

INTERNET OF THINGS – IT134IU

LAB 4 and Lab 4 Extra

Instructions: Please follow the steps:

- 1 – Students work in groups. Please answer the questions clearly. Remember to include your name and your student ID.
- 2 - Each group leader (ONLY the group leader, please!) submits the report in Pdf format before the deadline.

| Group Name: | | | |
|-------------|------------|-----------------------|---------------------------|
| No | ID | Name | No Contribution (0 point) |
| 1 | ITITI21045 | Nguyễn Minh Đức | 16% |
| 2 | ITITI21123 | Trần Hoàng Thế Bảo | 16% |
| 3 | ITITI21217 | Đỗ Đức Huy | 16% |
| 4 | ITITI21076 | Bùi Đức Mạnh | 16% |
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LAB 4 and LAB 4 EXTRA

1. Activity 2

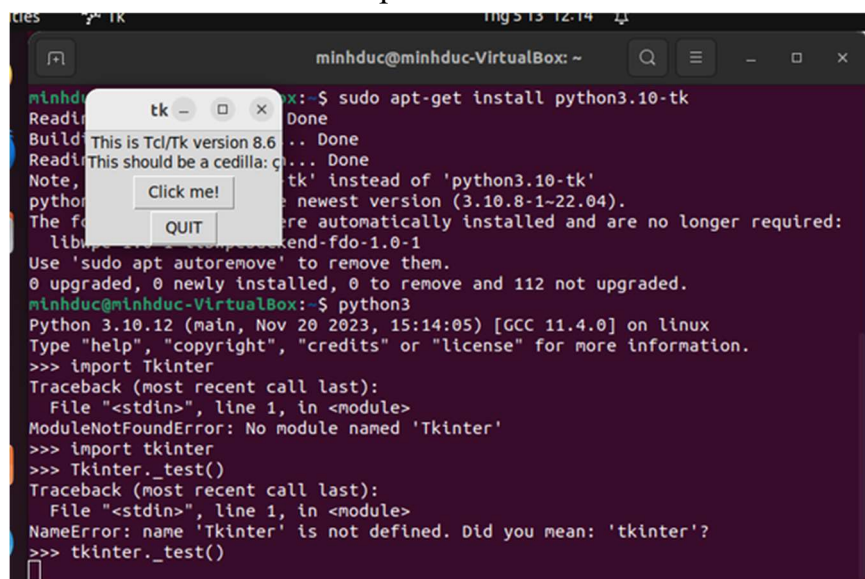
a) Take the result screenshot photos.

b) Answer all the questions

```
import pyfirmata # import lib of py#rmata
import time as wait # import lib of py#rmata
board = pyfirmata.Arduino('/dev/ttyACM0')# de#ne COM port of Arduino
red_pin = board.get_pin('d:7:o')# assign digital pin 7 as an output
green_pin = board.get_pin('d:6:o')# assign digital pin 6 as an output
while True: # in#nite loop
    red_pin.write(1)# write '1' on pin 7
    green_pin.write(1)# write '1' on pin 6
    wait.sleep(0.5)# delay of 0.5 Sec
    red_pin.write(0)#write '0' on pin 7
    green_pin.write(0)# write '0' on pin 6
    wait.sleep(0.5)# delay of 0.5 Sec
```

2. Activity 3

a) Take the result screenshot photos



```
minhduc@minhduc-VirtualBox: ~$ sudo apt-get install python3.10-tk
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, 'tk' instead of 'python3.10-tk'
python3.10-tk is the newest version (3.10.8-1~22.04).
The following packages were automatically installed and are no longer required:
  libpython3.10-stdlib python3.10-venv python3.10-wheel python3.10-yaml
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 112 not upgraded.
minhduc@minhduc-VirtualBox: ~$ python3
Python 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import Tkinter
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
ModuleNotFoundError: No module named 'Tkinter'
>>> import tkinter
>>> Tkinter._test()
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
NameError: name 'Tkinter' is not defined. Did you mean: 'tkinter'?
>>> tkinter._test()
```

