# CS2420 Lab 11

Topics: Busses and Memories

Pre Lab: Determine how you could control which of two inputs get to pass through and connect to a single output. Be able to answer the questions in T2 and T3.

T1. Use bus

In class you have seen how to connect devices to a bus and transfer the data from the device to a Register. This technology uses a bus with pull up resistors and open collector NAND gates. Build a simple bus that has 2 devices (hex keyboards) and one register. The only operation is "TRANSFER device i to REGISTER." Below are the bus lines and a schematic diagram of part of the solution. Complete the schematic diagram and demonstrate to the instructor that it works. Transfer data from the devices to the register. YOU are the controller. Have your instructor verify your circuit works and take screen shots for your report.
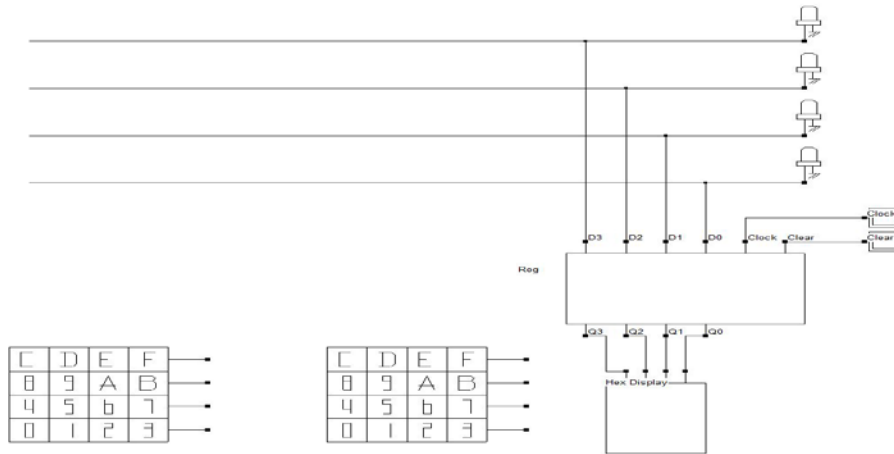
T2. Use RAM

DSCH comes with two memory modules built in: an 8x8 and a 16x16 module. What do those numbers mean? We are going to use the 8x8 module to get an idea of how this works. Using hex keyboards, as both logical address or data values, and hex displays, set up an 8x8 by memory system. Demonstrate it works by performing several WRITEs into the memory followed by several READs from the memory to the instructor. State the order in which the various control and data values must be set and released by the controller (YOU.) Once your instructor has approved your design, take screen shots for your report.

T3. Make another RAM

Repeat T2, except use the 16x16 memory module to create a 4x12 module. For this part we will assume each input pin is a single memory address location. Using only two buttons for inputs, how can we control all four address locations? Once your instructor has verified your circuit, take screen shots for your report.