虚谷号WebGPIO应用（服务器端）

虚谷号和手机（App inventor）如何互动控制?

虚谷号和掌控板如何互动控制?

为了让虚谷号和其他开源硬件、编程语言快速互动，虚谷号的WebGPIO应运而生。简单的说，只要在虚谷号上运行一个python文件，就可以用WebAPI的形式来与虚谷号互动，可以获取虚谷号板载Arduino的所有引脚的电平，也可以控制所有引脚。

运行服务器端代码

要在虚谷号上运行下面的代码。也可以将“webgpio.py”文件更名为“main.py”，复制到vvBoard的Python目录，只要一开机，虚谷号就会执行。

注意：

- 如果在jupyter上运行代码，重新启动时要在“服务”中选择“重启 & 清空输出”，再运行。
- 看到“Running on ……”的标识出现，说明服务启动正常。

In [*]:

```
#!/usr/bin/env python3
# -*- coding: utf-8 -*-
"""
@Description: WebGPIO For vvBoard
@author: xiezuoru,james,yyp
@version: 1.1
@Date:2020.2.21
@Link: https://github.com/vvlink/vvBoard-app/tree/master/webgpio
"""

import threading
from flask import Flask
from flask import request
import time
import json
import socket

app = Flask(__name__)
ret = None
value = None
pin = None
types = None

pin_D_list=['D2','D3','D4','D5','D6','D7','D8','D9','D10','D11','D12','D13']
pin_A_list=['A0','A1','A2','A3','A4','A5']
type_D_list=['digital','d','1']
type_A_list=['analog','a','2']
type_S_list=['servo','s','3']

@app.route('/',methods=["POST","GET"])
def web_gpio():
    if (request.method == 'GET'):
        return web_gpio_get(request)
    elif (request.method == 'POST'):
        return web_gpio_post(request)

def web_gpio_get(request):
    global ret,pin
    pin=request.values.get('pin')
    if not(pin):
        try:
            pin=request.json.get('pin')
        except Exception:
            data = {"pin":666,"error_code":0, "msg":re_html}
            return jsondumps(data)
    pin=str.upper(pin)
    print("pin = ",pin)
    if not (pin in pin_D_list or pin in pin_A_list):
        data = {"pin":pin,"error_code":1, "msg":"error,invalid Pin"}
        return jsondumps(data)

    if pin in pin_D_list:
        ret = 0
        time.sleep(0.5)
        data = {"pin":pin,"error_code":0,"msg":str(value)}
        return jsondumps(data)
    if pin in pin_A_list:
        ret = 1
        time.sleep(0.5)
```

```
        data = {"pin":pin,"error_code":0,"msg":str(value)}
        return jsondumps(data)

def web_gpio_post(request):
    global types,pin,value
    pin=request.values.get('pin')
    types=request.values.get("type")
    value=request.values.get("value")
    if not(pin):
        try:
            pin=request.json.get('pin')
            types=request.json.get('type')
            value=request.json.get('value')
        except Exception:
            data = {"pin":666,"error_code":0, "msg":re_html}
            return jsondumps(data)
    if not(pin) or not(types) or not(value) :
        data = {"pin":pin,"error_code":1,"msg":"缺少必要参数"}
        return jsondumps(data)
    pin=str.upper(str(pin))
    types=str.lower(str(types))
    if not (pin in pin_D_list or pin in pin_A_list):
        data = {"pin":pin,"error_code":1,"msg":"error,invalid Pin"}
        return jsondumps(data)
    try:
        value=int(value)
    except Exception:
        data = {"pin":pin,"error_code":1,"msg":"error,Value is wrong"}
        return jsondumps(data)
    if not (types in type_D_list or types in type_A_list or types in type_S_list):
        data = {"pin":pin,"error_code":1,"msg":"error,Type is wrong"}
        return jsondumps(data)
    data = {"pin":pin,"error_code":0,"msg":"success,set "+pin+" to "+str(value)+" wi
    return jsondumps(data)

@app.route('/help/',methods=["POST","GET"])
def gpiohelp():
    helphtml='''<html><head><meta http-equiv="Content-Type" content="text/html; char
            <title>WebGPIO for vvboard</title>
            <style>.c{font-size:12px;}</style></head>
          <body class="c"><div class="c"><b>远程感知 -->> </b></div>
        <form action="/" method="get" enctype="application/x-www-form-urlencoded" ta
            <label for="tag" class="c">引脚</label><input type="text" name="pin" val
            <input type="submit" value=" 发送读取命令 " class="c">
        </form>
        <div class="c"><b>远程控制 -->> </b></div>
        <form action="/" method="post" enctype="application/x-www-form-urlencoded" t
            <label for="pin" class="c">引脚编号</label><input type="text" name="pin"
            <label for="type" class="c">控制类型</label><input type="text" name="type
            <label for="value" class="c">设置数值</label><input type="text" name="val
            <input type="submit" value=" 发送控制命令 " class="c">
        </form>
        <div class="c"><a href="https://github.com/vvlink/vvBoard-app/tree/master/we
        <div class="c"><b>反馈显示 -->> </b></div>
        <div class="c">
            <iframe name="result" frameborder="0" scrolling="no" class="c" src=""></
        </div></body></html>'''
    return helphtml

def xugu():
    global value,ret,types
```

```
    while True:
        if ret == 0:
            xugu_pin=Pin(pin,Pin.IN)
            value=xugu_pin.read_digital()
            ret=None
        if ret == 1:
            xugu_pin=Pin(pin,Pin.ANALOG)
            value=xugu_pin.read_analog()
            ret=None
        if types in type_D_list:
            xugu_pin=Pin(pin,Pin.OUT)
            if value == 0:
                xugu_pin.write_digital(value)
            else:
                value = 1
                xugu_pin.write_digital(value)
            types=None
        if types in type_A_list:
            xugu_pin=Pin(pin,Pin.OUT)
            xugu_pin.write_analog(value)
            types=None
        if types in type_S_list:
            xugu_servo=Servo(pin)
            xugu_servo.write_angle(value)
            types=None


def jsondumps(data):
    return json.dumps(data,indent=4,ensure_ascii=False,sort_keys=True)
def get_host_ip():
    try:
        s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
        s.connect(('8.8.8.8', 80))
        ip = s.getsockname()[0]
    finally:
        s.close()
    return ip

def run():
    app.run(host=ip,port=1024,debug=False)

ip=get_host_ip()
re_html='访问“http://'+ip +':1024/help/”得到更多帮助'
t=threading.Thread(target=run)
t.start()

#启动gpio的服务监视
from xugu import Pin
from xugu import Servo
xugu()
```

```
pymata_aio Version 2.28 Copyright (c) 2015-2018 Alan Yorinks All righ
ts reserved.

Using COM Port:/dev/ttyS1

Initializing Arduino - Please wait...
Arduino Firmware ID: 2.5 StandardFirmata.ino
Auto-discovery complete. Found 20 Digital Pins and 6 Analog Pins
```

```
192.168.3.14 - - [28/Feb/2020 17:33:50] "GET /help/ HTTP/1.1" 200 -
pin =  A0
192.168.3.14 - - [28/Feb/2020 17:33:53] "GET /?pin=A0 HTTP/1.1" 200 -
pin =  D4
192.168.3.14 - - [28/Feb/2020 17:34:01] "GET /?pin=d4 HTTP/1.1" 200 -
pin =  A2
```

接下来就开始自由控制虚谷号吧。访问网址下面的“help”目录可以得到帮助。如http://192.168.3.42:1024/help/ (http://192.168.3.42:1024/help/)

In [ ]: