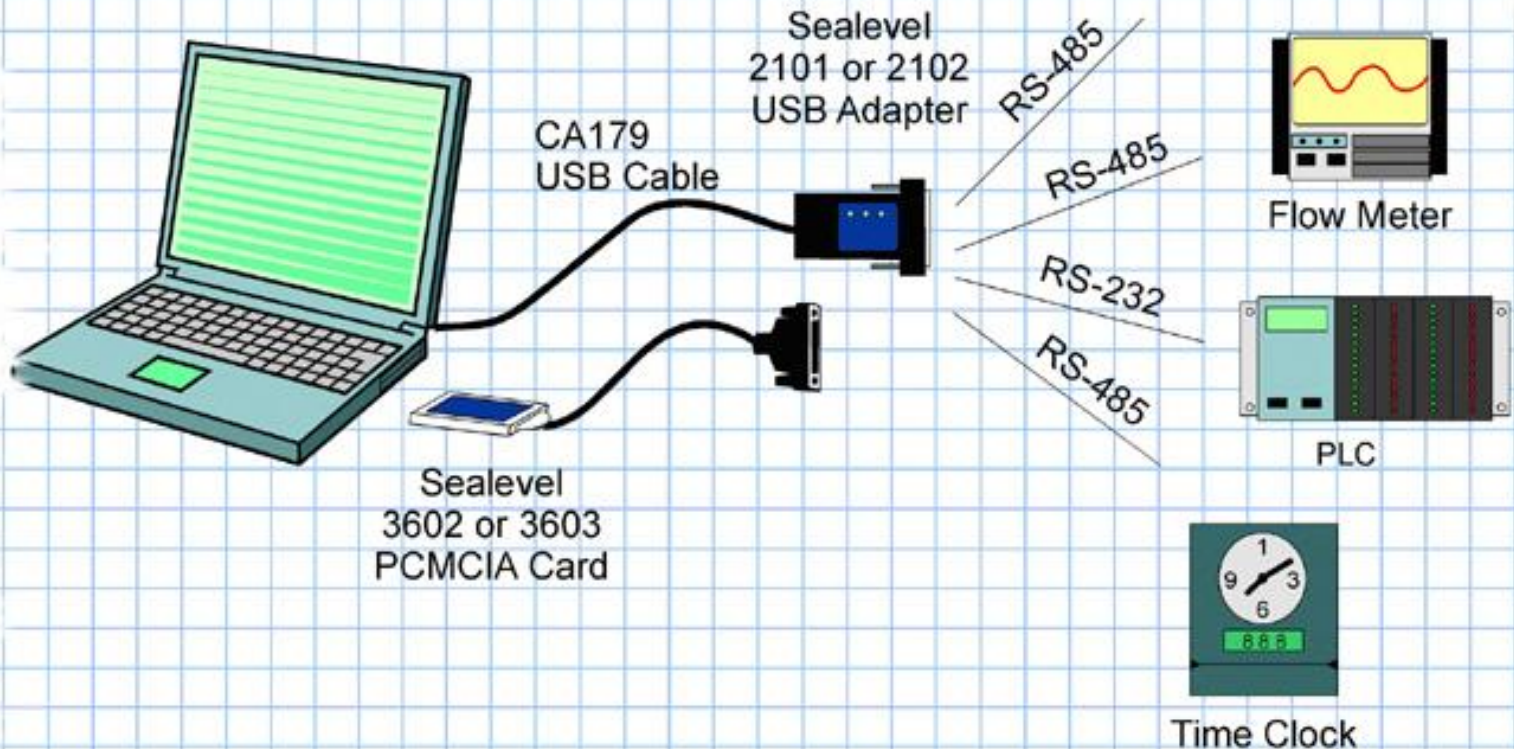
- 花博



Serial Port Reading Data



Temperature Controller



Part II. Firmata

..Firmata 簡介

