

UNC Charlotte - ECGR2181 - Homework #6 - Due 3/2/06

Imagine you are creating a system with the following specification:

- Input signals are an eight-bit bus IN, a one-bit line DIRECTION and a one-bit line VALID.
- Output signals are two eight-bit busses A and B, and two one-bit lines A_VALID and B_VALID.
- When VALID is high, route the data present on IN to A or B depending on the value of DIRECTION. If DIRECTION is 0, route IN to A. If DIRECTION is 1, route IN to B. Wherever the data is routed, raise the A_VALID or B_VALID bit to high.
- All output signals should be low if they are not specifically activated. i.e., if VALID is low, all outputs are low. If data is routed from IN to A, then B and B_VALID are low.

Draw a timing diagram showing the input and output signals when the following input is given:

1. IN = x45, VALID = 0, DIRECTION = 0
2. IN = x45, VALID = 1, DIRECTION = 0
3. IN = x45, VALID = 1, DIRECTION = 1
4. IN = x9A, VALID = 0, DIRECTION = 1
5. IN = x9A, VALID = 1, DIRECTION = 0
6. IN = x9A, VALID = 0, DIRECTION = 1
7. IN = x9A, VALID = 1, DIRECTION = 1