Homework 3

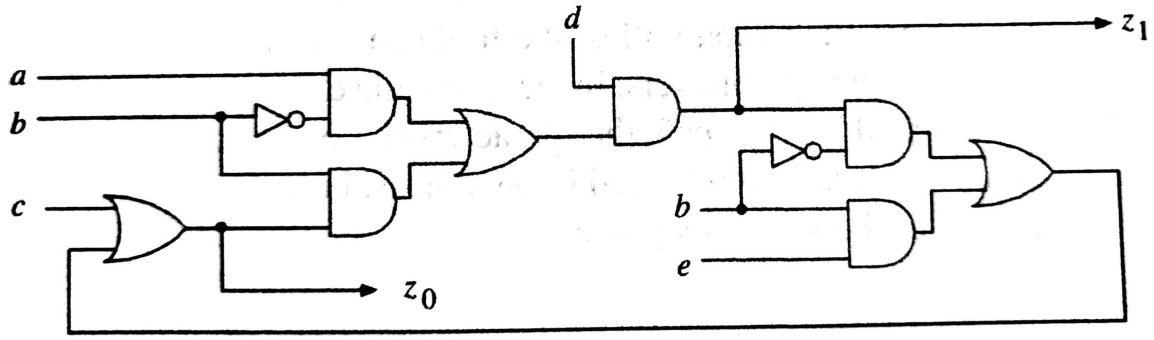
CSM51A 2019 Summer

Due to July 24 (Wednesday) 8 PM

Submit your homework on CCLE using HW3 submission link

1. Show that the set {XNOR, OR} is universal. You can use constant 0 or 1 (only one of them).

2. Show that the network in the figure below is combinational even though there is a physical loop.



3. Represent on K-maps the functions described by the following expressions

(1) $E(x, y, z) = \Sigma m(1,5,7)$

(2) $E(w, x, y, z) = w'x'y + y'z + xz'$

4. For $f(w, x, y, z) = one\_set(0,1,2,3,5,7,8,10,11,15)$

(1) Find all the prime implicants.

(2) Indicate which of these prime implicants are essential.

(3) Obtain a minimal sum of products for f. Is it unique?

5. Design a minimal two-level NOR network that performs a code conversion from the four-bit binary to the four-bit Gray code. Minimize each output expression separately using K-maps.