CPE462 - VHDL: Simulation and Synthesis - Fall'11

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Homework Assignment #11

Due Date: Wednesday, October 26th 2011

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Homework policy: If I see something unusual about your work, you can be sure I will ask you about it. If you are unable to explain it to me why you chose some implementation method I will have to consider your entire solution wrong. Now, what is my definition of "unusual work"? Well, things like suspicious parts of code that may have been copied from a website or chunks of your implementation that are very close to one of your colleagues. I really encourage communication amongst yourselves, and I want you guys to have a good time learning while doing these exercises... but please don't blindly copy code. If you really must, at least acknowledge your sources.

1. Construct a circuit capable of comparing two 8-bit vectors, a and b. A selection pin (sel) should determine whether the comparison is signed (sel ='1') or unsigned (sel='0'). The circuit must have three outputs, x1, x2, and x3, corresponding to a > b, a=b, and a < b, respectively. See Figure 1 for a diagram of the proposed circuit.

2. **Extra-Credit:** Figure 2 shows the diagram of a very simple barrel shifter. In this case, the circuit must shift the input vector (of size 8) either 0 or 1 position to the left. When actually shifted (shift=1), the LSB bit must be filled with '0' (shown in the bottom left corner of the diagram). If shift=0, then outp=inp; else, if shift=1, then outp(0)='0' and outp(i)=inp(i + 1), for 1 a i a 7. Write a concurrent code for this circuit.
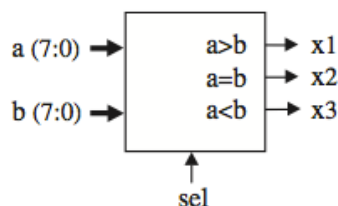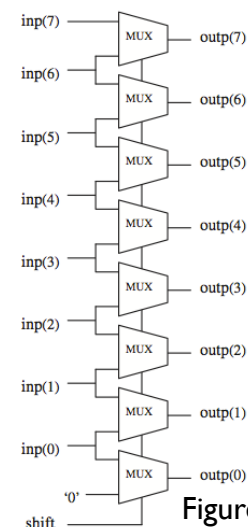

Figure 1

Figure 2