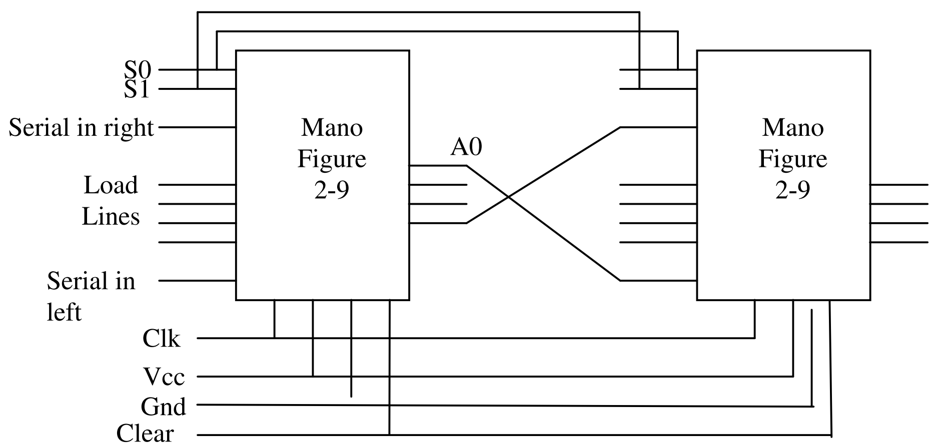
CMSC 311- Computer Organization

Fall 1995 - Assignment #4 (solutions)

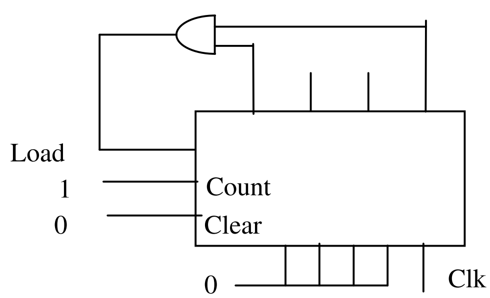
1) Mano 2-12

Input Bits	4 bit register
1	1101
0	1110
1	0111
1	1101
0	0110
1	1011

2) Mano 2-15.



3) Mano 2-18.



3) Convert the following decimal (base 10) numbers to binary:

a) $47=101111_2$

b) $19=10011_2$

c) $255=11111_2$

d) $1024=10000000000_2$

e) $0=0_2$

4) Convert the following hexadecimal numbers to binary and then to octal:

a) 3F2 = $0011\ 1111\ 0010_2 = 1762_8$

b) 77 = $0111\ 0111_2 = 167_8$

c) 3F = $0001\ 0000\ 0001_2 = 0401_8$

d) 101 = $1010_2 = 128_8$

5) Perform the following additions by first converting the decimal numbers to 8-bit two's complement notation, and then adding. If the addition results in an overflow condition (assuming the addends and result are stored in 8-bit registers), indicate that an overflow exists.

a) 0001 1010 + 0010 1101 = 0100 0111

b) 0001 1110 + 0110 0100 = 1000 0010 (overflow)

c) 1101 0111 + 1001 1101 = 0111 0011 (overflow)

d) 1100 1100 + 0010 1101 = 1111 1001

e) 1010 0101 + 0111 0101 = 0001 1010

6) Gray code converter.

B2 = G2
B1 = G1 xor G2
B0 = G1 xor G2 xor G3 .