

American University of Beirut

ECE312 Lab

MyDAQ Assignment 1

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20110****

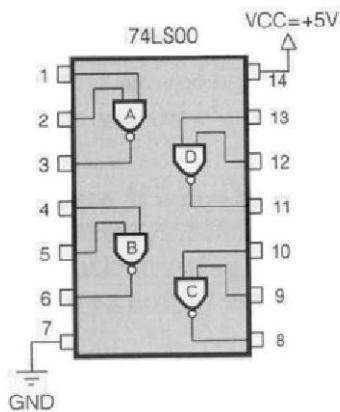
Due on 28/11/2011

1. Description of the hardware setup:

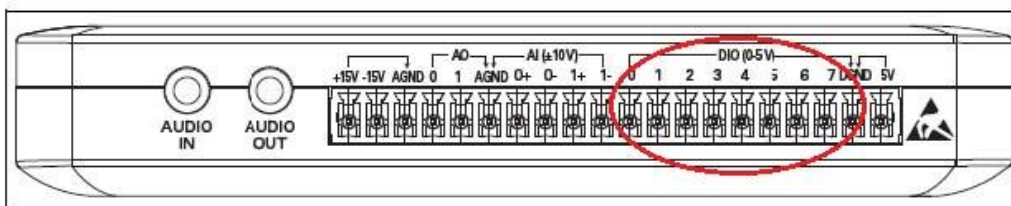
We insert the NAND chip into the breadboard in such a way that each pin of the chip is on a separate node.

The circuit uses 2 NAND gates to generate 1 output from 3 different inputs according to a required logic expression.

We build the circuit on the breadboard using the IC. We need to power the chip used by connecting pins 7 and 14 to ground and VCC (5V) respectively. We use the 5V DC output of the MyDAQ board.

