CE1: Hands-On Computer Engineering

Research Problems 3

1. Make a list of all the things in your room or apartment that most likely have a microprocessor in them. How many did come up with?

2. What does a transistor do? You may wish to focus on the CMOS transistor (what is CMOS?). Use your own words and be very general! (This isn’t EE70!)

3. A CMOS NAND gate has 4 transistors. What does VLSI stand for? How many transistors does a Core 2 Duo or other Intel or AMD processor have? Pick a specific model #, one that is different than what was talked about in class.

4. Figure out what processor is in one of your computers or embedded systems & find something out about it?

5. Truth tables. Consider the problem of using simple logic gates to create a circuit for a three-input majority function. That is, one whose output is "true" (or, for the purposes of this class, “hi”, “1”, “5V”, “Vcc”, or “red”) whenever at least two of the inputs are "true". The first step of designing this circuit is to create a “truth table” of the eight possible input combinations and the single output for each of the eight combinations. Make up such a table. Be sure to put your rows in proper order from 000 to 111.

6. Now draw the “Sum of Products” and “Product of Sums” expressions for your truth table. Which is better?