

Department of Electrical Engineering

City University of Hong Kong

EE4092/EE4905/EE4291 Training II
Module A2 - Microcomputer (Raspberry Pi)

Supplementary Note

Q&A

Q: What is a Server?

A: <https://youtu.be/UjCDWCeHCzY>

Q: What is Artificial neural networks (ANN)?

A: <https://www.youtube.com/watch?v=aircAruvnKk>

Q: What is TensorFlow?

A: <https://www.youtube.com/watch?v=tXVNS-V39A0>

Q: What is OpenCV?

A: <https://www.youtube.com/watch?v=kdLM6AOd2vc>

Q: How to run a mobile application on your phone after writing it on Android Studio?

A: <https://developer.android.com/training/basics/firstapp/running-app>

Q: How to install Raspberry Pi OS?

A: https://www.youtube.com/watch?time_continue=968&v=4z9trGhCbfg&feature=emb_title

Q: How to uninstall Raspberry Pi OS?

A: You can use the tool “SD Memory Card Formatter” to format the SD card.

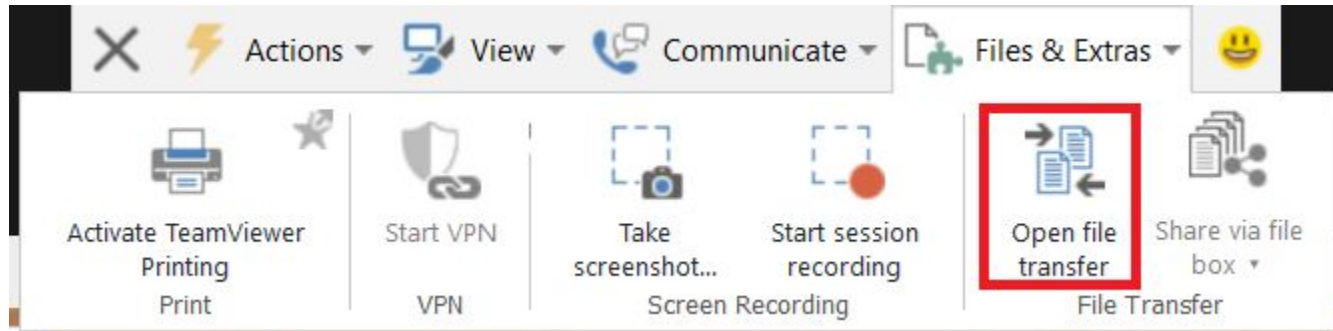
Download here: <https://www.sdcard.org/downloads/formatter/>

Q: What is GPIO of Raspberry Pi?

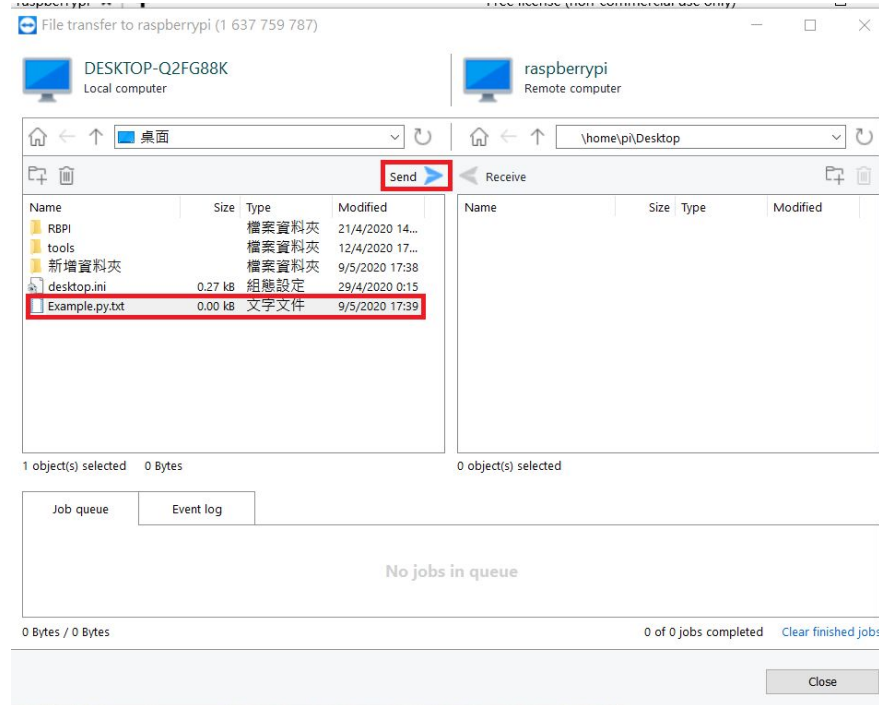
A: <https://www.raspberrypi.org/documentation/usage/gpio/>

