

Lab Assignment 6

Computer Science 240

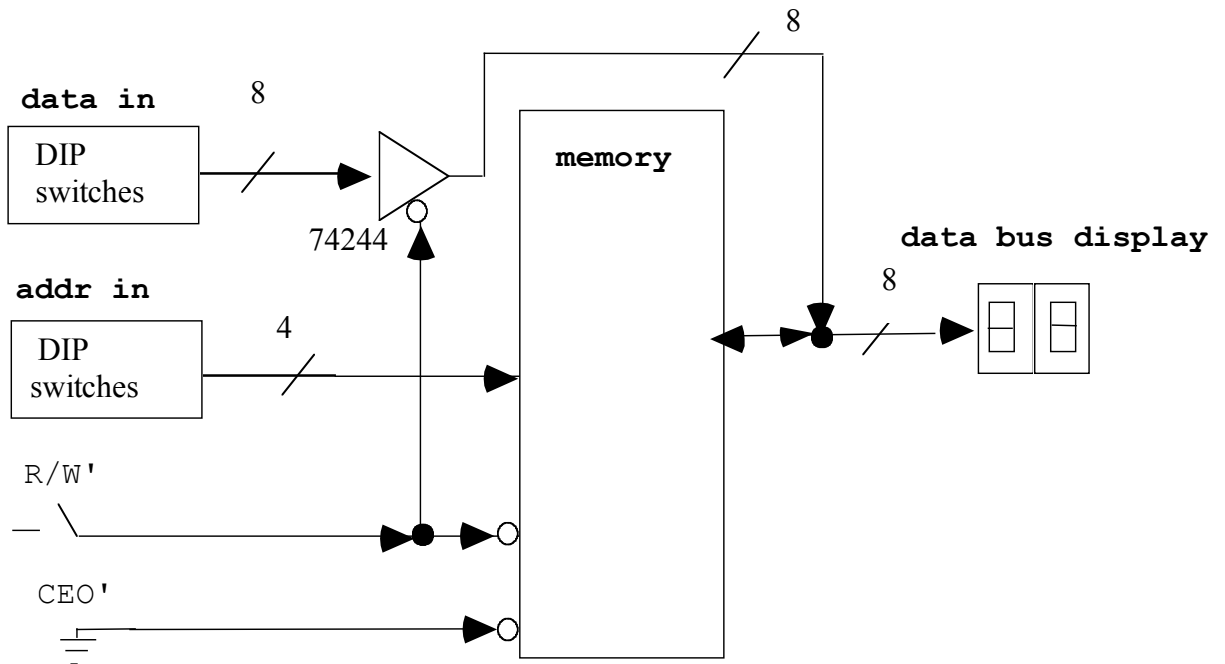
Due: Wednesday, before Lab

At the end of lab last week, you sketched a circuit that used a memory chip and tri-state gates to implement a bi-directional data bus. For this lab assignment, build that circuit using LogicWorks, and investigate its operation.

