

Employee Access Control System

Group 4

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Introduction
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Employee Access Control System

Purpose: Control and manage personnel entry and exit in specific areas.

User Interface - Employee Terminal

- Description: Keypad input for employees, displaying on LCD screen.
- Incorrect Password: 0.5s buzzer alert, LCD shows "Incorrect."
- Correct Password: LCD displays "Correct."

Management Interface

- Description: Web interface for administrators.
- Real-time Video Stream: Monitor the person entering password via video stream.
- On/Off Button: Control buzzer to expel unauthorized individuals.

Demo

User Interface:

https://youtube.com/shorts/u9iraENu_ps

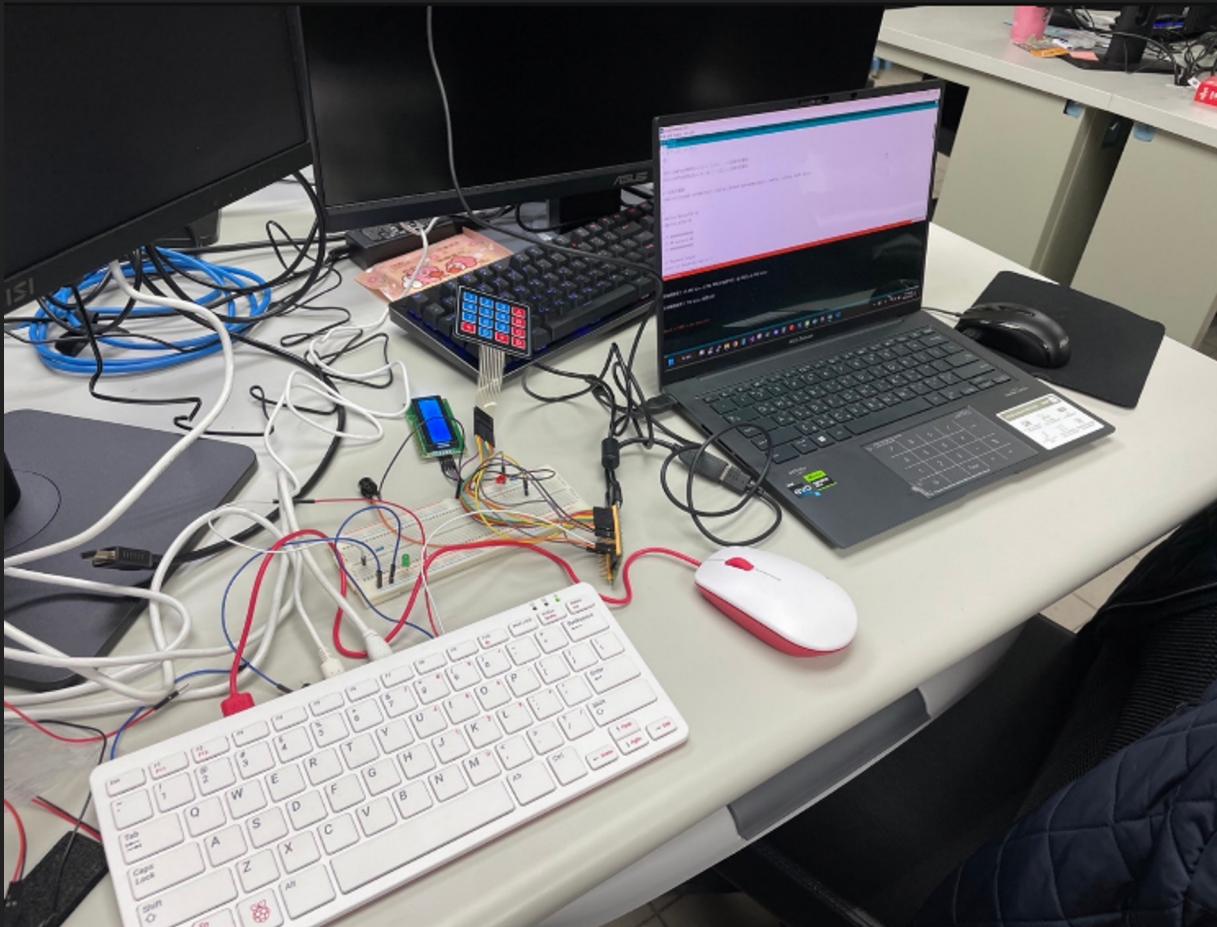
Management Interface

https://www.youtube.com/watch?v=uD_uT3pB8uw

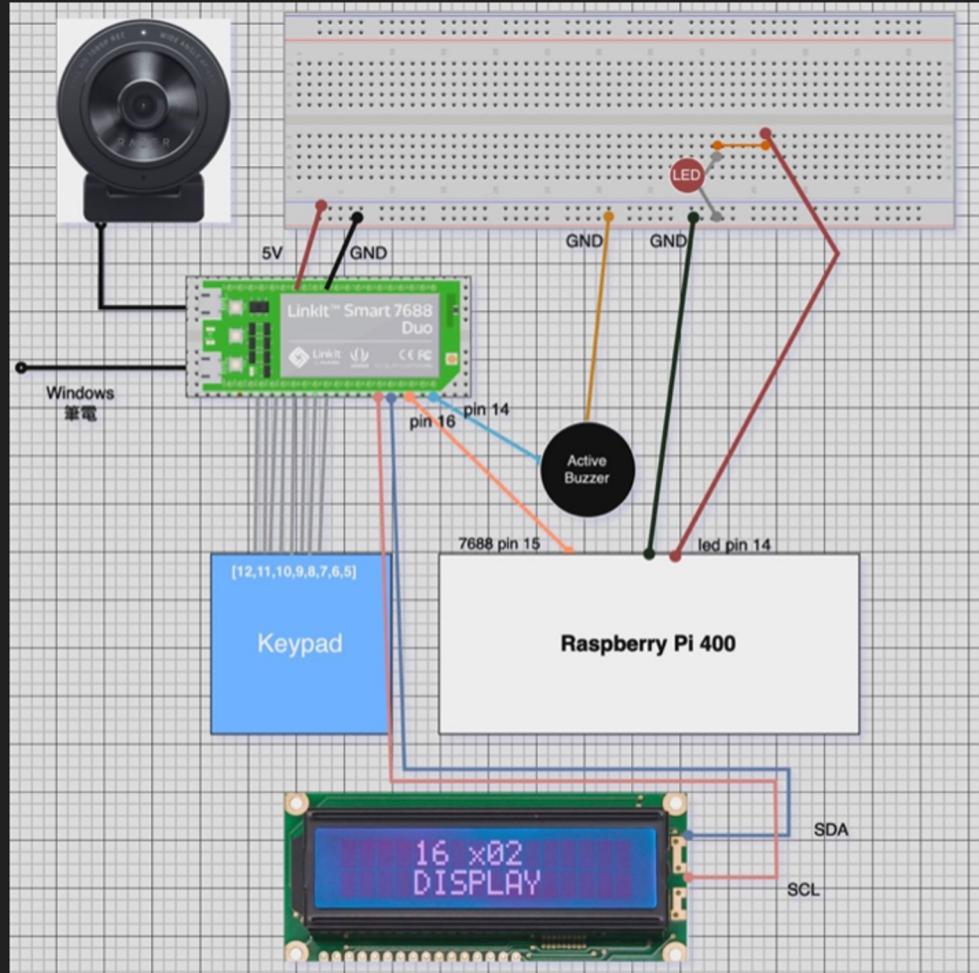
Software Version

Software	Version	Github	Reference
Arduino IDE	1.6.5		https://www.arduino.cc/en/software
Adafruit_Keypad	1.3.2	Adafruit_Keypad	https://blog.jmaker.com.tw/arduino-keypad-4x4/
Wire	1.0.0		https://www.arduino.cc/reference/en/language/functions/communication/wire/
LiquidCrystal_I2C	1.1.2	https://github.com/fdebrabander/Arduino-LiquidCrystal-I2C-library	https://referencearduino.cc/reference/en/libraries/liquidcrystal-i2c/
Python	2.7		https://www.python.org/