File Transfer on Teamviewer

1. After connect to Raspberry Pi by Teamviewer. Open “File & Extras” → “Open file transfer”

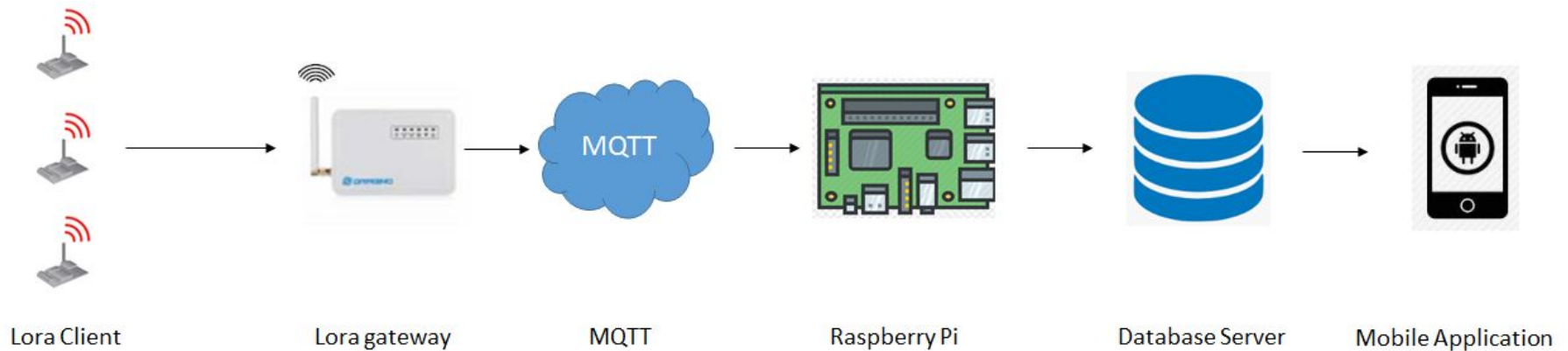


2. Choose the file you want to transfer to Raspberry Pi from your PC and “Send”.



Further Development

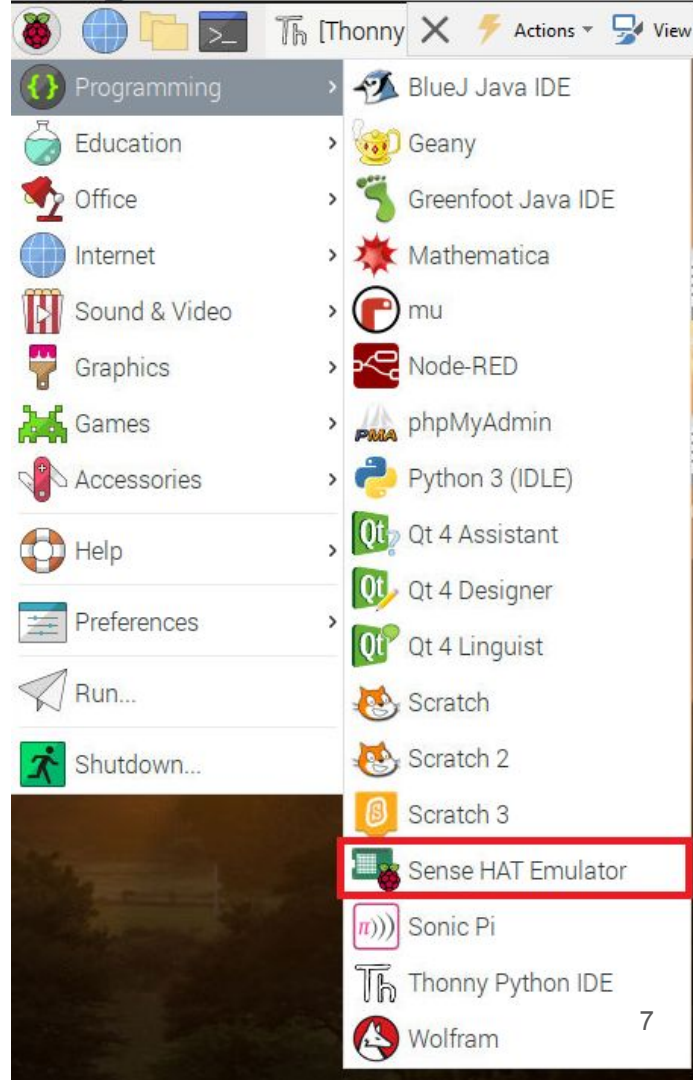
Raspberry Pi can combine with Lora technology and perform long-range communication. The user also can use the mobile application to monitor the result from Lora client. The whole picture is shown below:



More Games

1. Try to write a “Avoid Pipes” game with LED matrix and joystick in Raspberry Pi emulator.
 - a) Open Sense Hat Emulator
 - b) Open Thonny Python IDE
 - c) Include this command into your Python code to import the Sens Hat Emulator’s library:

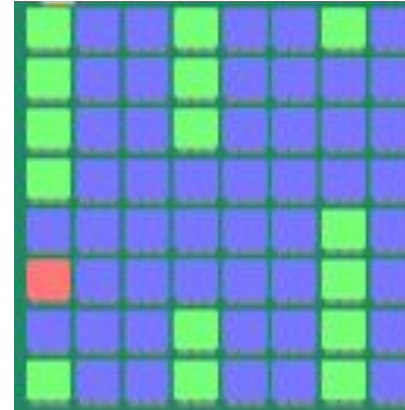
```
from sense_emu import SenseHat
```
 - d) When you finish your code, click “Run” on Thonny Python IDE and click the joystick on the emulator by mouse. Then, you can control the emulator by the keyboard.



Rules:

