

Code for Practical 4



The screenshot shows a Windows PowerShell terminal window with the following content:

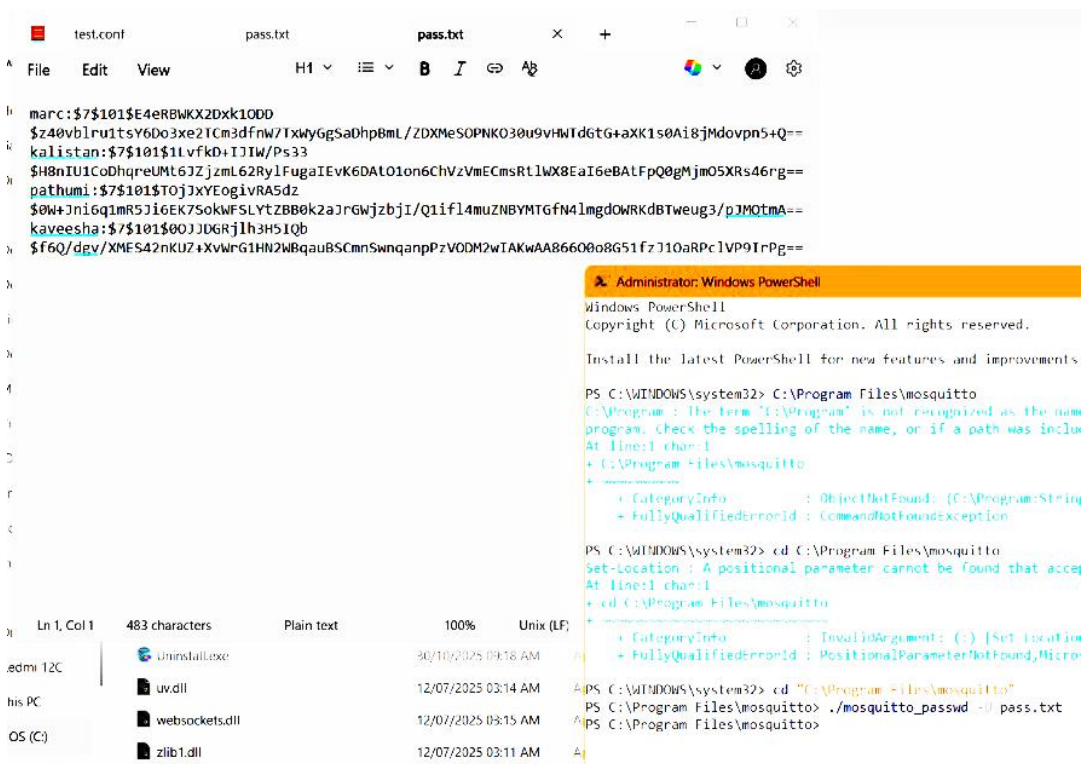
```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Program Files\mosquitto> ./mosquitto_sub -h localhost -t topic/test
PS C:\Program Files\mosquitto> ./mosquitto_sub -h localhost -t topic/test
PS C:\Program Files\mosquitto> ./Mosquitto_sub -h localhost -t topic/test
Hello I am publisher from cmd
Chickens
```

Below the terminal window, there is a file explorer view showing the contents of the 'C:\Program Files\mosquitto' directory. It lists several files and folders, including 'OneDrive - Gen...', 'Redmi 12C', 'This PC', 'OS (C)', and 'Google Drive'. The 'OS (C)' folder is selected, showing a list of files and folders with their names, sizes, and dates.