b) Answer all the questions

```
import tkinter
import pyfirmata
import time as wait
# Associate port and board with py"rmata
board = pyfirmata.Arduino('/dev/ttyACM0')
wait.sleep(5) # delay of 5Sec
```

```

led_Pin = board.get_pin('d:7:o') # connect led to pin 7 and used as output
def call_LED_BLINK():
    button.config(state = tkinter.DISABLED)
    led_Pin.write(1) # make led_Pin to HIGH
    print('LED at pin7 is ON') # print on terminal
    wait.sleep(5) # delay of 5 sec
    print('LED at pin 7 is OFF') # print on terminal
    led_Pin.write(0) # make led_Pin to LOW
    button.config(state=tkinter.ACTIVE)
# Initialize main windows with title and size
TOP = tkinter.Tk()
TOP.title("Blink LED using button")
TOP.minsize(300,30)
# Create a button on main window and associate it with above method
button = tkinter.Button(TOP, text="Press start to blink", command =
call_LED_BLINK)
button.pack()
TOP.mainloop()

```

Control led brightness:

```

import tkinter # add Tkinter library
import pyfirmata # add pyfirmata library
import time as wait # add time library
board = pyfirmata.Arduino('/dev/ttyACM0')
wait.sleep(5) # delay of 5 Sec
led_Pin = board.get_pin('d:6:p') # connect led to pin 7 and used as output
def call_led_blink_pwm():
    time_Period = time_Period_Entry.get()
    time_Period = float(time_Period) led_Brightness =
brightness_Scale.get()
    led_Brightness = float(led_Brightness / 100.0)
    print(led_Brightness)
    button.config(state=tkinter.DISABLED)
    led_Pin.write(led_Brightness)
    print ('LED brightness control') # print on terminal
    wait.sleep(time_Period)
    led_Pin.write(0) # make led_Pin to LOW
    button.config(state=tkinter.ACTIVE)

```

```

TOP = tkinter.Tk()
time_Period_Entry = tkinter.Entry(TOP, bd=7, width = 30 )
time_Period_Entry.pack()time_Period_Entry.focus_set()
brightness_Scale = tkinter.Scale(TOP, from_=0, to=100,
orient=tkinter.VERTICAL)
brightness_Scale.pack()
button = tkinter.Button(TOP, text="Start", command = call_led_blink_pwm)
button.pack()
TOP.mainloop()

```

Link to video of activity 2 and activity 3:

<https://drive.google.com/drive/folders/1aPQQJVIRZLKLE5PBTYC6S2q7MOnnwqhn?usp=sharing>

3. Lab 4 Extra

```

import http.client
import urllib.parse
import time

key = "JCQN08TPWH80CNML" # Put your API Key here

def thermometer():
    # Calculate CPU temperature of Raspberry Pi in Degrees C
    temp = int(open('/sys/class/thermal/thermal_zone0/temp').read()) / 1e3 # Get
    Raspberry Pi CPU temp
    params = urllib.parse.urlencode({'field1': temp, 'key': key})
    headers = {"Content-Type": "application/x-www-form-urlencoded", "Accept":
"text/plain"}
    conn = http.client.HTTPConnection("api.thingspeak.com:80")
    try:
        conn.request("POST", "/update", params, headers)
        response = conn.getresponse()
        print(temp)
        print(response.status, response.reason)
        data = response.read()
        conn.close()
    except Exception as e:
        print("Connection failed:", e)

while True:
    thermometer()
    time.sleep(15) # Adjust the sleep time according to your requirements

```

```
admin@raspberrypi:~ $ nano cpu.py
admin@raspberrypi:~ $ python2
bash: python2: command not found
admin@raspberrypi:~ $ python3
Python 3.9.2 (default, Mar 12 2021, 04:06:34)
[GCC 10.2.1 20210110] on linux
Type "help", "copyright", "credits" or "license" for more
>>> exit()
admin@raspberrypi:~ $ python3 cpu.py
Traceback (most recent call last):
  File "/home/admin/cpu.py", line 23, in <module>
    if __name__ == "__main__":
NameError: name '__name__' is not defined
admin@raspberrypi:~ $ nano cpu.py
admin@raspberrypi:~ $ python3 cpu.py
64.757
200 OK
63.296
200 OK
63.783
200 OK
```

Channel Stats

Created: [about 4 hours ago](#)
Last entry: [about 2 hours ago](#)
Entries: 4