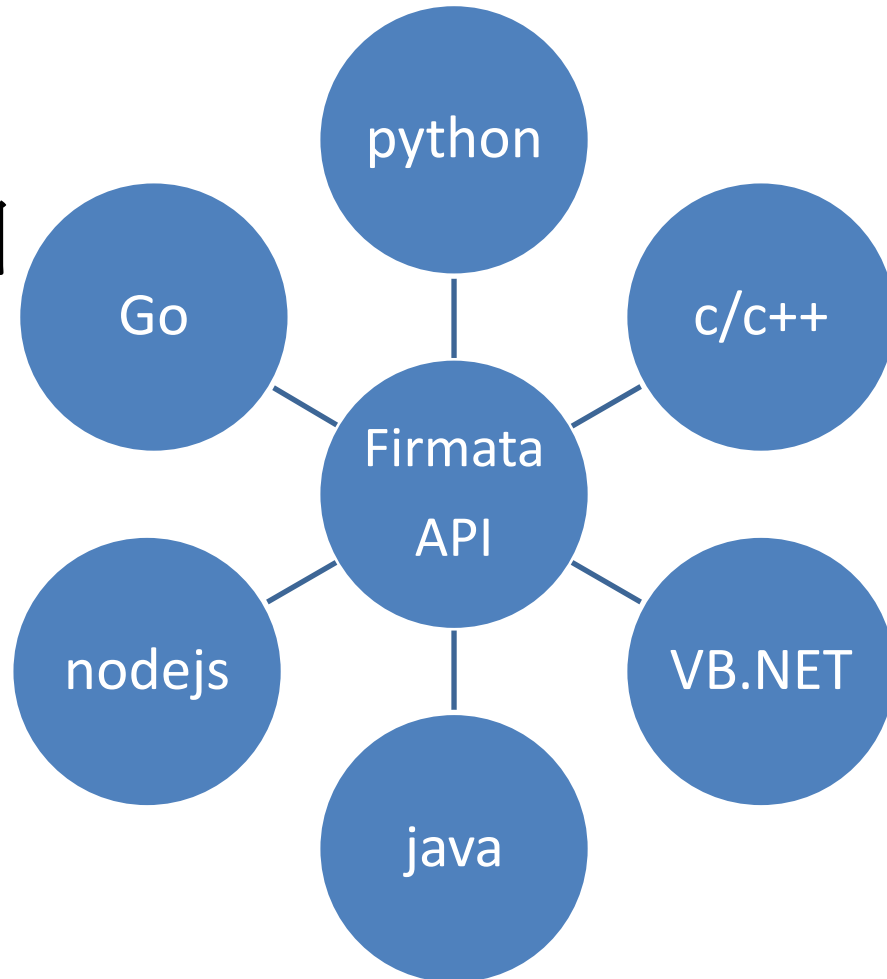
..Arduino 簡介

..firmatata 安裝

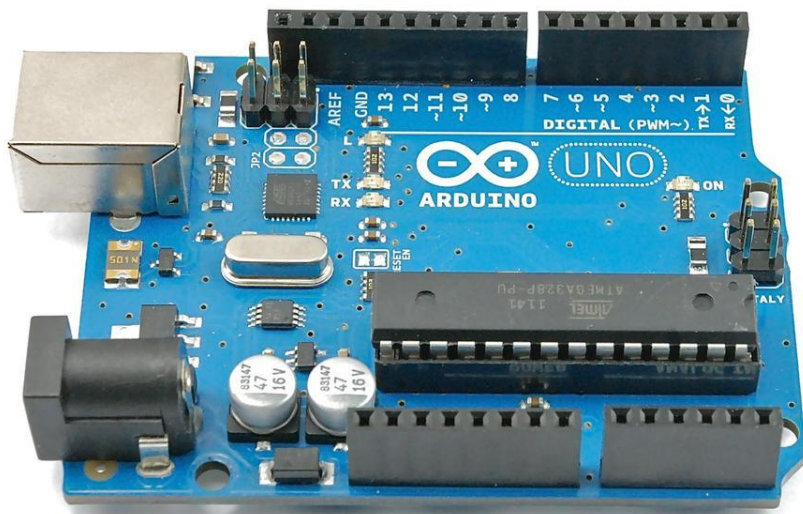
Firmata

簡介:

