[**1.** **Parking meter code:** 1](#_Toc102317770)

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[4. **Finite State Machine (FSM) diagram** 4](#_Toc102317773)

# **Parking meter code:**

rpi\_pub\_and\_sub-maxcProj.py

for testing:

vm\_publisher-maxcProj.py

vm\_subscriber-maxcProj.py

Test process is similar the process of lab5.

# **Connection:**

The connection shown as Figures below:

A close-up of a circuit board

Description automatically generated with low confidence

A close-up of a circuit board

Description automatically generated with low confidence

# **Comment:**

Since the limitation of time and hardware, some inputs are simplified but enough to verify the main idea of the notification system.

**Inputs:**

~> One button: module to simulate coin as pressing button.

~> Rotary sensor: simulate entering email address, pick up one email from an array of 5 according to the value of rotary sensor.

~> Ultrasonic Ranger: detect if the lot is occupied.

~> Subscribe message of online payment (pressing ‘m’ one time through vm\_publisher-maxcProj.py on the terminal adds 10 cent for example).

**Outputs:**

~> LCD + LED: display time left, blinking patterns, and prompts.

~> Publish message of email address, further actions, and time left. (See rpi\_pub\_and\_sub-maxcProj.py). The publisher can interpret the message accordingly (“:” as delimiter):

Normal format: email+":"+str(timeLeft) +":"+newstate

Illegal case: email+":fine"+":"+newstate

Normal leave: email+":null"+":"+newstate

ACK 4 payment: "ACK"+":"+str(timeLeft) +":"+state

**SINGLE NODE:**

1. Raspberry Pi (w/ GrovePi Sensor Board)

5 states

* + - 1. IDLE STATE (no car, no money)
         1. GREEN LED, “Idle” LCD Screen
      2. LOADING STATE (new car, no money)
         1. RED LED, “Coins and Email” Screen
         2. Displays amount of money put in, how much time is left

*After 1 minute, transitions to ILLEGAL , SAFE STATE , or IDLE*

* + - 1. SAFE STATE (car exists, money exists)
         1. Green LED, “Time Left: XX min”
      2. EMPTY STATE (no car, money exists)
         1. Green LED, “Time Left: XX min”
         2. Ability to add more money, or add new email to node
         3. Consider when a car leaves early, but cannot email old person
      3. ILLEGAL STATE (car exists, no money)
         1. RED BLINKING LED, “Please Move”

# **Finite State Machine (FSM) diagram**

O: Occupied, occupy = true. !O: Unoccupied, occupy = false.

M: Money Left, moneyLeft >0. !M: No money left, moneyLeft ==0

T: timer reaches 1 minute (roughly count by loop counter). !T: timer < 1 minute.

Diagram

Description automatically generated

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