

# Plan 3

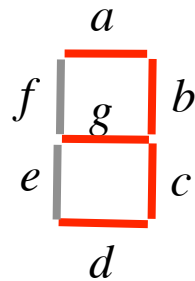
September 23– September 30

- Read Sections 4.1-12 of Chapter 4.
- Download the MARIE simulator and check that the it works.
- **Exercise 4.** Draw the logical diagrams for the parity generator and the parity checker described on pages 142-143 in the textbook. Use as few gates as possible.
- **Exercise 5.** Solve exercise 25 in Chapter 3 (page 173).
- **Exercise 6.** Solve the exercise on the next page.

## Exercise 6

Binary-Coded Decimal (BCD) is a representation of the decimal digits 0 to 9, using their binary coded equivalent. In this representation, 0 would be 0000, and 9 would be 1001.

A seven-segment display (SSD) is a set of LEDs that displays a numerical digit (common in digital watches, calculators and clock radios). The display has seven outputs ( $a, b, c, d, e, f, g$ ), as shown below.



A BCD-to-SSD decoder converts a set of four inputs ( $x_1, x_2, x_3, x_4$ ) to a seven-segment output ( $a, b, c, d, e, f, g$ ).

- (1) Provide the truth table.
- (2) Draw a circuit diagram for a decoder.