一個PC與
MCU通訊的一個
常用協議



Arduino: open hardware



名片大小

釘書機大小

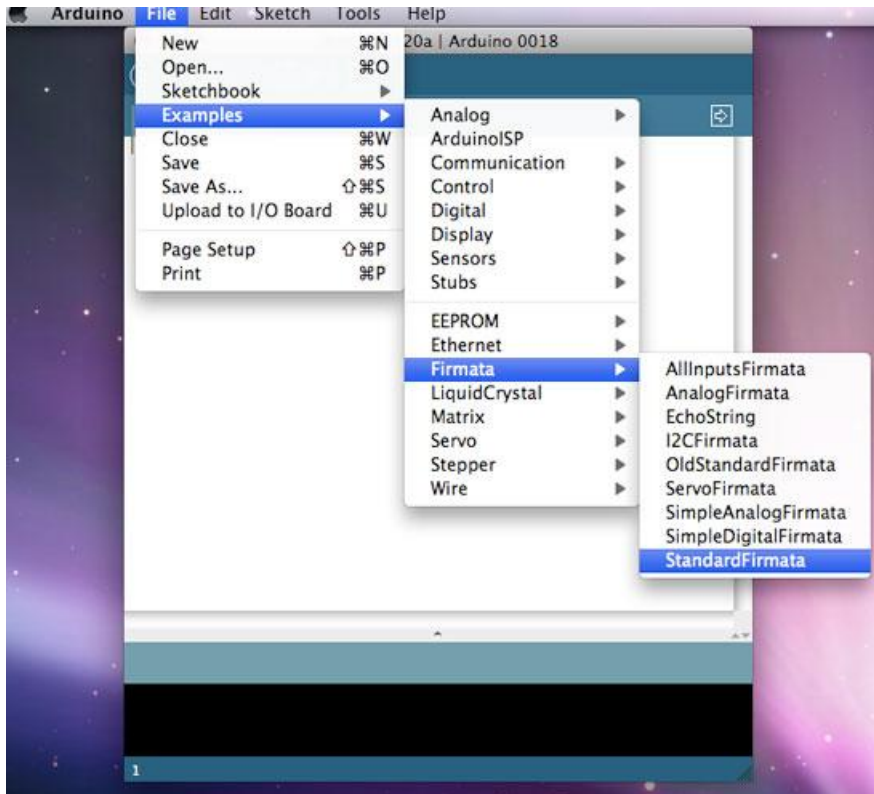
錢幣大小

郵票大小



Firmata 安裝

Arduino IDE upload



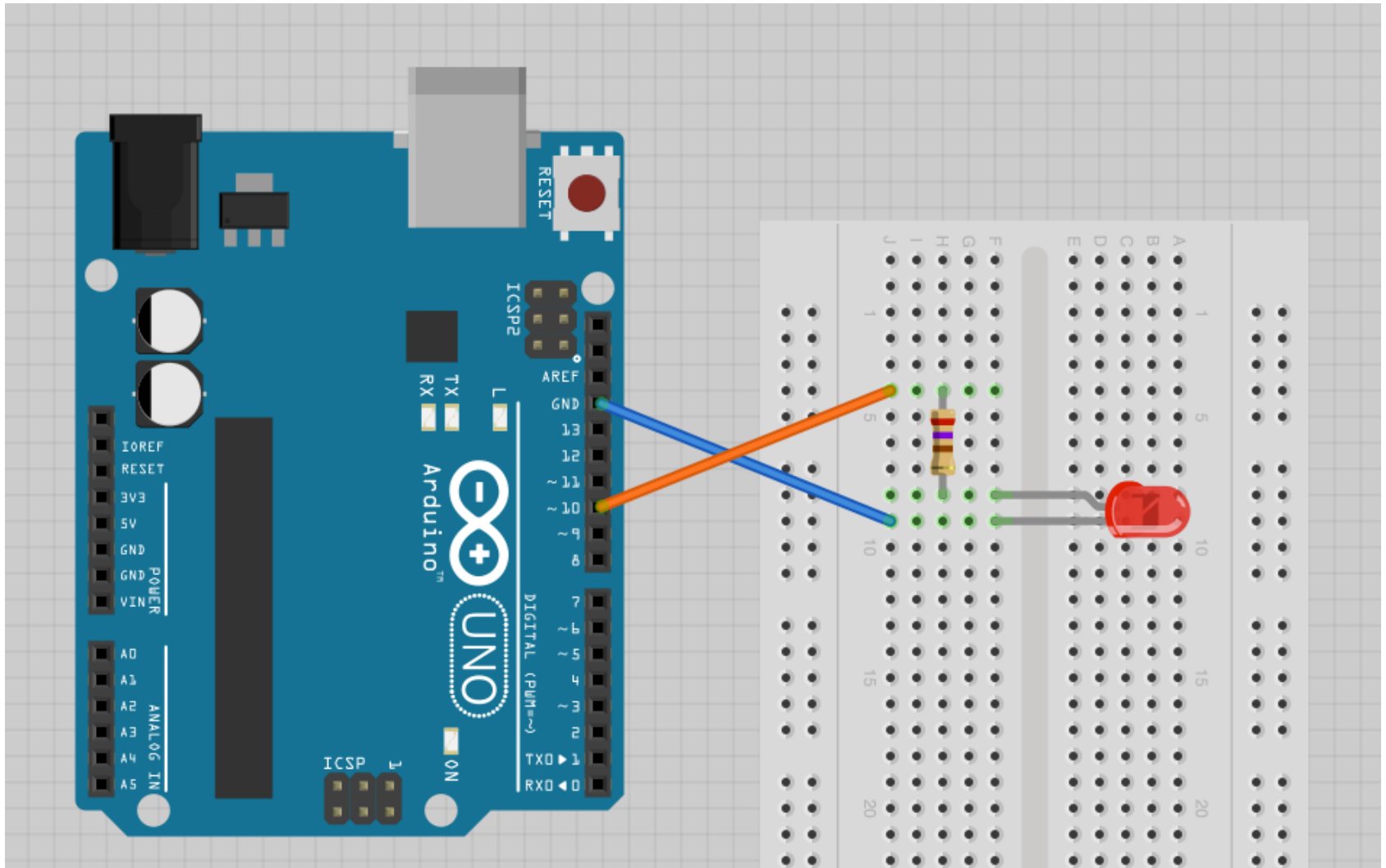
PC installation

```
>pip install pyfirmata
```