Implement
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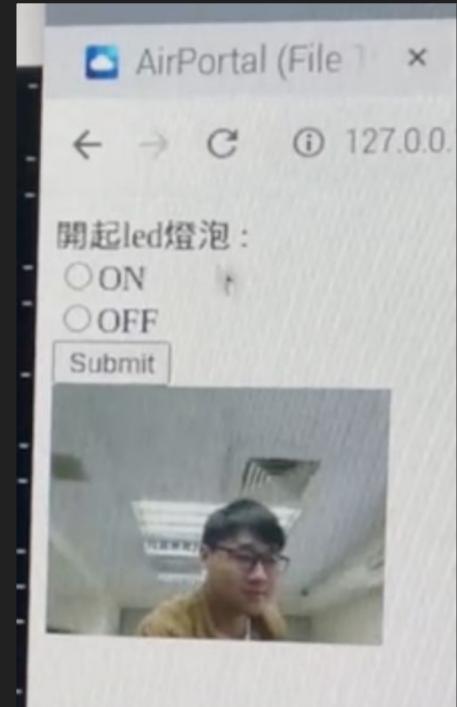


Diagram

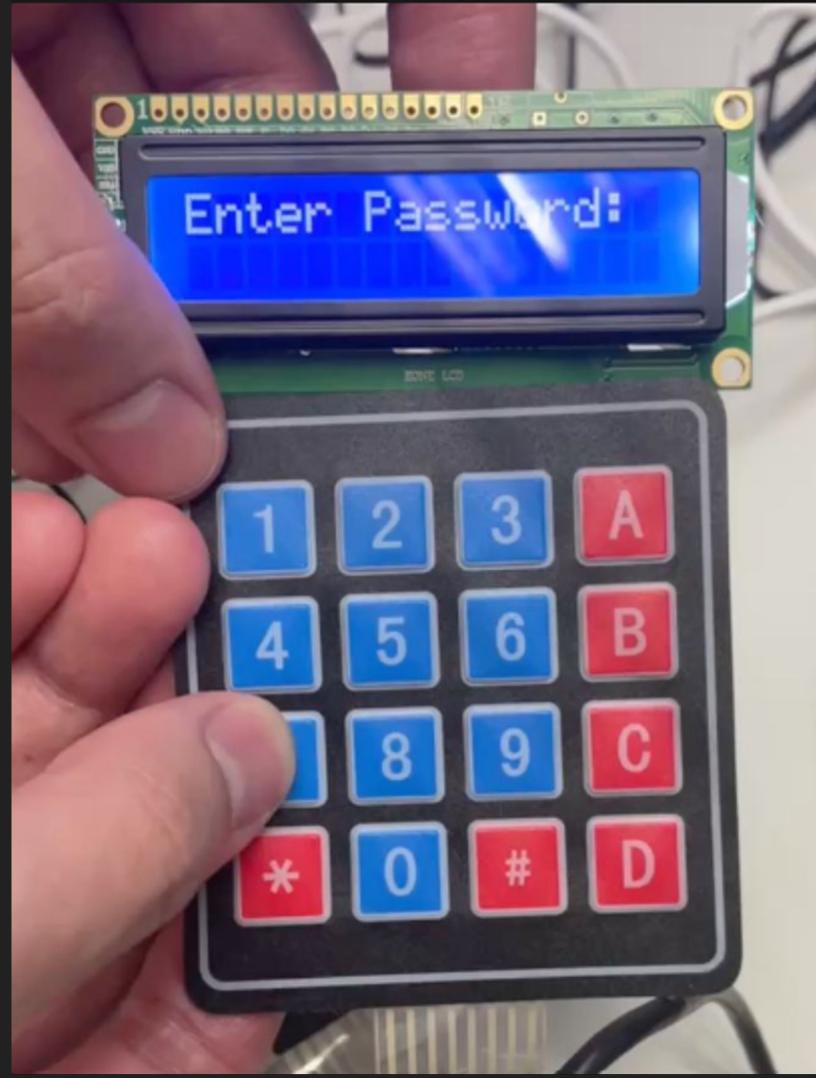


Management Interface

