Microwave Oven Controller

ELEC 330

Digital Systems Engineering

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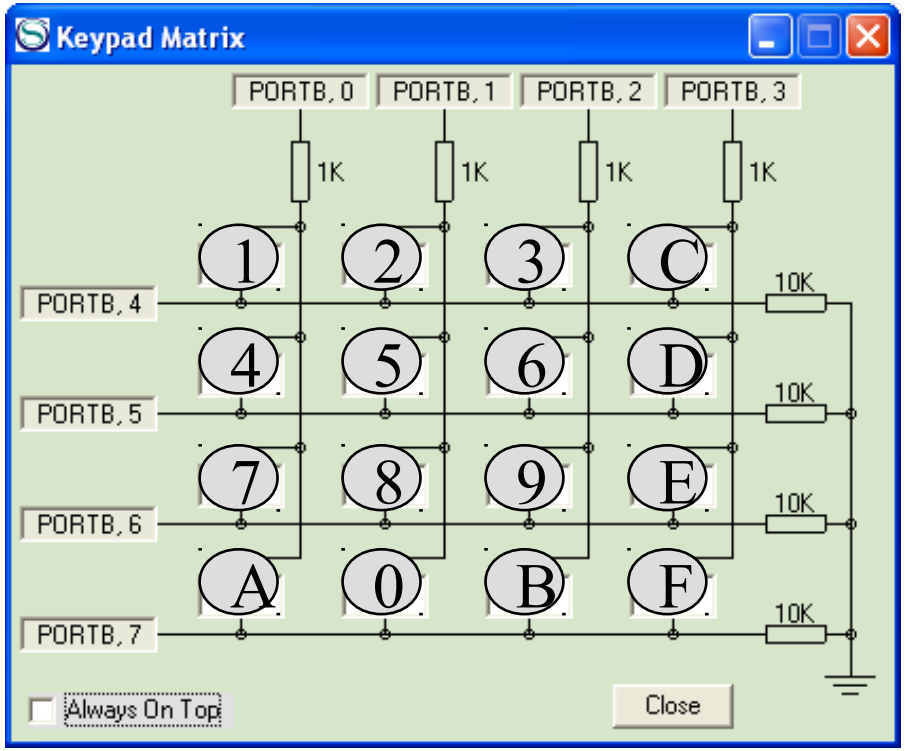
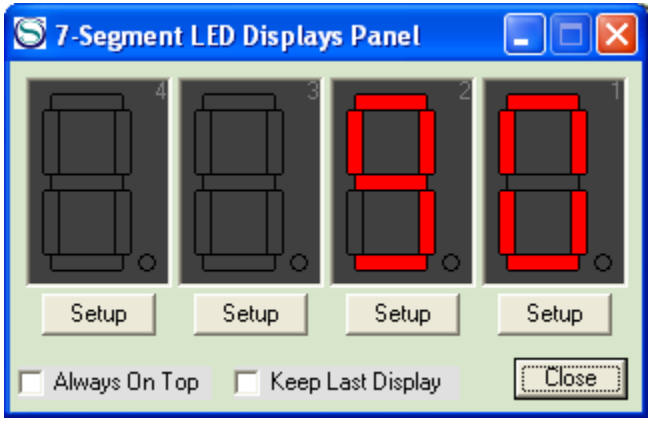
Microwave Oven Controller

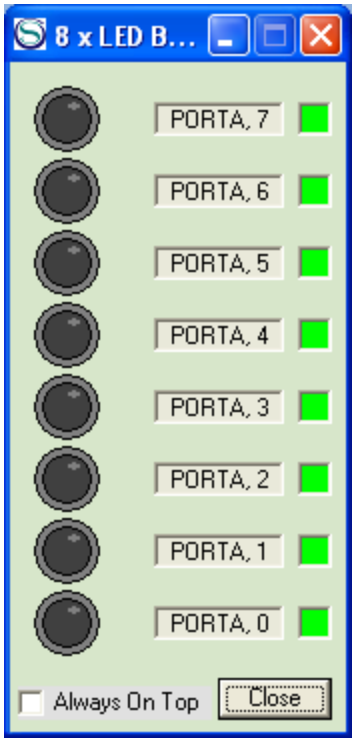
- Inputs (Keypad Matrix)
  - Single digit to set cooking time in 10s of seconds
  - Control switches for Start (F), Stop (A), and Door (B)



Microwave Oven Controller

- Outputs
  - Time - two digits (seconds) on 7-segment displays
  - Magnetron - LED (RA1) indicates active or inactive
  - Buzzer - LED (RA0) indicates cook cycle finished or not