- All pipes will generate on the map with 3 random continue gaps
- Each pipe has 2 units apart
- App pipes will move to the left with 1 unit every second
- Create an object on the upper left corner when the game starts
- Control the object to avoid all the pipes by joystick

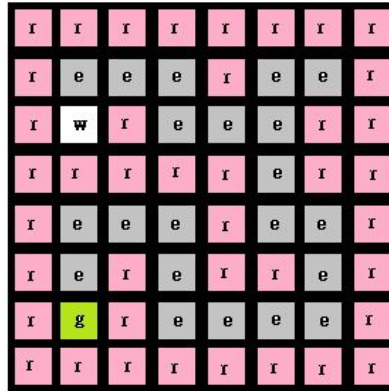
The map should show the following:



More Games

2. Try to write a “Escape Maze” game with LED matrix and IMU sensor in online emulator.

First, design your maze with 8x8 pixels. Red pixels refer to the wall, empty pixels refer to the road and green pixels refers to the exit. Then, create a white pixel refers to a man at (x = 1, y = 2)



Rules:

- Lead the man to escape the maze by orientation sensors of the Sense HAT
- When the man escapes successfully, show a message on screen and end the game
- The man will block by the wall and try to find the only one escape route

Hits:

- If the value of pitch is between 1 and 179, move to left
- If the value of pitch is between 181 and 359, move to right
- How about roll?