CE2107 Lab2 Assignment Sheet (to be submitted to NTULearn before next lab)

Name: Lab Group: Date:

1. Section 6.2. Give a short 2-3 lines description on concept behind the reflectance reading process. Why does the black surface result in slower voltage decay?
2. Section 6.2. Which parameter do you need to tweak in the Reflectance\_Read() if the reflectance sensor reading is not accurate? Hint: check the 8 steps for Reflectance reading.
3. Section 6.2. Write down the procedure to initialise P7.4 to be an input pin without internal pull-up resistor
4. Section 6.3. Where are the sources of the offset error between actual distance and the estimated distance return by the function Reflectance\_Position()?
5. Section 7.2.  Figure 7. The robot state toggled between LEFT and CENTER state repeatedly when it is detected that the robot is off to the left of the line (input: ‘01’). Under such condition, do you expect the robot to move toward the right in the zig-zag pattern or do you expect it to move in the smooth curve. Assume we shorten the time in each state from 500msec to 5 msec.
6. Section 7.3. Fix the bug in the 11-state FSM design.  
   A picture containing table

   Description automatically generated
7. Section 7.3. What is the purpose of toggling LED within the main routine or ISR?
8. Section 7.4. What hardware and software modifications are required in order for the robot to move within a lane, i.e. between two black lines, instead of following a line? Detail algorithm not required. Just one bullet point each for hardware and software.