Part III. 程式 Demo

- ..pwm control -- light dimming
- ..digital reading -- button switch
 - ..analog reading -- rotary
 - ..servo control

Wiring diagram for PWM control



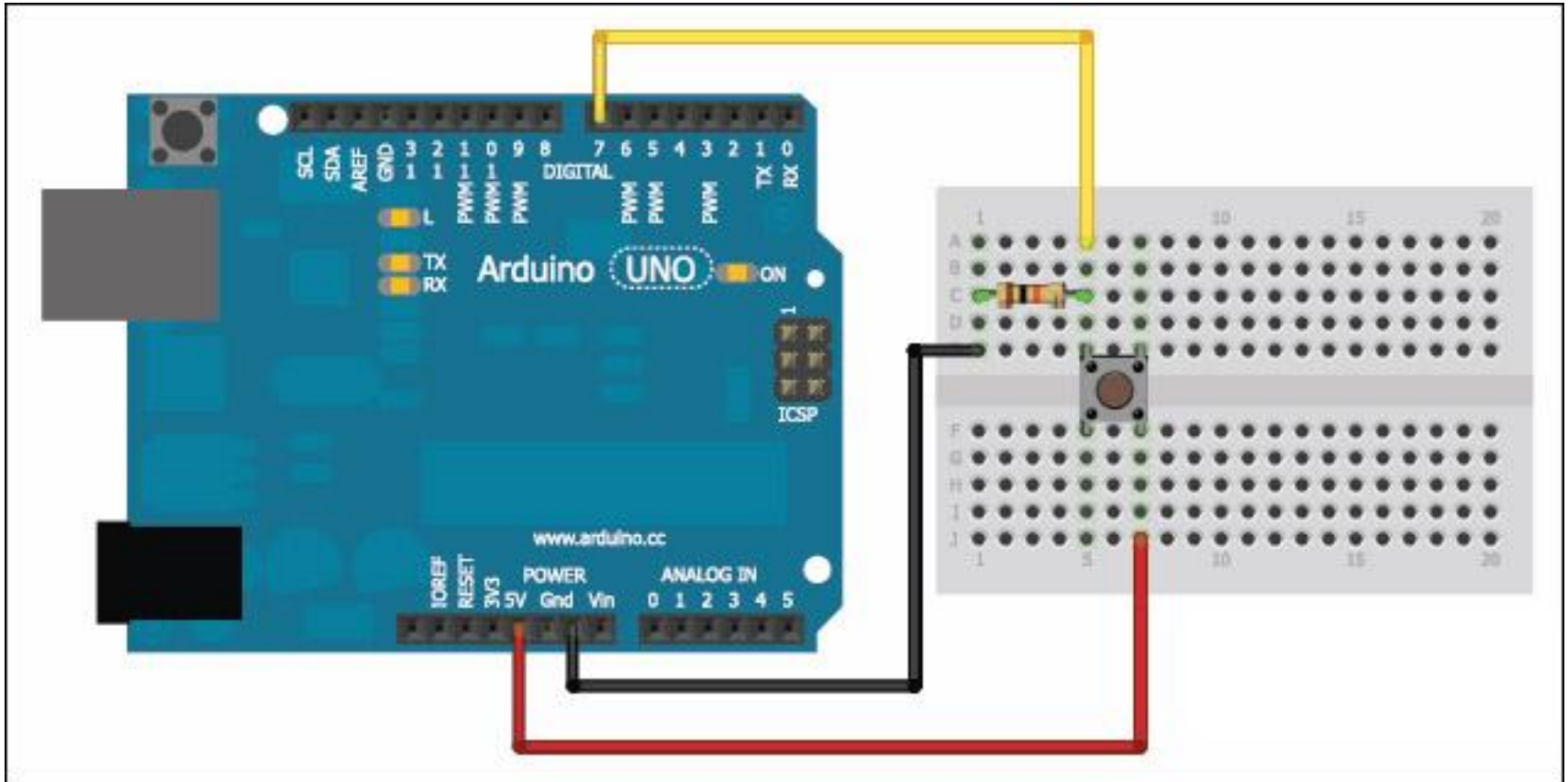
Code for PWM control

```
import pyfirmata
board = pyfirmata.Arduino('/dev/ttyUSB0') #('COM4')

led_pin = board.get_pin('d:3:p') #pin3

while True:
    duty_s = raw_input("Enter Brightness (0 to 100):")
    duty = int(duty_s)
    led_pin.write(duty / 100.0)
```