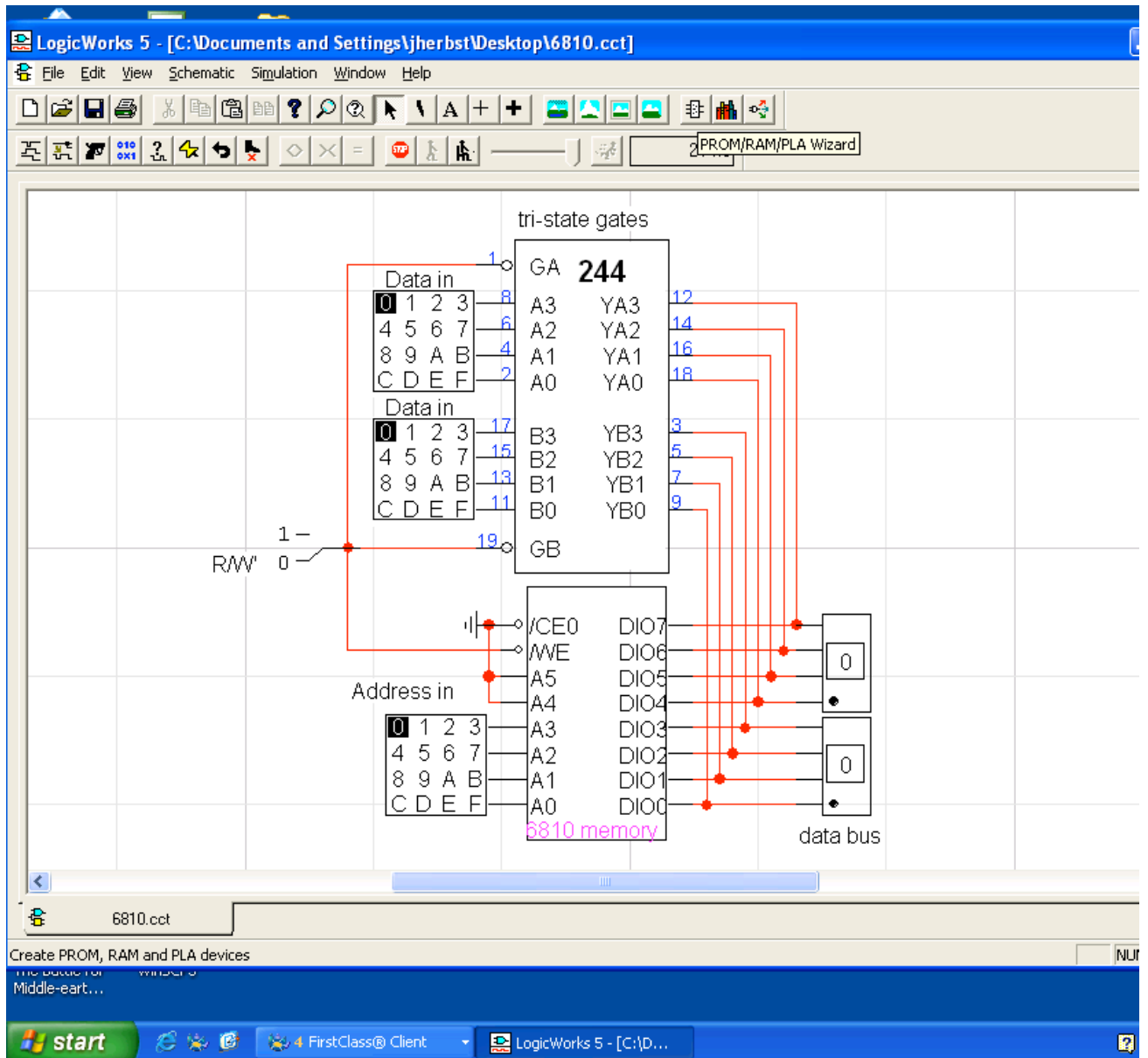
Data Bus

As you learned last week, disconnecting and re-connecting the input and output devices to the memory chip data lines to switch between reading and writing is quite cumbersome. Adding tri-state gates to the memory circuit made it much easier to operate.

Below is a block diagram of the memory circuit with a bi-directional data bus:



Implement the data bus circuit using LogicWorks. Log in to FirstClass. Go to the CS240 folder, and upload the 6810 circuit from the Lab Materials folder to your desktop. Open the circuit. It contains a 6810 memory chip (similar to the one used in lab last week). Use the memory chip to connect your data bus as shown below.



Using the **write** procedure listed below, write the specified data values to addresses 0 - 4:

<u>address</u>	<u>data</u>
0	55
1	99
2	F0
3	FF
4	00

To write to memory:

1. Set the **address in** switches to the location in memory at which you wish to write a data value.
2. Set the **data in** switches to the value you wish to write to that location.
3. Set the R/W' switch to 0, then back to 1.
4. Repeat steps 1 - 3 for each address and its data value.

Using the **read** procedure listed below, read and verify that you correctly performed the write.

To read from memory:

1. Set the **address in** switches to the location in memory at which you wish to read the data stored.
2. Observe the data values stored at that location on the **data bus** display.
3. Repeat steps 1 - 3 for each address to be read.

Email your circuit to me.