Figure 1: Publisher and Subscriber - Part 1



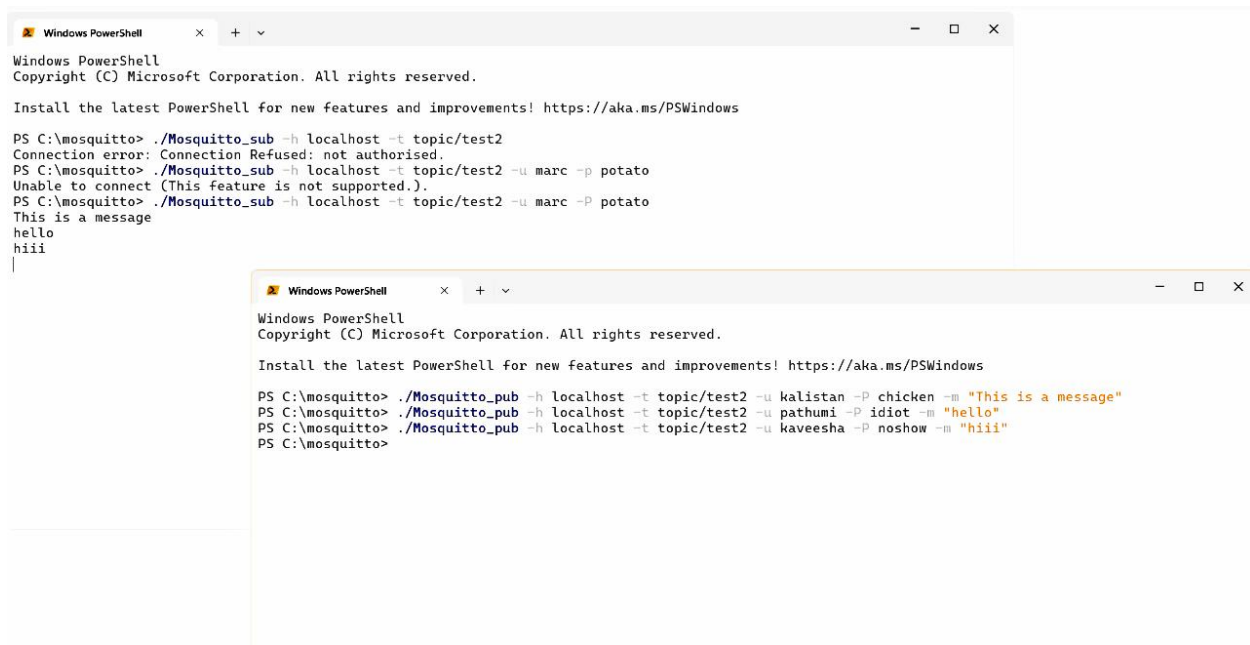
The screenshot shows a text editor window with a file named 'pass.txt' open. The file contains several lines of text, including a long string of characters and a URL. Below the text editor, there is a PowerShell terminal window showing the following commands and output:

```
PS C:\WINDOWS\system32> cd C:\Program Files\mosquitto
C:\Program : The term 'C:\Program' is not recognized as the name
of a command, function, script, or executable program. Check the spelling of the name, or if a path was included,
check the path.
At line:1 char:1
+ C:\Program Files\mosquitto
+ ~~~~~
+ CategoryInfo          : ObjectNotFound: (C:\Program:String
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\WINDOWS\system32> cd C:\Program Files\mosquitto
Set-Location : A positional parameter cannot be found that accep
At line:1 char:1
+ cd C:\Program Files\mosquitto
+ ~~~~~
+ CategoryInfo          : InvalidArgument: (:) [Set-Location
+ FullyQualifiedErrorId : PositionalParameterNotFound,Micro

PS C:\WINDOWS\system32> cd "C:\Program Files\mosquitto"
PS C:\Program Files\mosquitto> ./mosquitto_passwd -D pass.txt
PS C:\Program Files\mosquitto>
```

Figure 2: Creating and Hashing the Passwords



The image shows two overlapping Windows PowerShell windows. The top window displays the output of the Mosquitto subscriber command, showing a connection error followed by successful receipt of three messages: "This is a message", "hello", and "hiiii". The bottom window displays the Mosquitto publisher command, showing the successful sending of the same three messages with their respective usernames and passwords.

```
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PS C:\mosquitto> ./Mosquitto_sub -h localhost -t topic/test2
Connection error: Connection Refused: not authorised.
PS C:\mosquitto> ./Mosquitto_sub -h localhost -t topic/test2 -u marc -p potato
Unable to connect (This feature is not supported.).
PS C:\mosquitto> ./Mosquitto_sub -h localhost -t topic/test2 -u marc -p potato
This is a message
hello
hiiii

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PS C:\mosquitto> ./Mosquitto_pub -h localhost -t topic/test2 -u kalistan -p chicken -m "This is a message"
PS C:\mosquitto> ./Mosquitto_pub -h localhost -t topic/test2 -u pathumi -p idiot -m "hello"
PS C:\mosquitto> ./Mosquitto_pub -h localhost -t topic/test2 -u kaveesha -p noshow -m "hiiii"
PS C:\mosquitto>
```

