P2

Introduction to Python Programming on the Raspberry Pi

Objectives

- Students will be capable of synchronizing several sensors using a Python Script.
- Students will understand how fast and simple a prototype can be sketched.
- Students will learn why Python is used for fast prototyping and understand why C is used when the time taken to process information matters.

Activity 1. Initial setup

VNC

1. Go to realvnc.com/en/raspberrypi/#sign-up and sign up for a new account
2. On the Raspberry Pi side, open the VNC Server, click the status menu, and select *Licensing*. Enter the credential you created from step one to log in
3. On the controlling computer side, download and install the VNC Viewer application on your computer from https://www.realvnc.com/en/connect/download/viewer/
4. Open VNC Viewer and log in using the credentials you created from step one
5. To open the Raspberry Pi remote desktop, double click the corresponding option on the VNC Viewer and enter the RPi's user and password (by default, the username is `pi` and the password is `raspberry`). After this, you should connect to the remote RPi desktop.

GrovePi+

6. Make sure your Raspberry Pi is connected to the Internet. Power on the Raspberry Pi, without the GrovePi attached, and open a terminal.
7. In the command line, type

```
sudo curl -kL dexterindustries.com/update_grovepi | bash
```

8. After installation is done, restart the Raspberry Pi

```
sudo reboot
```

9. Open a new Terminal window and clone the GrovePi git repository on the Desktop

```
cd /home/pi/Desktop
sudo git clone https://github.com/DexterInd/GrovePi
```

When we're done downloading, there should be a new folder on the Desktop called "GrovePi". This means you are done installing the repository.

Activity 2. GrovePi+ Testing

10. To test the Grove Pi, connect a Grove LED to port D4 and run the LED blinking example.
11. In the Terminal type

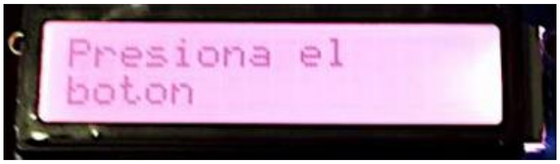
```
cd /home/pi/Desktop/GrovePi/Software/Python

sudo python grove_led_blink.py
```

12. Verify the LED is correctly blinking on the GrovePi+ board

Activity 3. Python Scripting

13. For this activity, read and run the next examples:
    - `GrovePi/Software/Python/grove_rgb_lcd/example.py`
    - `GrovePi/Projects/Button_And_Buzzer/Button_And_Buzzer.py`
    - `GrovePi/Software/Python/grove_temperature_sensor.py`
14. After this, write a Python script that meets the following requirements
    - While the button is NOT pressed, the "Grove RGB LCD" must show
        - Text: `Presiona el boton`
        - Background Color: red



    - While the button IS pressed, the "Grove RGB LCD" must show
        - Text: `Temp = XX C`, where XX is the room temperature in °C
        - Background Color: green

Report

Turn in a PDF containing the following:

- Header (Laboratory Name and team members' names and ID numbers)
- Activities
    - Evidence of Activity 1
    - Evidence of Activity 2
    - Evidence and link to GitHub repository for Activity 3
- Conclusions

Reference

"Setting Up The Software - Dexter Industries." Dexter Industries. N.p., n.d. Web. 26 Jan. 2016.
http://www.dexterindustries.com/GrovePi/get-started-with-thegrovepi/setting-software/