“Raspberry pi course”

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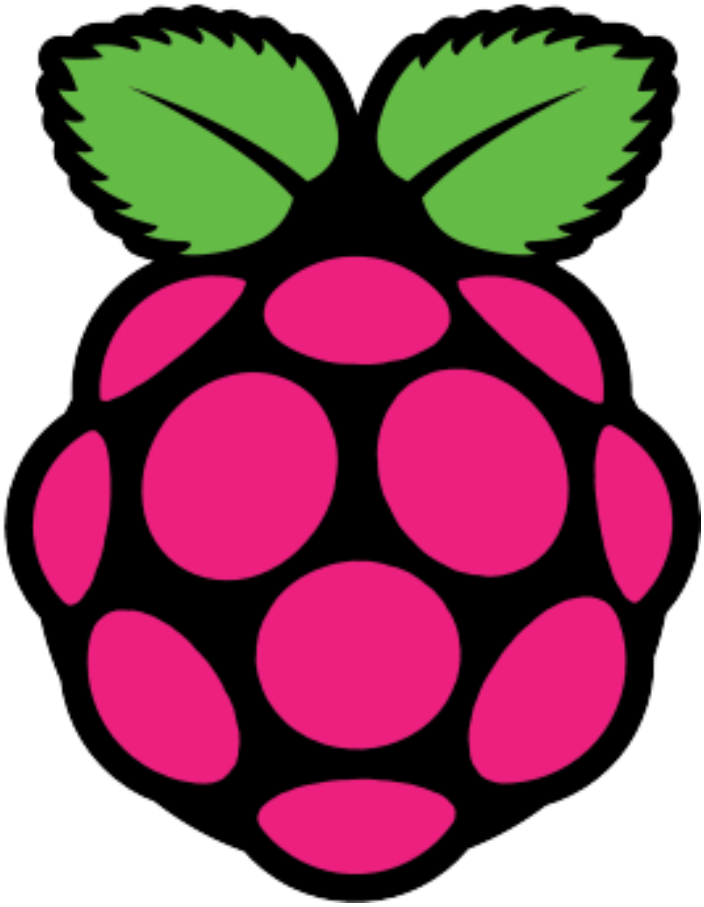

SESSION NO.“8”

- 16*2 I2C LCD
- CLOUD
- UPIDOTS

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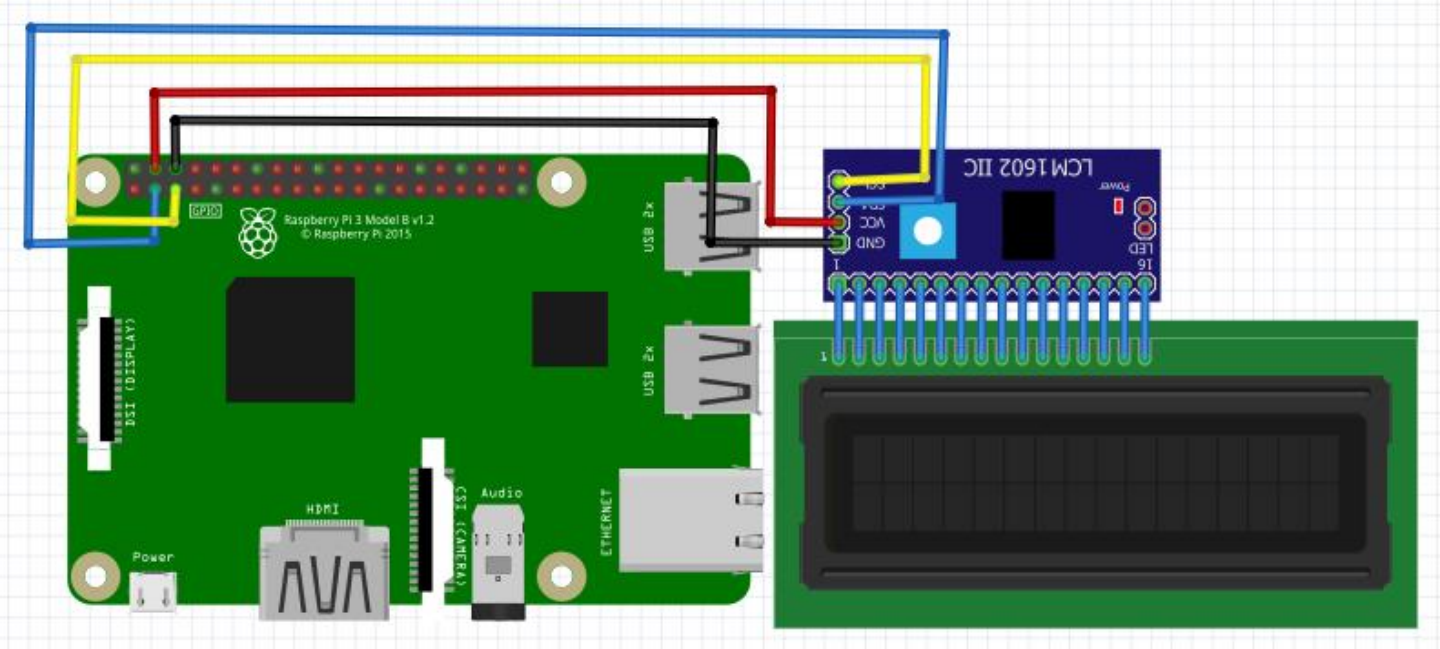
16*2 I2C LCD