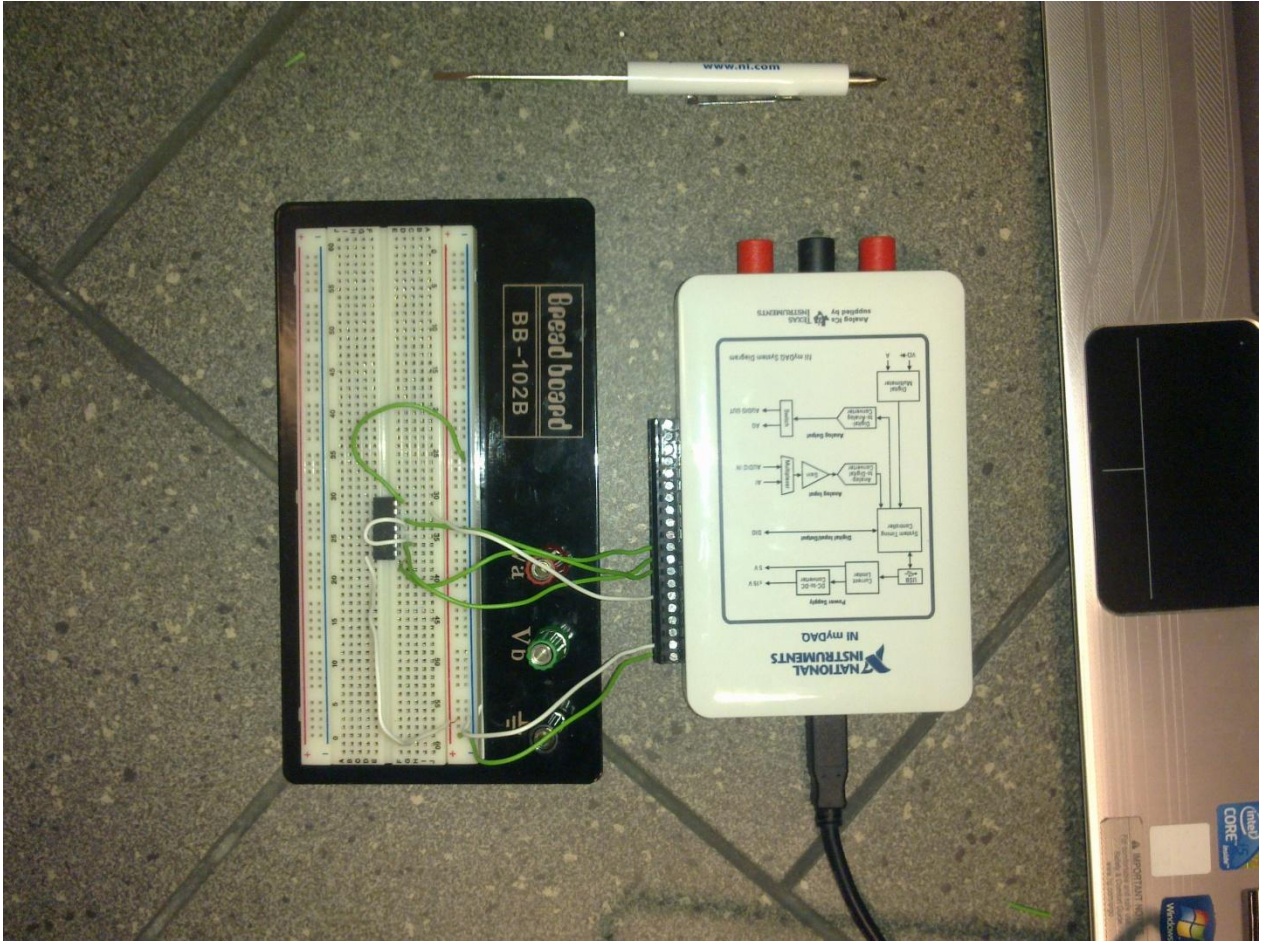


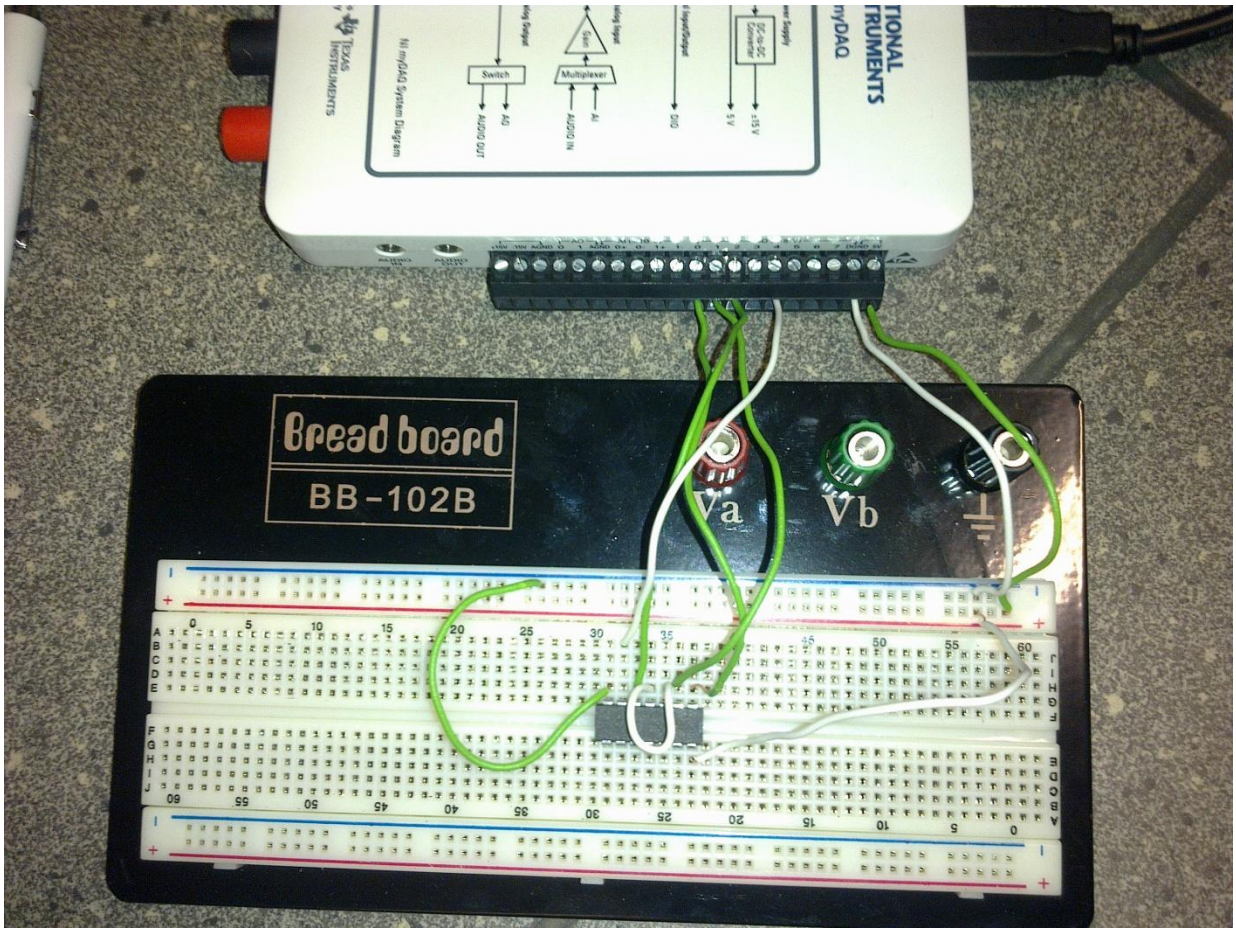
My DAQ has a total of 8 digital I/O (input/output) lines. The user can specify the use of the digital line as input or output by doing correct configuration. The design in this experiment needs 3 inputs and 1 output.

