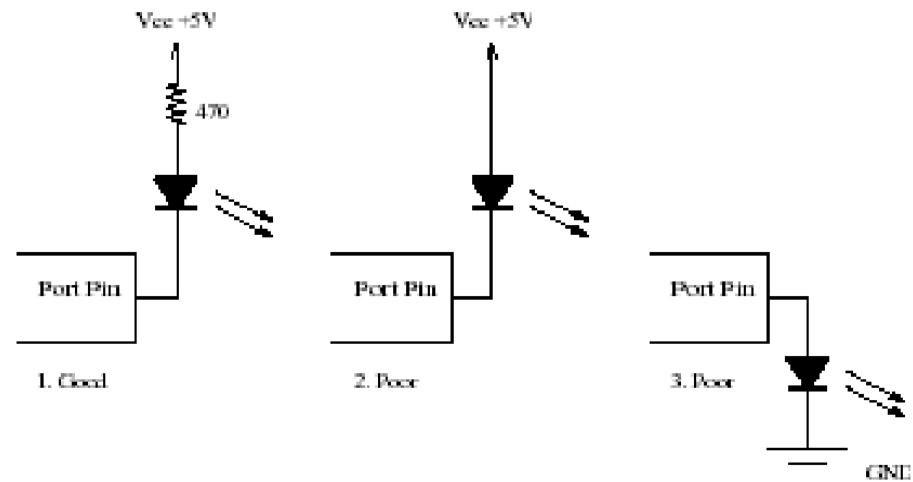


# The 7-Segment Display

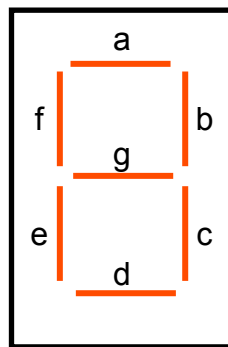
# Simple output devices

- Case-1
  - LED is ON for an output of zero
  - Most LEDs drop 1.7 to 2.5 volts and need about 10ma
  - Current is  $(5-2)/470$
- Case-2
  - Too much current
  - Failure of Port or LED
- Case-3
  - Not enough drive (1ma)
  - LED too dim



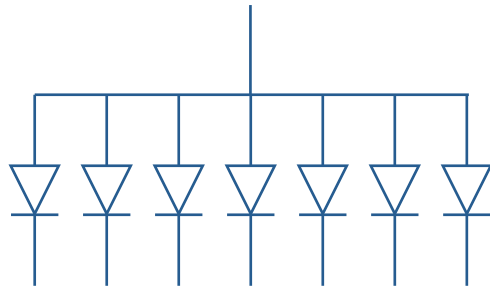
# The 7-Segment Display

- 7 LEDs arranged to form the number 8.
  - By turning on and off the appropriate segments (LEDs), different combinations can be produced.
  - useful for displaying the digits 0 through 9, and some characters.

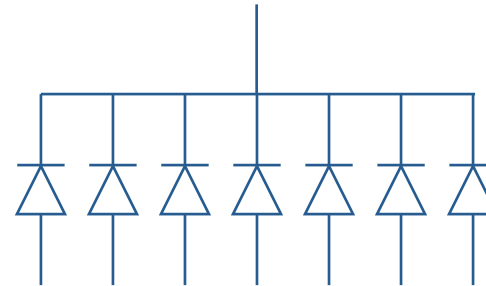


## The 7-segment Display (Cont.)

- 7-segment displays come in 2 configurations:



Common Anode

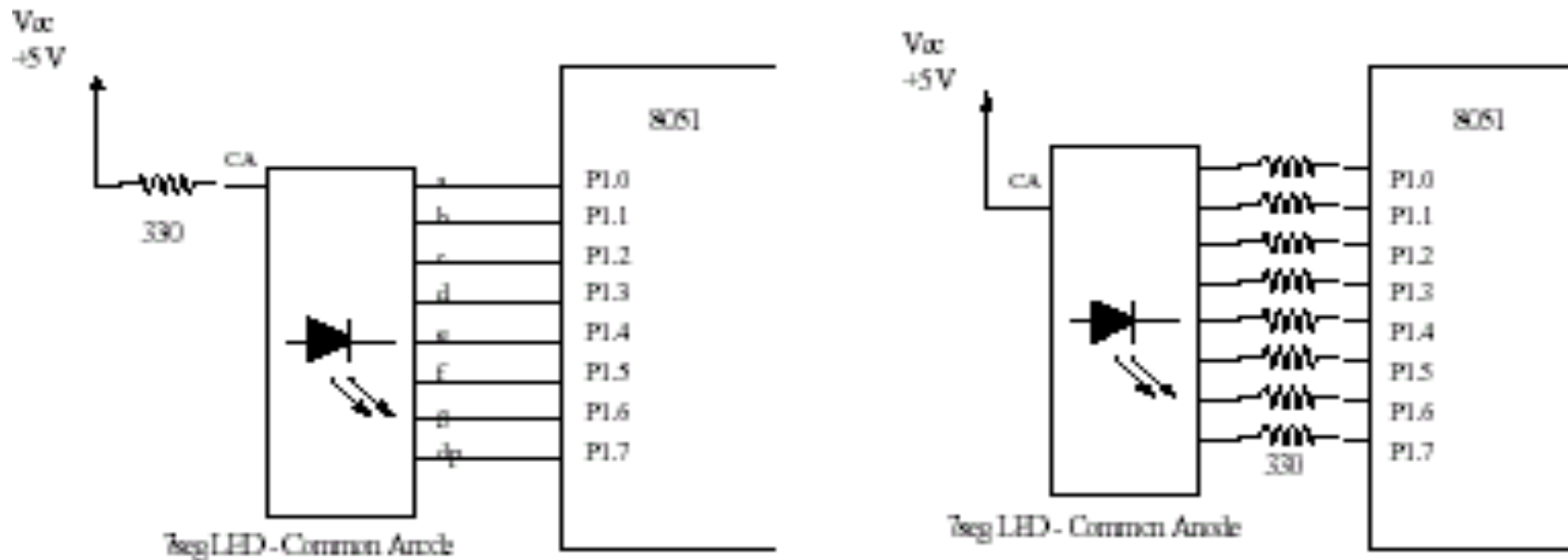


Common Cathode

- As we have seen, it would be preferable to connect the **cathode** of each diode to the **output** pin.
- Therefore, the **common anode** variety would be **better** for our interfacing needs.