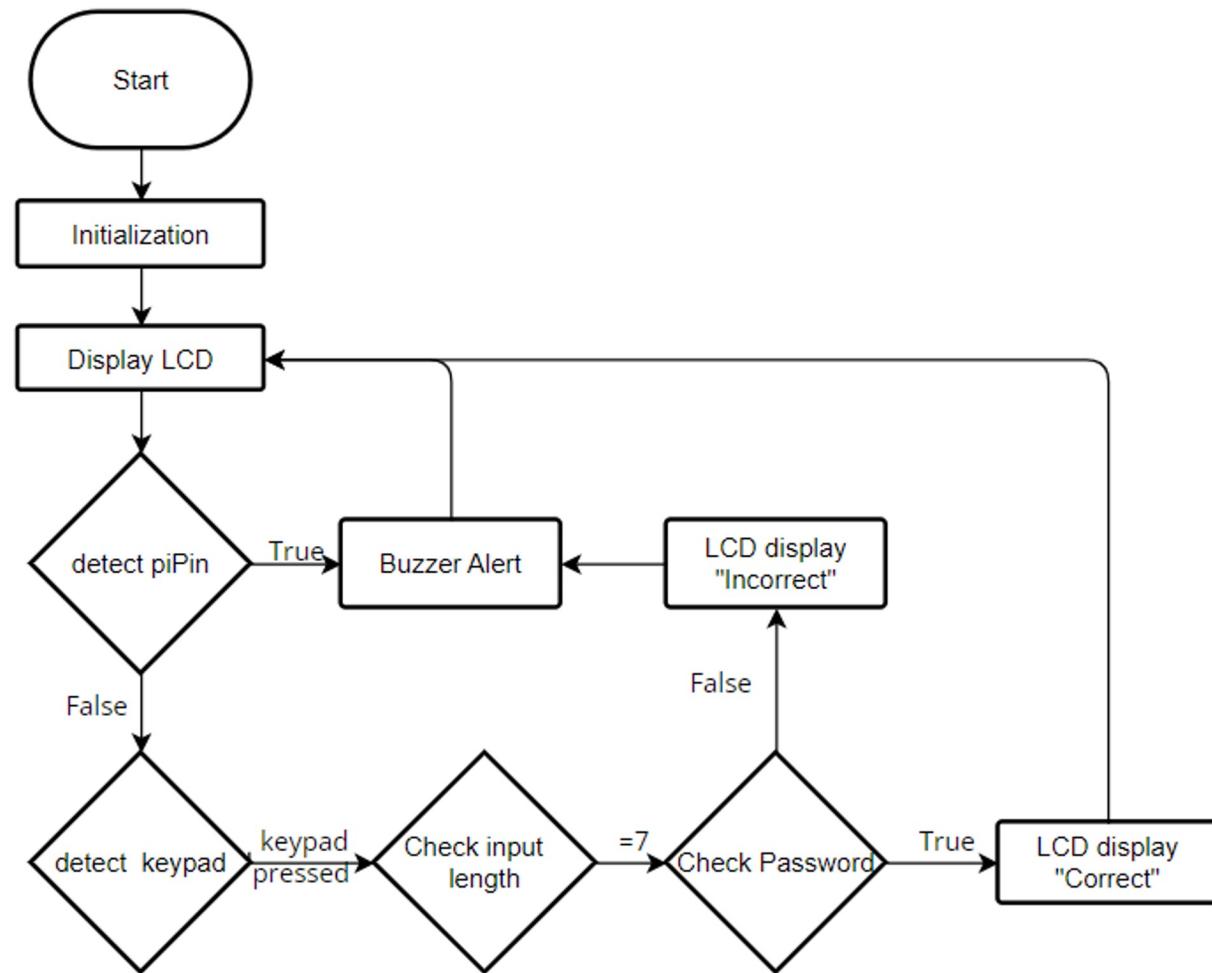
- Python flask
- Real-time Video Stream:
Monitor the person entering password via video stream.
- On/Off Button:
Control buzzer to expel unauthorized individuals.