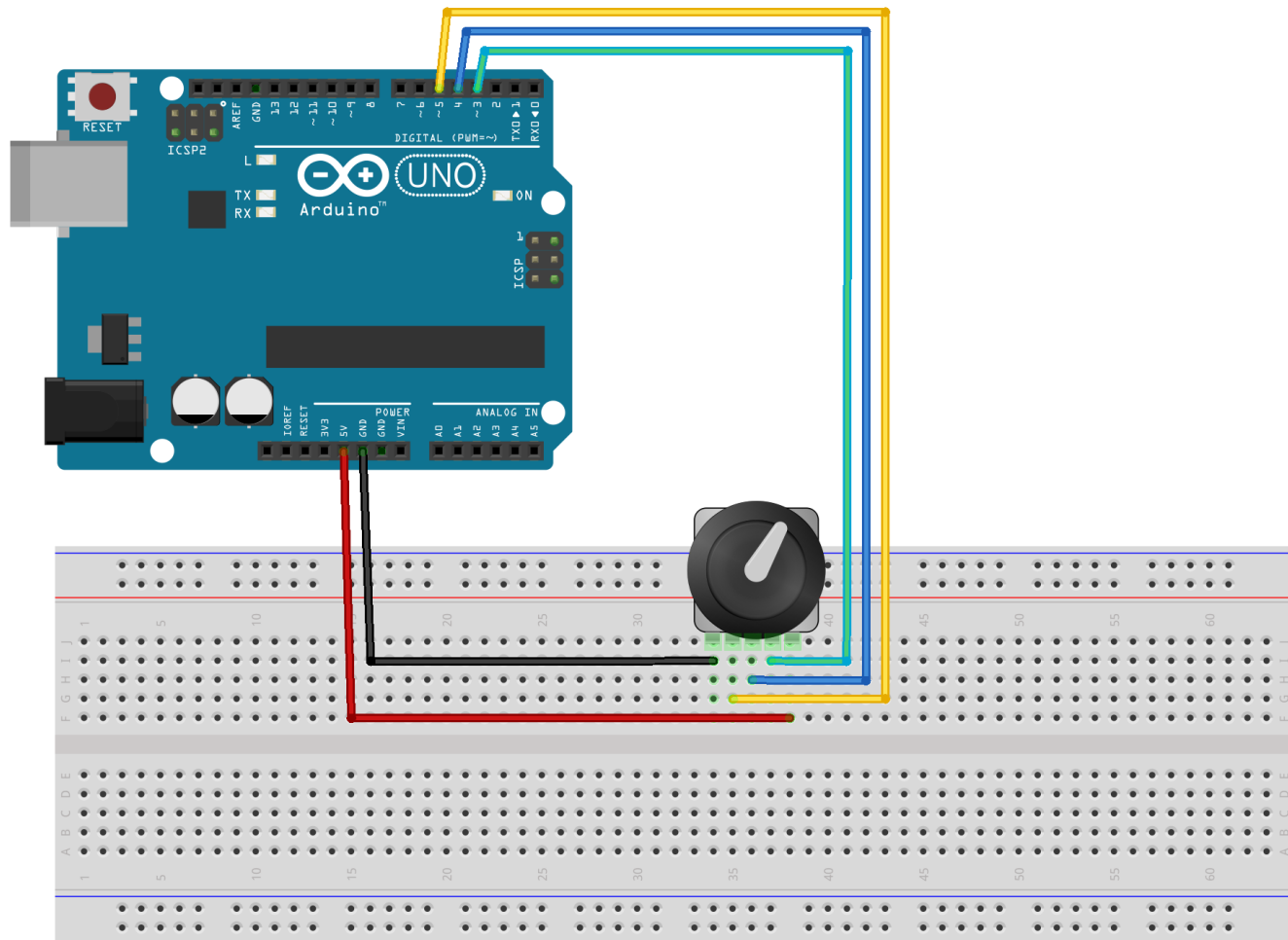
Wiring diagram for Switch



Code for Switch

```
import pyfirmata
import time
board = pyfirmata.Arduino('/dev/ttyUSB0') #('COM4)
switch_pin = board.get_pin('d:4:i')
it = pyfirmata.util.Iterator(board)
it.start()
switch_pin.enable_reporting()
while True:
    input_state = switch_pin.read()
    if input_state == False:
        print('Button Pressed')
        time.sleep(0.2)
```

