IoT with MIT App Inventor

Fundamental

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Physical Computing with Python in Raspberry Pi

- Check Python version
- Use Python interactively from Command Prompt
- Create Python File in Command Mode
- Create Python File in GUI mode - Thonny

Python Basics

- Comments, literal constants, numbers, quotes.
- Operators and Expressions
- Control Flows
- Functions
- Modules

GPIO control in python on Raspberry Pi

- Install the GPIO library

  $ sudo apt-get update

  $ sudo apt-get install python-dev

  $ sodu apt-get install python3-dev

  $ sudo apt-get install python-rip.gpio

- Refer to Pin numbering

  GPIO.setmode(GPIO.BOARD)

  GPIO.setmode(GPIO.BCM)

- Channel (I/O port pin) configuration

  GPIO.setup(channel, GPIO.IN)

  GPIO.setup(channel, GPIO.OUT), GPIO.setup(channel, value), GPIO.cleanup()

GPIO control in python on Raspberry Pi

```
import RPi.GPIO as GPIO    #import GPIO library
import time
GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)
GPIO.setup(2, GPIO.OUT)


try:
    while True:
        GPIO.output(2, 1)     #turn on the LED
        time.sleep(1)         #wait for 1 sec
        GPIO.output(2, 0)     #turn off the LED
        time.sleep(1)         #wait for 1 sec
except KeyboardInterrupt:
    GPIO.cleanup()
```

Python Program - LED control through bluetooth

$ sudo apt-get install bluetooth libbluetooth-dev

$ sudo python3 -m pip install pybluez

$ sudo nano /etc/systemd/system/dbus-org.bluez.service

ExecStart = /usr/lib/bluetooth/bluetoothd -C

ExecStartPost = /usr/bin/sdptool add SP

$ sudo reboot

Python Program - LED control through bluetooth

$ hciconfig | grep “BD Address”

MAC address: A media access control address (MAC address) is a unique identifier assigned to a network interface controller (NIC) for use as a network address in communications within a network segment. This use is common in most IEEE 802 networking technologies, including Ethernet, Wi-Fi, and Bluetooth.

GPIO control in python on Raspberry Pi

Home project - Develop python program to simulate traffic lights.

Hint: Use three GPIO pins as input and modify the Python program learned from class to simulate traffic lights.