EXAMPLE CODE :

```
import smbus

import time

# Define some device parameters

I2C_ADDR  = 0x27 # I2C device address

LCD_WIDTH = 16   # Maximum characters per line

# Define some device constants

LCD_CHR = 1 # Mode - Sending data

LCD_CMD = 0 # Mode - Sending command

LCD_LINE_1 = 0x80 # LCD RAM address for the 1st line

LCD_LINE_2 = 0xC0 # LCD RAM address for the 2nd line

LCD_LINE_3 = 0x94 # LCD RAM address for the 3rd line

LCD_LINE_4 = 0xD4 # LCD RAM address for the 4th line

LCD_BACKLIGHT  = 0x08  # On

#LCD_BACKLIGHT = 0x00  # Off

ENABLE = 0b00000100 # Enable bit
```

```
# Timing constants
E_PULSE = 0.0005
E_DELAY = 0.0005
#Open I2C interface
#bus = smbus.SMBus(0)  # Rev 1 Pi uses 0
bus = smbus.SMBus(1) # Rev 2 Pi uses 1
def lcd_init():
# Initialise display
lcd_byte(0x33,LCD_CMD) # 110011 Initialise
lcd_byte(0x32,LCD_CMD) # 110010 Initialise
lcd_byte(0x06,LCD_CMD) # 000110 Cursor move direction
lcd_byte(0x0C,LCD_CMD) # 001100 Display On,Cursor Off, Blink Off
lcd_byte(0x28,LCD_CMD) # 101000 Data length, number of lines, font size
lcd_byte(0x01,LCD_CMD) # 000001 Clear display
time.sleep(E_DELAY)
def lcd_byte(bits, mode):
# Send byte to data pins
# bits = the data
# mode = 1 for data
#        0 for command
bits_high = mode | (bits & 0xF0) | LCD_BACKLIGHT
bits_low = mode | ((bits<<4) & 0xF0) | LCD_BACKLIGHT
# High bits
bus.write_byte(I2C_ADDR, bits_high)
lcd_toggle_enable(bits_high)
# Low bits
bus.write_byte(I2C_ADDR, bits_low)
lcd_toggle_enable(bits_low)
def lcd_toggle_enable(bits):
# Toggle enable
time.sleep(E_DELAY)
bus.write_byte(I2C_ADDR, (bits | ENABLE))
```

```
time.sleep(E_PULSE)
bus.write_byte(I2C_ADDR,(bits & ~ENABLE))
time.sleep(E_DELAY)
def lcd_string(message,line):
# Send string to display
message = message.ljust(LCD_WIDTH," ")
lcd_byte(line, LCD_CMD)
for i in range(LCD_WIDTH):
lcd_byte(ord(message[i]),LCD_CHR)
def main():
# Main program block
# Initialise display
lcd_init()
while True:
# Send some test
lcd_string("AHMED",LCD_LINE_1)
lcd_string("MUBARAK",LCD_LINE_2)
time.sleep(4)
# Send some more text
lcd_string("Raspberry Pi",LCD_LINE_1)
lcd_string("Tutorial",LCD_LINE_2)
time.sleep(3)
# Clear lcd
lcd_string("",LCD_LINE_1)
lcd_string("",LCD_LINE_2)
time.sleep(4)
if __name__ == '__main__':

try:
main()
except KeyboardInterrupt:
pass
```

finally:

lcd_byte(0x01, LCD_CMD)

CLOUD

"I WILL SEND AN EMAIL TO MYSELF"

- **USING " https://ifttt.com/ " .**
- **MAKE AN ACCOUNT ON "IFTTT".**
- **CLICK " CREATE ".**
- **CLICK " IF THIS ".**
- **SEARCH FOR " WEBHOOKS " AND CHOOSE IT.**
- **CHOOSE RECEIVE A WEB REQUEST.**
- **NAME THE EVENT EMAIL AND CLICK " CREATE TRIGGER ".**
- **CLICK " THEN THAT ".**
- **SEARCH FOR " GMAIL " AND CHOOSE IT.**
- **CHOOSE SEND YOURSELF AN EMAIL.**
- **TYPE THE SUBJECT AN THE BODY OF THE EMAIL AND CLICK " CREATE ACTION ".**
- **CLICK CONTINUE AND CLICK FINISH.**
- **NOW, GO TO " MY SERVICES " AND CHOOSE " WEB HOOKS " THEN CLICK ON DOCUMENTATION TO GET THE LINK OF THE EVENT.**
- **NOW, GO TO RASPBERRY PI TO FIRE THE EVENT .**

- **1.** As we may need to install some additional packages, let's start by ensuring our Raspberry Pi is running the latest available software.
- You can do this by running the following two commands.

```
sudo apt update
```

```
sudo apt upgrade
```