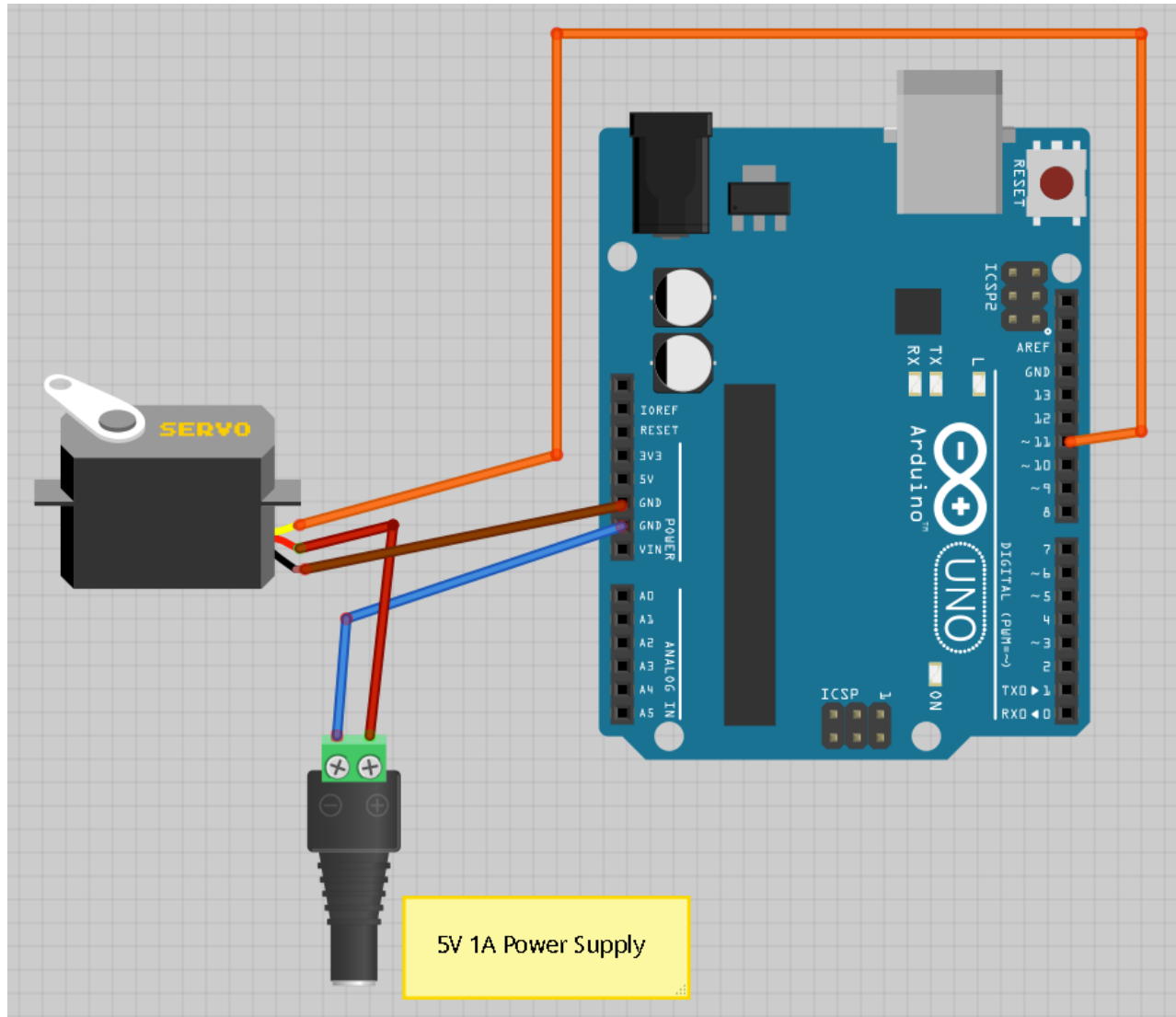
Wiring diagram for Rotary



Code for Rotary

```
import pyfirmata
import time
board = pyfirmata.Arduino('/dev/ttyUSB0') #('COM4')
analog_pin = board.get_pin('a:0:i')
it = pyfirmata.util.Iterator(board)
it.start()
analog_pin.enable_reporting()
while True:
    reading = analog_pin.read()
    if reading != None:
        voltage = reading * 5.0
        print("Reading=%f\tVoltage=%f" % (reading, voltage))
        time.sleep(1)
```


Wiring diagram for servo motor



Code for Servo Motor

```
import pyfirmata

board = pyfirmata.Arduino('/dev/ttyUSB0') #('COM4')

servo_pin = board.get_pin('d:11:s')
while True:
    angle_s = raw_input("Enter Angle (0 to 180):")
    angle = int(angle_s)
    servo_pin.write(angle)
```

Part IV.

