
COMP551 – Interfacing Fall 2017

Lab 8

Interfacing and Programming 7-Segment Displays

Students:				
Student ID's:				
Section:	01	02	03	04

NOTE: Labs are due at the start of the next lab period. Only submit one lab per group of two students.

Lab 8 – Interfacing and Programming 7-Segment Displays

8. Introduction:

Seven segment LED (Light Emitting Diode) displays use an arrangement of 7 LED's to form a rectangular shape using two vertical segments on each side with one horizontal segment on the top, middle, and bottom (see Figure 8-1).

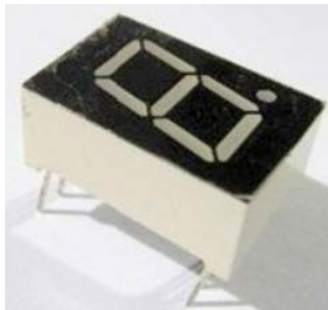


Figure 8-1

By individually turning the segments on or off, numbers from 0 to 9 and some letters can be displayed. Some seven segment displays also have an eighth segment to display a decimal point. Therefore, a seven-segment display will require seven outputs from the microcontroller to display a number, and one more output if the decimal point is to be displayed as well.

The segments are marked with non-capital letters: a, b, c, d, e, f, g and dp, where dp is the decimal point (see Figure 8-2).

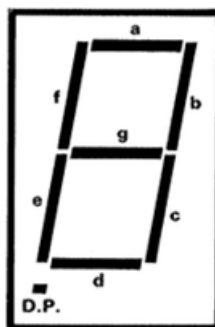


Figure 8-2

The 8 LED's inside the display can be arranged in a common cathode or common anode configuration (see Figure 8-3).

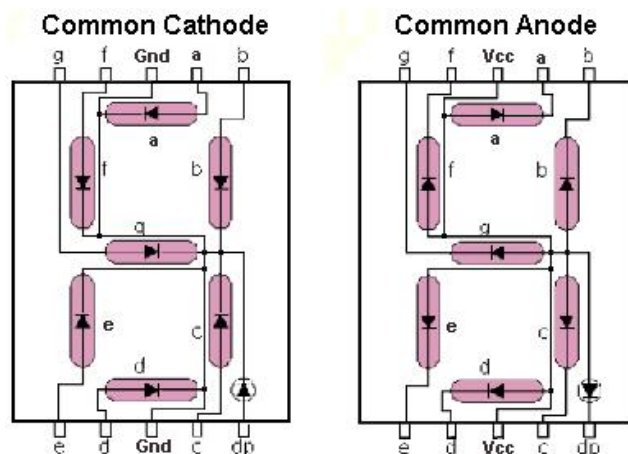


Figure 8-3

In a common cathode display, the cathodes of each of the segment LED's are tied together and this common point is connected to ground. A required LED segment is then turned on by applying a logic 1 (+5V) to its anode.

In a common anode display, the anodes of each of the segment LED's are tied together and this common point is connected to the supply voltage V_{DD} or V_{SS} . A required LED segment is then turned on by applying a logic 0 (0V) to its cathode.

Exercise:

1. Referring to Figure 8-4 and Figure 8-5, connect the common anode 7-segment display in your kit to the PIC-P40 board and write a C program to display the following sequence of characters 9, 8, 7, 6, 5, 4, 3, 2, 1, 0, F, E, d, c, b, A, (case-sensitive) continuously, with a 1.2 second delay in-between each displayed character, while the on-board button is being pressed. When the button is released, the counting should stop and continuously display the character that was being displayed when the button was released. Once the button is pressed again, the count should resume with the next character. Use Timer 0 or Timer 1 to generate the 1.2 second delay.

Demonstrate the proper operation of the program to the instructor and submit a hardcopy of your program code.

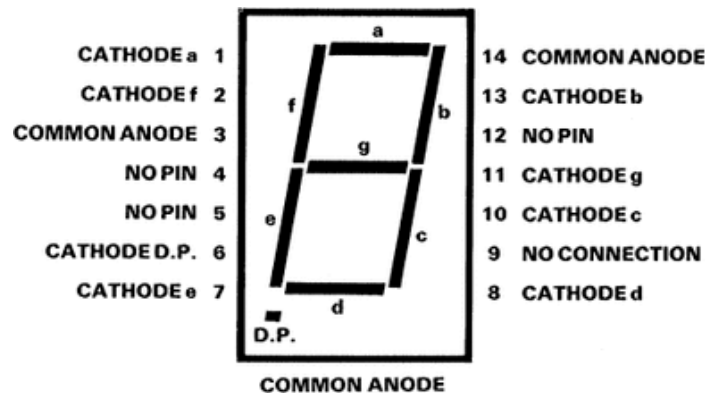


Figure 8-4

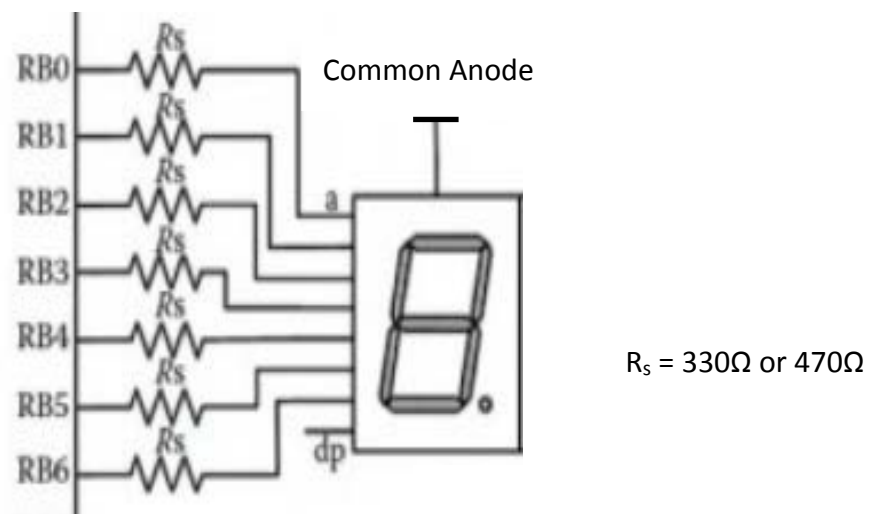


Figure 8-5

PIN DIAGRAM – PDIP (Plastic Dual In-line Package)