Figure 3: Publisher and Subscriber with passwords

```
import paho.mqtt.client as mqtt
import RPi.GPIO as GPIO
import time

LEDin=18

GPIO.setmode(GPIO.BCM)
GPIO.setup(LEDin,GPIO.OUT)

def on_message(client, userdata, message):
    if (str(message.payload.decode("utf-8"))== '1'):
        GPIO.output(LEDin,GPIO.HIGH)
        print("Received Message: ", str(message.payload.decode("utf-8")))
        time.sleep(2)
    else:
        GPIO.output(LEDin,GPIO.LOW)
        print("Received Message: ", str(message.payload.decode("utf-8")))
        time.sleep(2)

mqttBroker = "192.168.8.115"
client = mqtt.Client(client_id="subscriberclient", callback_api_version=mqtt.CallbackAPIVersion.VERSION2)
client.username_pw_set("marc", "potato")
client.connect(mqttBroker)
client.subscribe("topic/led")
client.on_message = on_message
client.loop_forever()
```

Figure 4: Subscriber Code for Raspberry Pi

```

import paho.mqtt.client as mqtt
import time

mqttBroker = "localhost"
client = mqtt.Client(client_id="publisherclient", callback_api_version=mqtt.CallbackAPIVersion.VERSION2)
client.username_pw_set("marc", "potato")
client.connect(mqttBroker)

while True:
    val = input("Enter LED value (1=on, 0=off, q=quit): ")
    if val.lower() == 'q':
        break
    if val in ['0', '1']:
        client.publish("topic/led", int(val))
        print(f"Just published {val}")
        time.sleep(1)

```

Figure 5: Publisher Code for Laptop

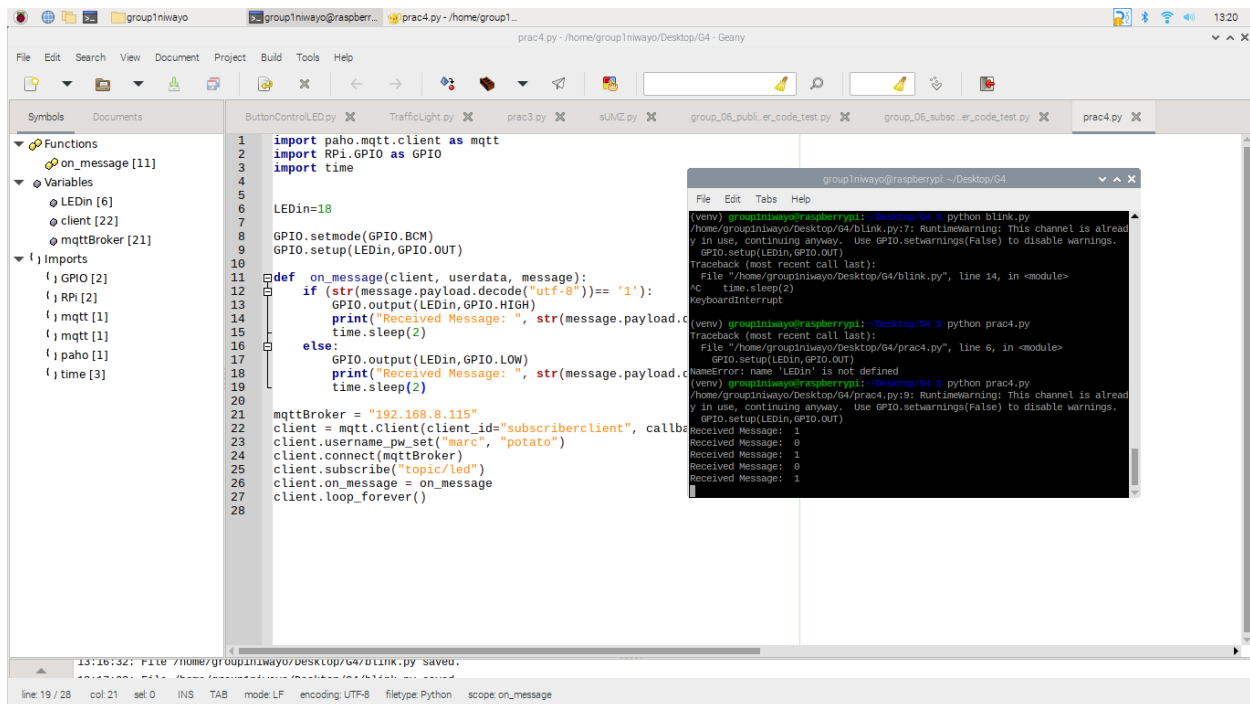


Figure 6: Case Study receiving the signal