

Project 1 Assignment

This project requires you to design a system analogous to a car parking mechanism. For this project, you will use a Keypad, LCD screen, two different color LED lights, an ultrasonic sensor, and a FRDM KL25Z board.

Start by asking the user to input a distance; this is the value on which you will perform all your calculations. Compare this input with the distance values you obtain from the ultrasonic sensor and implement the following mechanism:

- i) When the distance from the ultrasonic sensor is less than the input distance, one LED should turn on. When the distance is greater than the input, no LED should be on.
- ii) When the distance from the ultrasonic sensor is between $\frac{1}{3}$ and $\frac{2}{3}$ of the input distance, the other LED light should display a 5-level brightness, turning the light on and dimming it continuously with 5-level brightness each way (Hint: Use PWM). The previous LED light should turn off from here onwards.
- iii) When the distance is less than $\frac{1}{3}$ of the input distance, the light in step 'ii' should be stable.
- iv) When the object is moving forward, the freedom board PWM light should be yellow, and when the object is moving backward, the PWM light on the freedom board should be blue. At rest, this light is turned off.

Ensure that the distance from the ultrasonic sensor is displayed on the LCD screen at all times after you have taken the input reading from the user. The lights, both LED and in-built FRDM KL25Z one, should be turning on and off according to the mechanism above at all times afterward.