User Interface



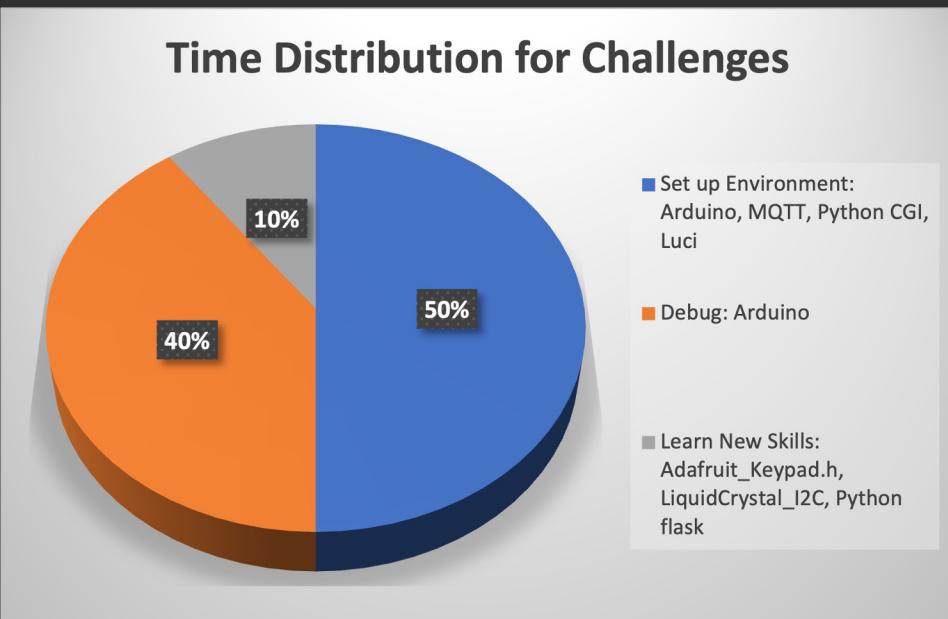
Flow Chart



Challenge

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- Built-in version of Python, pip package and setuptools are very low, which prevents me from installing other software packages or even updating Python, pip and other packages.
- In CGI Python, redirecting to another webpage is cumbersome. It requires the direct printing of HTML structure. Therefore, we moved the server and web pages to Raspberry Pi 400, which is easier to set up web framework such as Flask. The Linkit smart 7688 Duo is only responsible for receiving and transmitting data from the client.

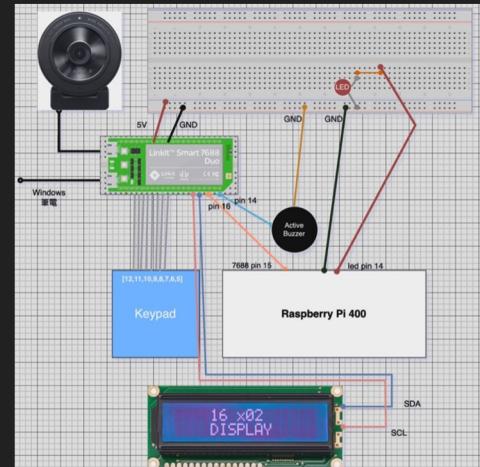
```

if __name__ == '__main__':
    YourFormProcessor.Process_Form() # This is your logic to process the form.

    redirectURL = "/?r=%s" % random.randint(0,100000000)

    print 'Content-Type: text/html'
    print 'Location: %s' % redirectURL
    print # HTTP says you have to have a blank line between headers and content
    print '<html>'
    print '  <head>'
    print '    <meta http-equiv="refresh" content="0;url=%s" />' % redirectURL
    print '    <title>You are going to be redirected</title>'
    print '  </head>'
    print '  <body>'
    print '    Redirecting... <a href="%s">Click here if you are not redirected</a>'
    print '  </body>'
    print '</html>'


```



- Linkit smart 7688 Duo is not compatible with the latest version of Arduino IDE. It requires an older version of Arduino IDE 1.6.5 and a series of complicated installing process to be able to use it.
- MediaTek's board package for 7688 duo no longer exists. We then found JSON and ZIP files on GitHub saved by other developers to install it in Arduino IDE 1.6.5.

Arduino IDE 1.6.5



The screenshot shows the Arduino IDE 1.6.5 interface. On the left, there's a sidebar with 'README' and a link to 'linkit_7688_duo_sh730'. Below it, under 'How to Use', there are two sections: '1.modify url in "package_mtk_linkit_smart_7688_index.json" file from <http://localhost> to Your Website URL' and '2. Open Arduino Preferences--> Boards Manager URLs add your website url such as "http://localhost/package_mtk_linkit_smart_7688_index.json"'. A red arrow points from the first section to a 'Package index specification' page on GitHub.

