In this recitation, you may help the students with some more advanced combinatorial circuit design:

1. You may ask them to design a 4-bit encoder, which takes four bit inputs and output two bits. If the input bits are 1xxx, the output is 11. If the input bits are 01xx, the output is 10. If the input bits are 001x, the output is 01. If the input bits are 0001, the output is 00.

The answer is

O1 = I3 | I2

O0 = I3 | (~I2 & I1).

2. Assume that X consists of 2 bits, x1 x0, and Y consists of 2 bits, y1 y0. Write a logic function that is true if and only if X < Y, where X and Y are thought of as unsigned binary numbers

The answer is

O = (~x1 & y1) | (~x1&~x0&y0) |(~x0&y1&~y0)

3. Try to get the students familiar with Verilog. All students are supposed to be able to run the simulator, and the instructions are given in HW5.