- **2.** With the packages up to date, we can now make sure Python 3 and some of its dependencies are installed.
- We will be using Python to interact with our IFTTT webhook.
- To ensure Python is installed, run the following command.

```
sudo apt install python3 python3-pip
```

- **3.** Now with Python 3 installed, let's ensure that we have access to the Python Requests library.
- Run the following command to use `pip` to install the requests module.

```
sudo pip3 install requests
```

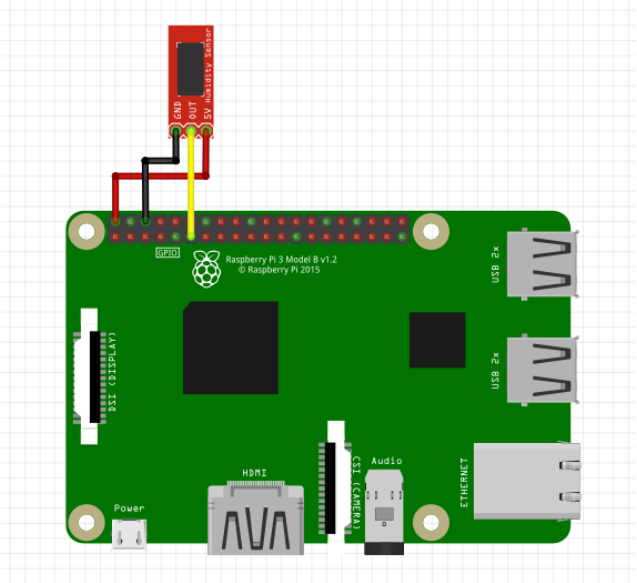
- You can now proceed to write a Python script that will interact with your IFFTT webhook from your Raspberry Pi.

Interacting with IFTTT from your Raspberry Pi

- **1.** Let's begin the process of writing our Python script by using the following command.
- This first script will show you the very basics of how to use an IFTTT webhook.
- `nano ~/ifttt.py`
- **2.** We should start this script by importing the `requests` library.
- `import requests`
- **3.** Our next step is to make a post request to the webhook URL provided by IFTTT.
- To make a request there are two things you will need to know.
- The first is the **event name** that you defined for your webhook. In our example, we used the event name "**motion_detected**".
- The second thing you will need is the webhook API key. You should have found this earlier on in the guide when setting up your IFTTT action.
- With both of these values in hand, we need to enter the following line. Make sure to replace both "**{EVENT_NAME}**" and "**{YOURAPIKEY}**" with the relevant pieces of information.
- `requests.post('https://maker.ifttt.com/trigger/{EVENT_NAME}/with/key/{YOURAPIKEY}')`
- **4.** That is all we need to do to do to make a webhook request in Python.
- Save the file by pressing `CTRL` + `X`, then `Y`, followed by `ENTER`.
- **5.** Before we test this script, make sure that you have the IFTTT app installed onyour phone.
- You can install the IFTTT app through the Google Play Store for Android or the App Store for iPhones.
- Without this app, you will never receive the notification.
- **6.** Once you have the IFTTT app installed, test the script by running the command below.
- `python3 ~/ifttt.py`
- If everything is working correctly, you should see a notification pop up on your device.

UPIDOTS

SHOW TEMP AND HUMIDITY ON UPIDOTS




```
import time

import requests

import math

import random

import sys

import Adafruit_DHT

import time

TOKEN = "..."  # Put your TOKEN here

DEVICE_LABEL = "machine"  # Put your device label here

VARIABLE_LABEL_1 = "temperature"  # Put your first variable label here

VARIABLE_LABEL_2 = "humidity"  # Put your second variable label here

def build_payload(variable_1, variable_2):

# Creates two random values for sending data

humidity, temperature = Adafruit_DHT.read_retry(11, 14)

# Creates a random gps coordinates

lat = random.randrange(34, 36, 1) + \

random.randrange(1, 1000, 1) / 1000.0

lng = random.randrange(-83, -87, -1) + \

random.randrange(1, 1000, 1) / 1000.0

payload = {variable_1: temperature,
```

```
variable_2: humidity}
return payload
def post_request(payload):
# Creates the headers for the HTTP requests
url = "http://industrial.api.ubidots.com"
url = "{}/api/v1.6/devices/{}".format(url, DEVICE_LABEL)
headers = {"X-Auth-Token": TOKEN, "Content-Type": "application/json"}
# Makes the HTTP requests
status = 400
attempts = 0
while status >= 400 and attempts <= 5:
req = requests.post(url=url, headers=headers, json=payload)
status = req.status_code
attempts += 1
time.sleep(1)
# Processes results
if status >= 400:
print("[ERROR] Could not send data after 5 attempts, please check \
your token credentials and internet connection")
return False
print("[INFO] request made properly, your device is updated")
return True
def main():
payload = build_payload(
VARIABLE_LABEL_1, VARIABLE_LABEL_2)
print("[INFO] Attemping to send data")
post_request(payload)
print("[INFO] finished")
if __name__ == '__main__':
while (True):
main()
time.sleep(1)
```

With my best wishes:

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