Lift Control System

In this project, you will develop a system to simulate a lift controller for a 9-floor building by using the AVR Development Board.

Generally, a lift has an internal control panel and an external control panel at each floor. The design for the control system is specified as follows:

1. Control panels:
    a. The internal control panel of the lift has only 9 buttons for floor numbers. Button 1 is for the first floor and button 9 for the 9th floor etc. For simplicity, there are no buttons for open and close.
    b. The external control panel at each floor has two buttons: up and down, except
        1. Floor 1 has only the up button
        2. Floor 9 has only the down button
2. Control request generation:
    Since there are 27 buttons on the internal and external control panels and there are only 16 keys on the keypad of our lab board, you need to develop a scheme to use the 16 keypad keys to simulate the 27 lift control buttons so that 27 different control requests can be generated.
3. Multiple requests and service order:
    The controller can receive many requests from both internal and external panels. The request servicing order should follow the convention design, namely, requests for going the same direction as the lift are served first.
4. Lift moving state simulation:
    We use a LED to simulate the moving state of the lift. When the lift is moving, the LED is flashing.
5. Lift operation simulation:
    a. Floor traversal time
    It takes 2 seconds for the lift to traverse one floor.
    b. Stop time
    The lift stops for 1 second at each floor if requested.
    c. System break
    When there is no more pending request, the lift stops at a floor requested by the last request
    d. Display information
    The following information must be displayed on the LCD.
        1. Lift status. If the lift is going up, “UP” is displayed. If it is going down, “DOWN” is displayed.
        2. The current floor number