Homework 3  
EE271  

1: Write out a 4-bit grey code sequence.  

2: Using “natural” binary, represent the following numbers: 5, 17, 31, and 1022.  

3: Write a verilog module that converts a three bit natural binary number into its corresponding grey code value.  

4: Write the following numbers in 2’s Compliment, then invert them (IE turn -4 into +4): -5, 23, -112, 2.  

5: The IEEE 754 standard describes 16-bit floating point as “half precision” floating point. Assuming 5 of the 16 bits are used to represent the exponent (with 00000 representing -14 and 11111 representing +15) what are the largest (highest absolute value) and smallest (closest to zero) numbers that can be represented?  

6: How would changing the number of bits in the exponent to 6 alter the set of available numbers? What is the new largest possible value in this altered scheme?  

Optional Exercise (not graded): design a circuit which adds two 16-bit floating point numbers.  
**Easy mode:** use verilog, keeping in mind it only knows binary and integer math.  
**Hard mode:** draw a schematic.