## Interfacing a 7-segment display

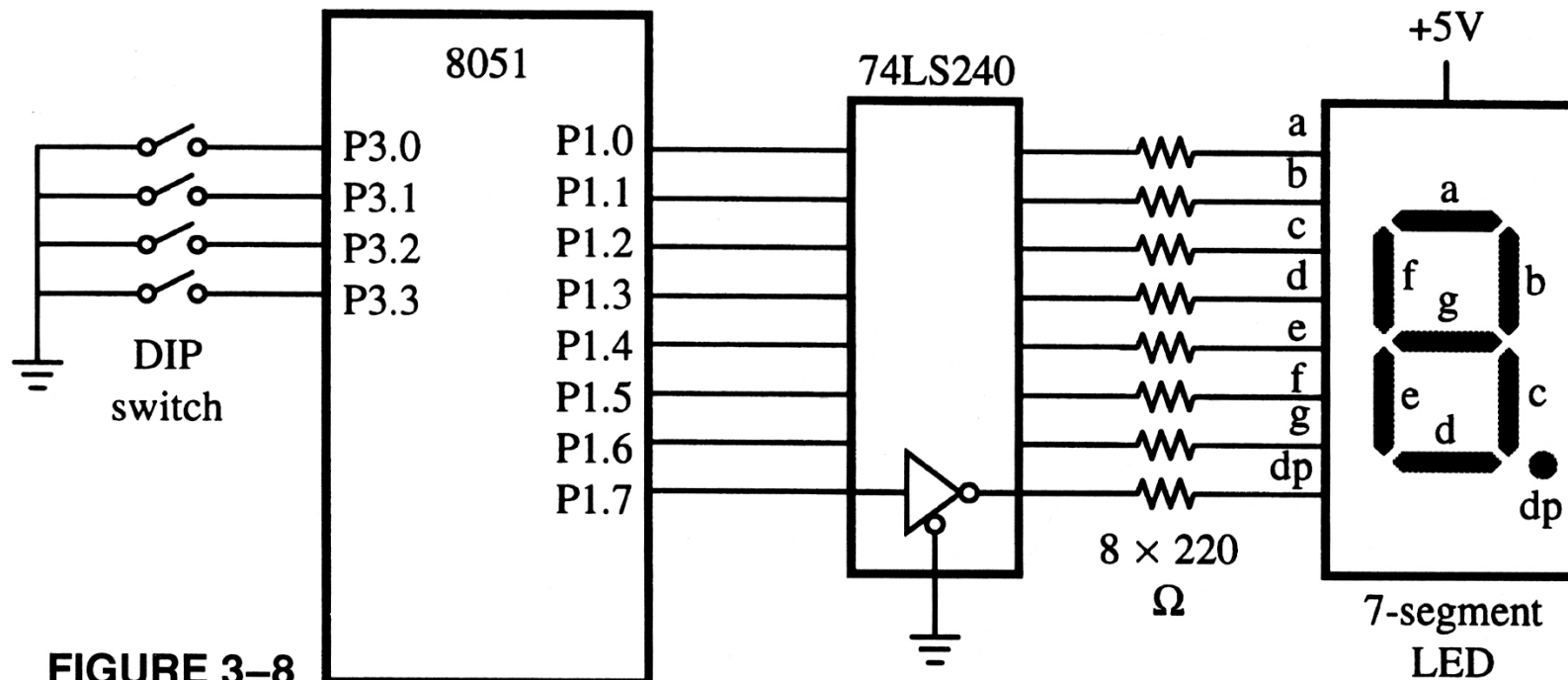
- Also, as seen with interfacing the LED, a **resistor** will be **needed** to control the current flowing through the diode.
  - This leaves two possibilities:



- Case 2 would be more appropriate as case 1 will produce different **brightness** depending on the number of LEDs turned on.

# Use of current buffer

- ❑ Interfacing to a DIP switch and 7-segment display
- ❑ Output a '1' to **ON** a segment
- ❑ We can use 74244 to common cathode 7\_seg



**FIGURE 3-8**  
Interface to a DIP switch and 7-segment LED

# BCD to 7\_Seg lookup table

```

get_code:      mov     a,p3
               anl     a,0fh
               mov     DPTR,#7s_tab
               movc    A,@A+DPTR
               mov     p1,a
    
```

```

7s_tab:       db     3fh,30h,5bh,4fh,66h
               db     6dh,7dh,07h,7fh,6fh
               END
    
```

BCD	pgfedcba 7_seg	hex
0000	0 0 1 1 1 1 1 1	3f
0001	0 0 1 1 0 0 0 0	30
0010	0 1 0 1 1 0 1 1	5b
0011	0 1 0 0 1 1 1 1	4f
0100	0 1 1 0 0 1 1 0	66
0101	0 1 1 0 1 1 0 1	6d
0110	0 1 1 1 1 1 0 1	7d
0111	0 0 0 0 0 1 1 1	07
1000	0 1 1 1 1 1 1 1	7f
1001	0 1 1 0 1 1 1 1	6f

