

Using your breadboard and wire, connect the 8 anodes to  $\sim 300\Omega$  resistors, and then to the pins of PORTD (see Figure 2 for pin mapping). Connect each of the cathodes to the collector pin of a transistor, connecting the emitter to ground and the base through a  $\sim 100\Omega$  resistor to four of the pins of PORTB. By driving a pattern of pins of PORTD high, and driving a single pin on PORTB high (thus turning on the transistor and connecting the cathode of a digit to ground), you can illuminate a single digit segment (DS) at a time.

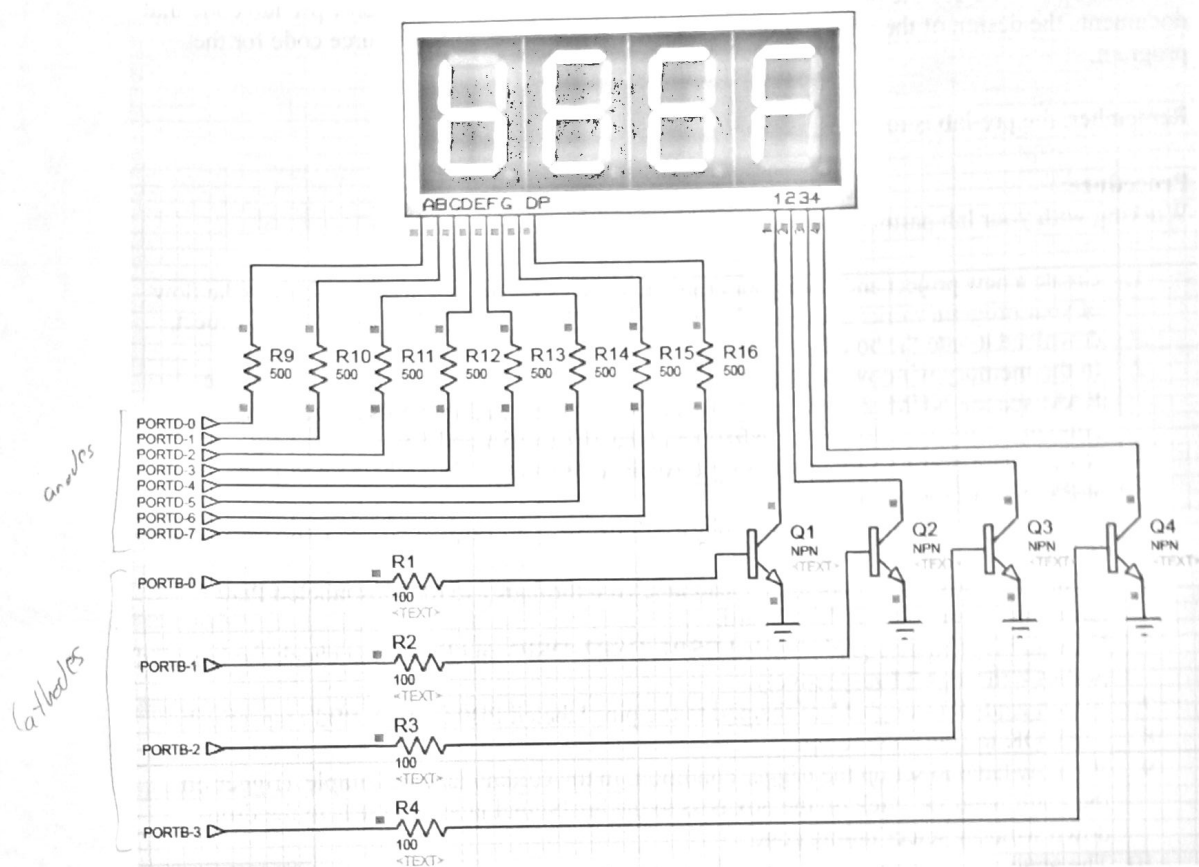


Figure 3 – Schematic wiring with simulation running

## 2N2222 pinouts



To display a 1 on the left most digit of the LED display, a \$06 would be sent to PORTD and then a binary %xxxx0001 would be sent to PORTB. The 1 in bit position 0 would turn on the transistor, which would drive the cathode for DSP1 low thereby causing segment b and segment c of that digit to illuminate. Since the other three cathodes are high, all of the segments of those digits would stay off. Finish filling in the columns in Table 2 using Figure 2.

DIGIT	Bit Position	Binary	Hex
DS1	0	xxxx 0001	X1
DS2	1		X2
DS3	2		
DS4	3		

Table 2. Digit Enable Codes

1 turns on transistor 1