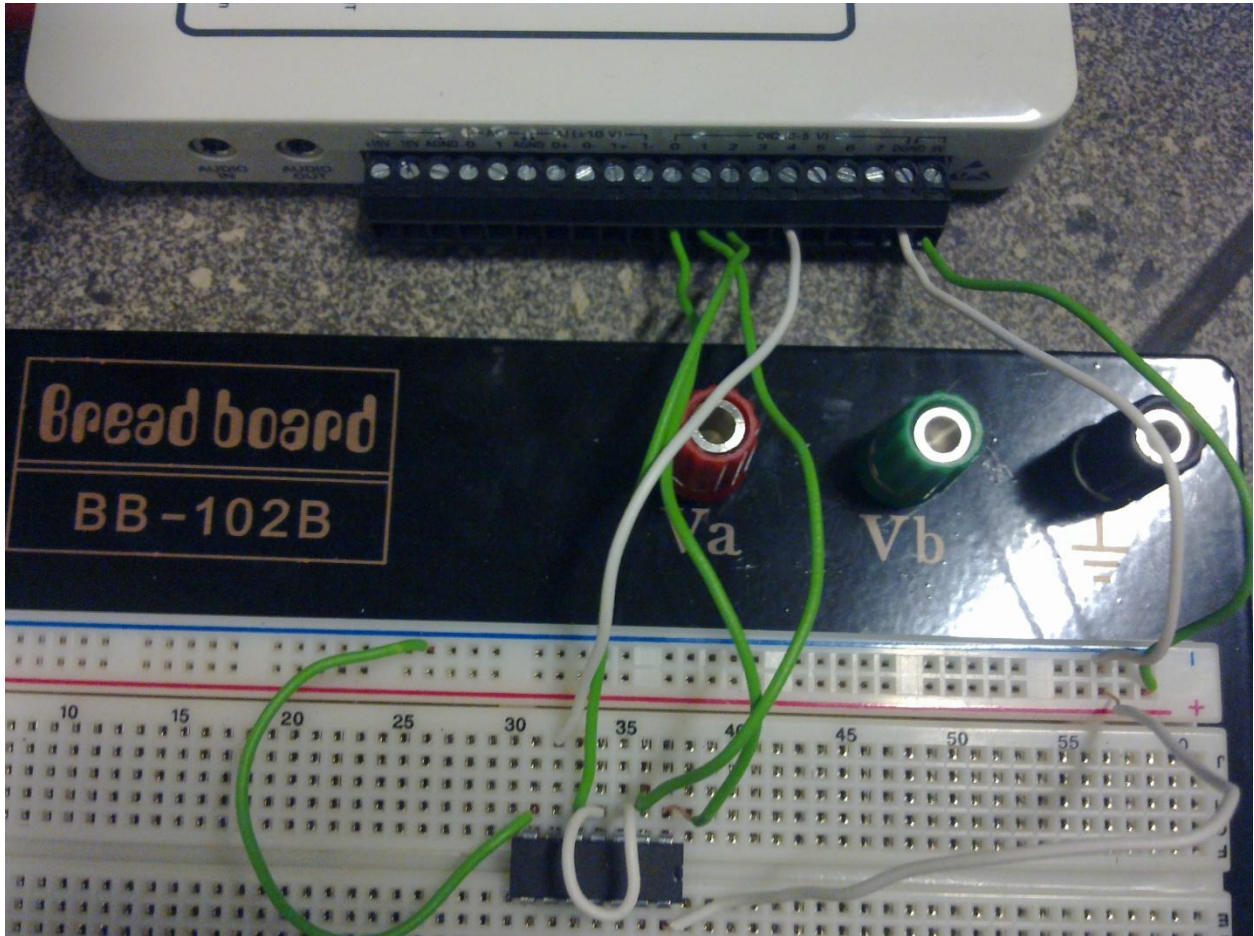


My connections between the MyDAQ and the NAND chip are:

- * DIOs 0, 1, 2 of the MyDAQ to pins 1, 2, 5 of the chip respectively.
- * Pin 3 to pin 4 of the chip.
- * Pin 6 of the chip to DIO 4 of the My DAQ in order to read the Output of our circuit.
- * 5V of MyDAQ to pin 14 (VCC) of the chip.
- * GND MyDAQ to pin 7 (GND) of the chip.



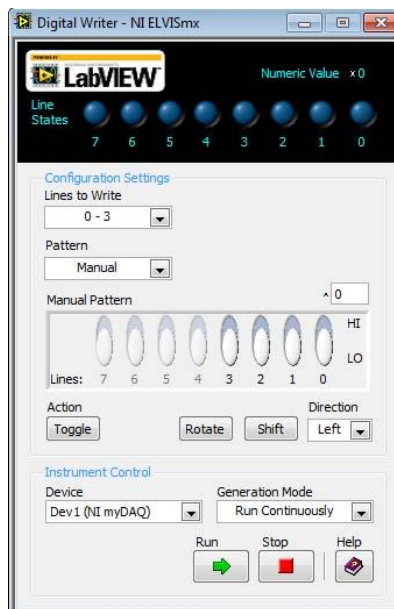




2. Description of the software setup:

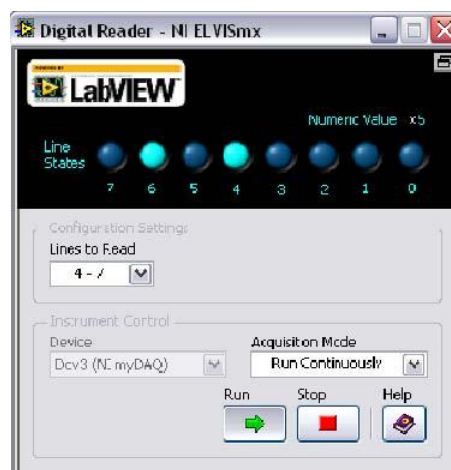
The Digital Writer interface on the computer updates the NI MyDAQ digital output lines with user-specified digital patterns. Hence, digital output lines of MyDAQ will be used as inputs to the circuit design built on the breadboard. This means that at least three digital lines should be configured as output lines from MyDAQ board in order to allow the user to set different input test vectors.

Choosing from the digital writer options lines (0-3) will set the first 4 digital lines (lines 0 to 3) as digital outputs.



The Digital Reader reads digital data from the NI MyDAQ digital input lines. Hence, digital input lines of MyDAQ will be used as outputs from the circuit design built on the breadboard. This means that at least one digital line should be configured as input line to MyDAQ board in order to allow the user to read the output generated from the built circuit.

Since lines 0-3 are configured as digital outputs. We need to configure the other lines as input by choosing from the digital reader options lines (4-7).



We connect the MyDAQ to the PC USB Port. This will automatically provide 5Vout of the designated board output. The instrument launcher will start automatically.



In order to test the circuit we built, we need to apply all the different combinations of inputs and check if the outputs comply with the truth table of the designed circuit. This can be done using DigIn and DigOut modules form the Instrument Launcher.



3. Testing:

Truth Table:

A	B	C	Output
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