Package index specification

This GitHub page contains the JSON and ZIP files for the Teeny LC board. The JSON file includes fields like 'name', 'version', 'url', 'category', 'description', 'files', 'keywords', 'platforms', 'boards', and 'examples'. The ZIP file is a build for AVR32.

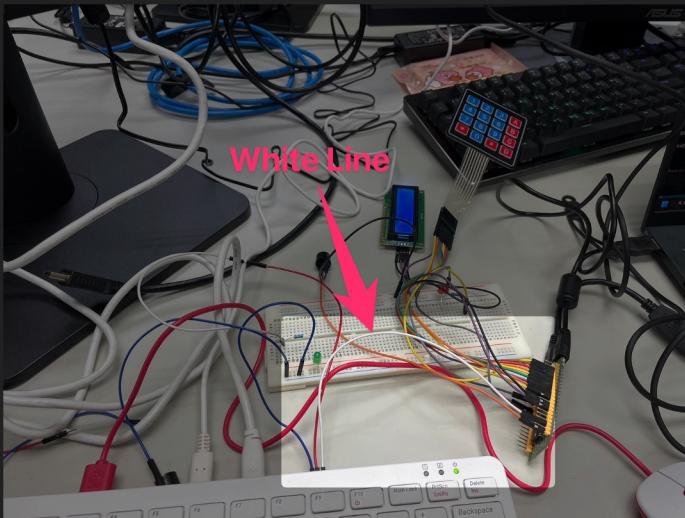
Missing field : checksum

A red box highlights a warning in the JSON file: 'The file does not contain a checksum. This will cause problems if the file is corrupted during download. To prevent this, add a "checksum" field to the file. The checksum must be a SHA-256 hash of the file content.'

Arduino IDE 1.6.5

The Arduino IDE window shows the 'Board' menu open with 'Teeny LC' selected. The status bar at the bottom indicates 'Teeny LC, Serial, 80 MHz, US English on COM1 (CDC/ACM)'. A red box highlights the 'Serial ports' dropdown showing 'COM1 (CDC/ACM)'.

- Lastly, the Arduino MQTT WiFi package cannot allow me to connect to mobile hotspot, resulting in only receiving user data but cannot send it to Pi 400. On the other hand, the MQTT works fine with Python, which means the problem lies in either the Arduino IDE's version issue or the unsuitable WiFi library.
- To solve the communicating issue, we then connect one pin of Pi 400 and Duo to synchronously send 1 or 0 to pi 400 whenever we receive a user message.



```
 1 int piState = digitalRead(piPIN);
 2 Serial.println(piState);
 3 if (piState == HIGH){
 4     digitalWrite(BuzzerPIN, HIGH);
 5     delay(100);
 6     digitalWrite(BuzzerPIN, LOW);
 7 }
 8 else{
 9     digitalWrite(BuzzerPIN, LOW);
10 }
11 }
```

Conclusion

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Future Extensions

We can extend our project to include features such as **recording video when someone enters the wrong password at the door.**

Setting up a **sentry mode like Tesla**, where the system activates video recording when someone enters the LAB.

Capturing wildlife, it allows for staying in a **safe location**. When animals show up, recording can be initiated **without causing any disturbance** to them.

Future Extensions-Tesla Sentry Mode

Tesla-哨兵模式

車內攝影機啟動

APP發出警報系統

偵測可疑行為

碰撞.損壞

車主立刻得知狀況



CBC NEWS | 下載APP看直播 | 1:16 / 1:56

特斯拉停路邊遭破壞後照鏡 車內「哨兵模式」全都錄



東森新聞 CH51

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女駕駛惱羞怒刮隔壁特斯拉 被「哨兵模式」全錄下



Future Extensions-Door Peephole



Future Extensions-Wildlife Photographer



THANKS!!

Appendix1-Nicobar Pigeon (Green Straw Rain Cape)



Distribution: the most beautiful pigeons in the world. Mainly distributed in the Nicobar Islands, the coast of India, Southeast Asia to Indonesia, New Guinea, Solomon

Appendix2-Straw Rain Cape Traditional Raincoat