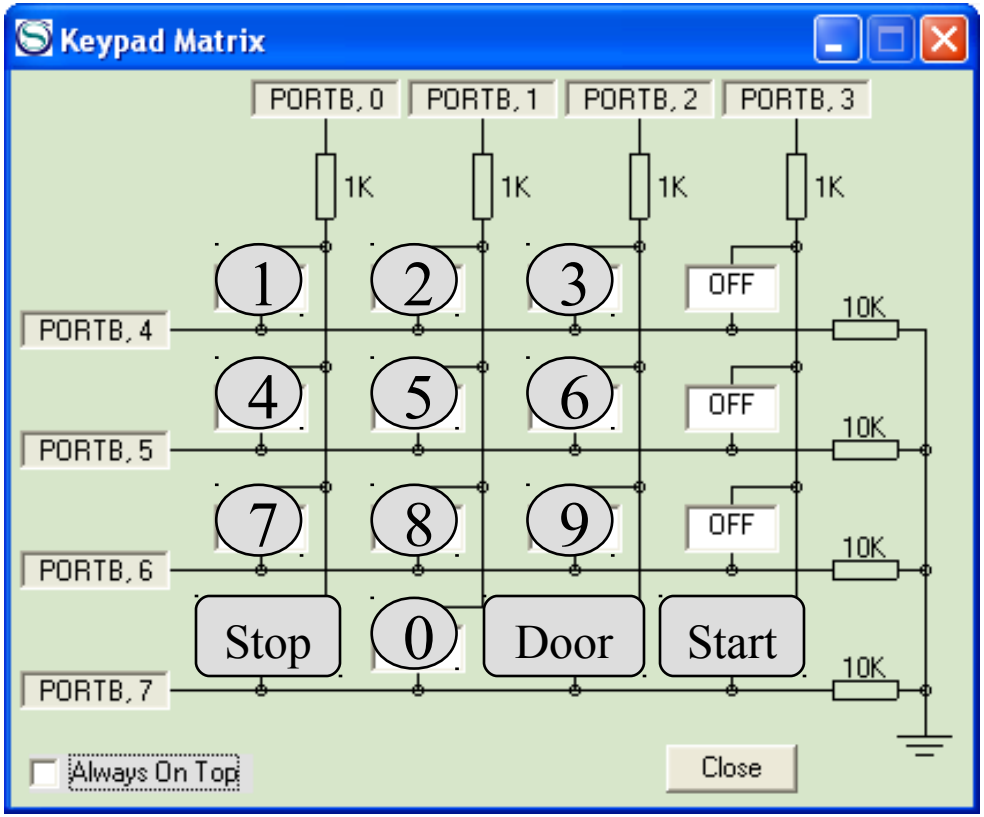
Magnetron

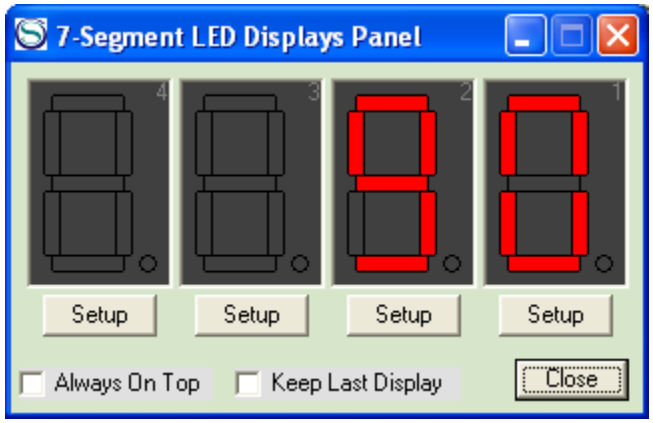
Buzzer

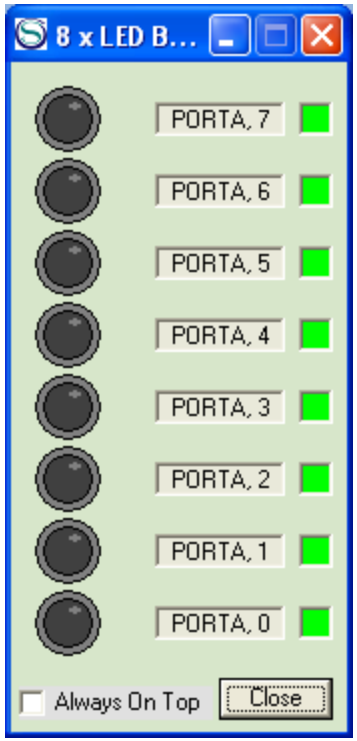
Normal Operation

- User Input
  - Read Cook Time
  - Display Cook Time
  - Wait for Start
- Cooking
  - Count down Seconds
  - Light Magnetron
- Cooking (cont)
  - Monitor Door
    - Pause if Open
  - Monitor Stop
    - Terminate cycle
- Done
  - Activate Buzzer
  - Wait for Door Open

Demo







Magnetron

Buzzer

Hints

- Use KEYCHK Subroutine (IP9-7) to interface with the Matrix Keypad
  - Input Time
  - Control Switches
- Use Timer0 to count seconds
  - Interrupt Service Routine (Ex11-2)
- Count seconds in BCD
  - Correctly decrement BCD by testing for LSD = 0
  - Use OUTLED Subroutine (IP9-3) to convert BCD digits and output to 7-segment displays

Suggestions

- Don't Procrastinate
  - Due Dates
- Use Text and Notes
  - Chapter 9 is key
- Finish Flow Charts
  - Then Start Programming
- Resources Provided
  - Top-Level Flowchart
  - Program Template
- Teams of 2 persons