..Summary
(Trend of Big Data)

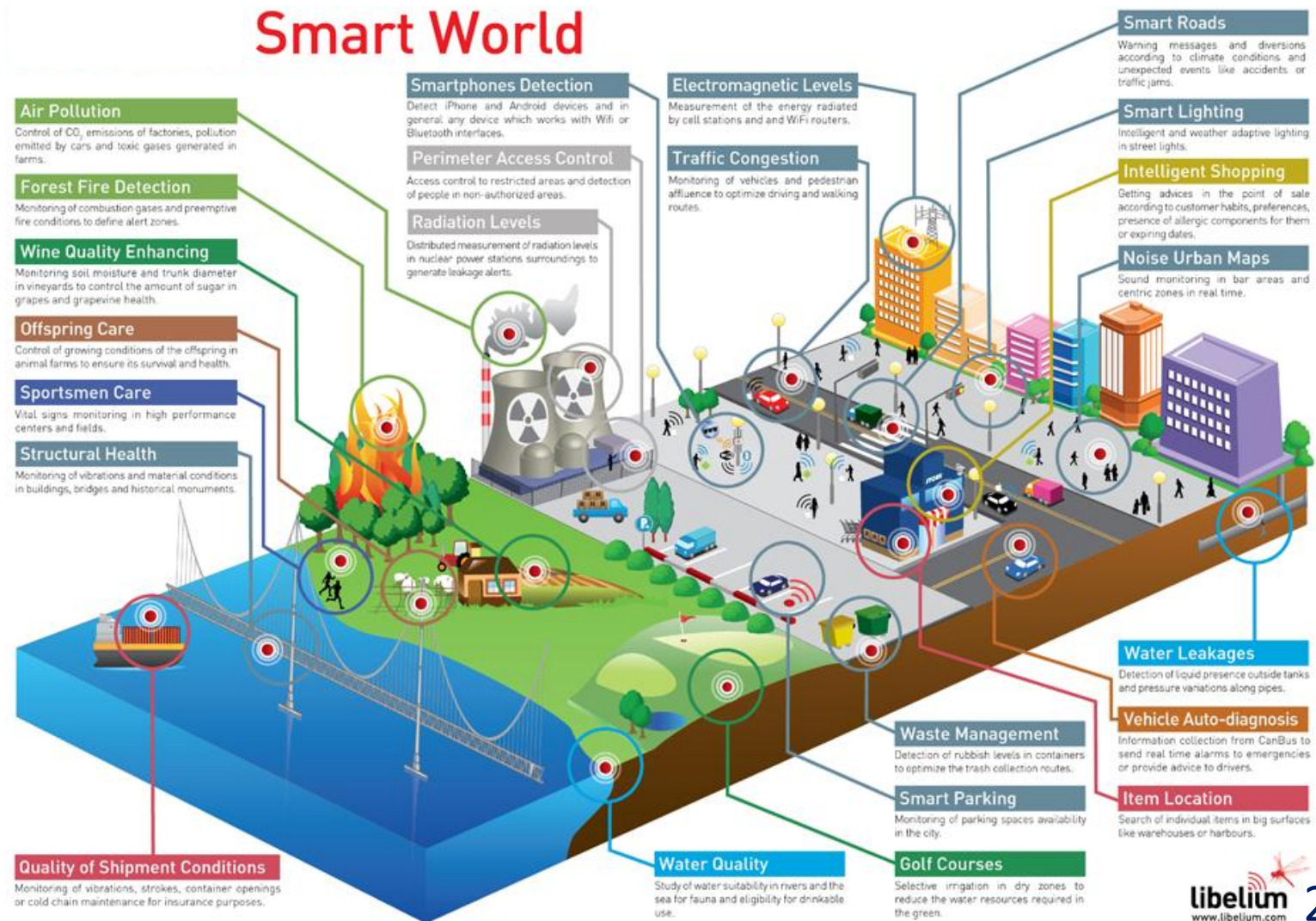
3C – human manipulation



Personal Sensor Networks – M2M

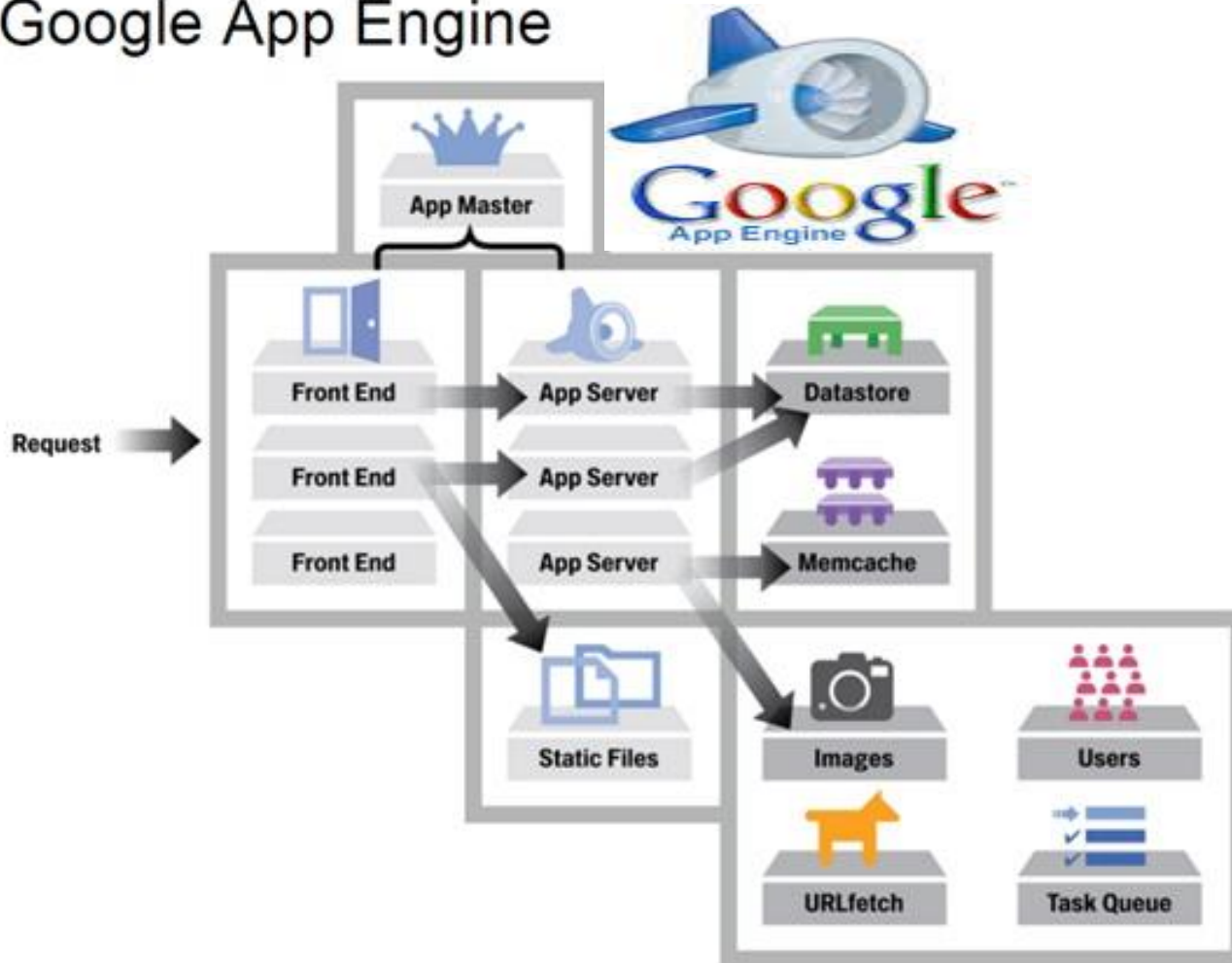


Environmental Sensor Networks – M2M



Google Big Data

Google App Engine



Google @home



Google Glass



Apple

- 智慧家居—s,c,e



Made for

iPhone



Reference

Book information of Raspberry pi cookbook:

[..http://my.safaribooksonline.com/book/hardware/raspberry-pi/](http://my.safaribooksonline.com/book/hardware/raspberry-pi/)

[..http://shop.oreilly.com/product/0636920029595.do](http://shop.oreilly.com/product/0636920029595.do)

[HCI] 談人機介面設計與Usability

[..http://blog.vgod.tw/2009/05/21/usability/?variant=zh-tw](http://blog.vgod.tw/2009/05/21/usability/?variant=zh-tw)

Firmata

http://www.firmata.org/wiki/Main_Page

<http://www.firmata.org/wiki/Download>

git package for Windows

[..http://git-scm.com/](http://git-scm.com/)

Google 將以 32 億美元現金收購 iPod 之父創辦的 Nest Labs

[..http://www.inside.com.tw/2014/01/14/google-is-going-to-acquire-nest-labs-for-3-point-2-billion-in-cash](http://www.inside.com.tw/2014/01/14/google-is-going-to-acquire-nest-labs-for-3-point-2-billion-in-cash)

進一步融入用家不同生活範疇

Apple WWDC 2014 推智能家居平台

[..http://www.hkepc.com/11312](http://www.hkepc.com/11312)

Part V: Q&A