POST LAB FOR LAB 6

ECEN 350

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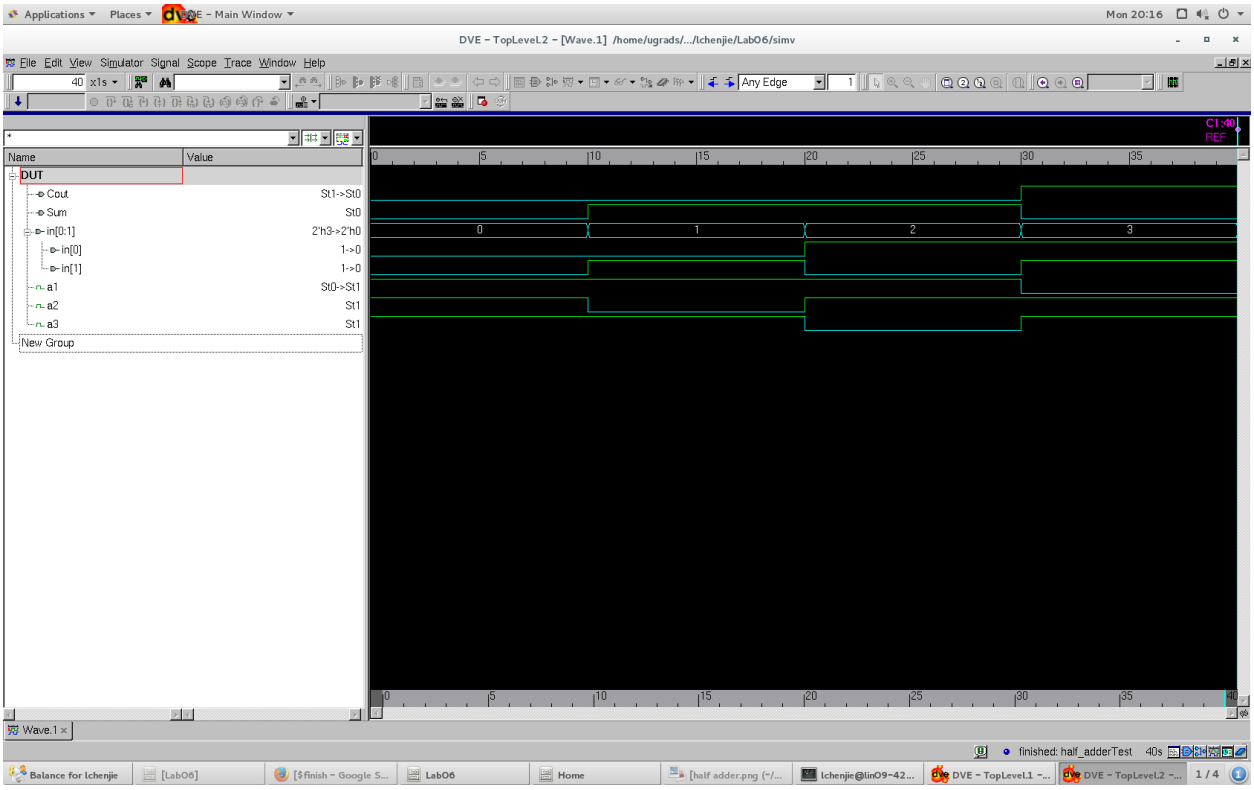
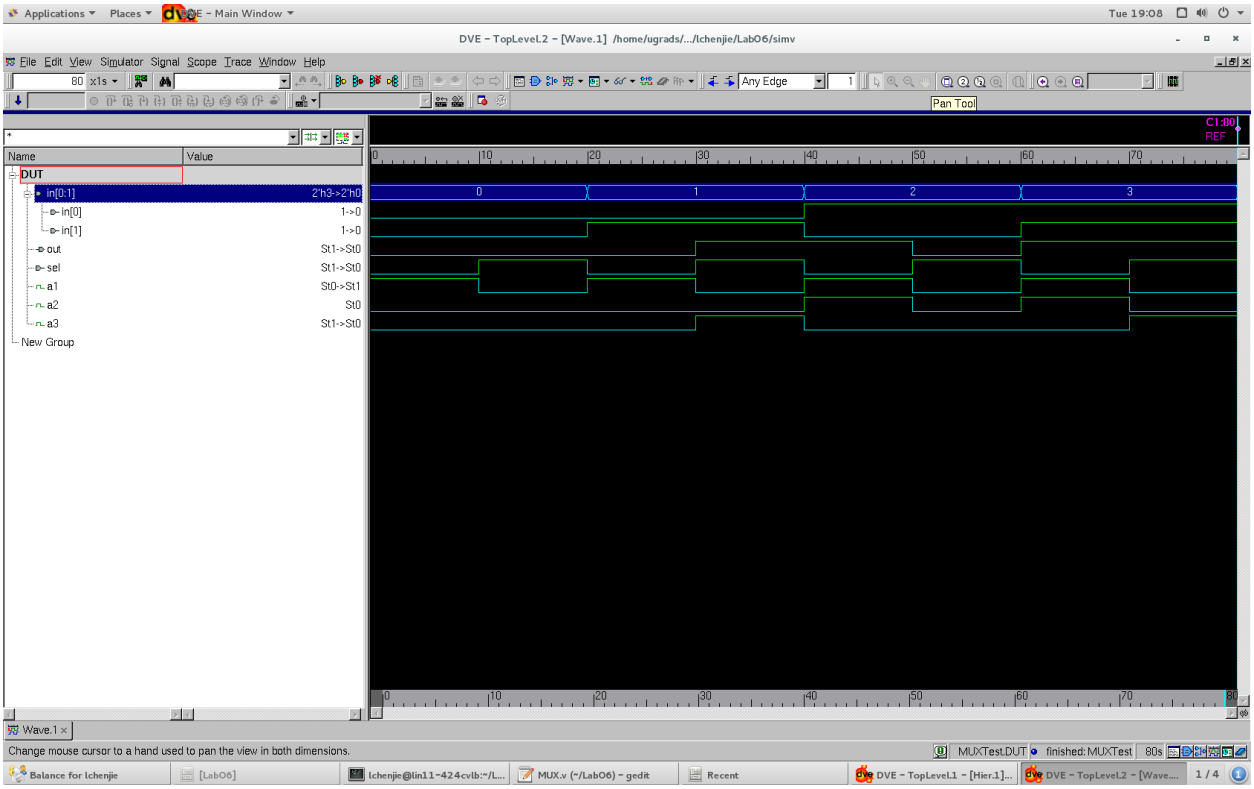
1. Half adder



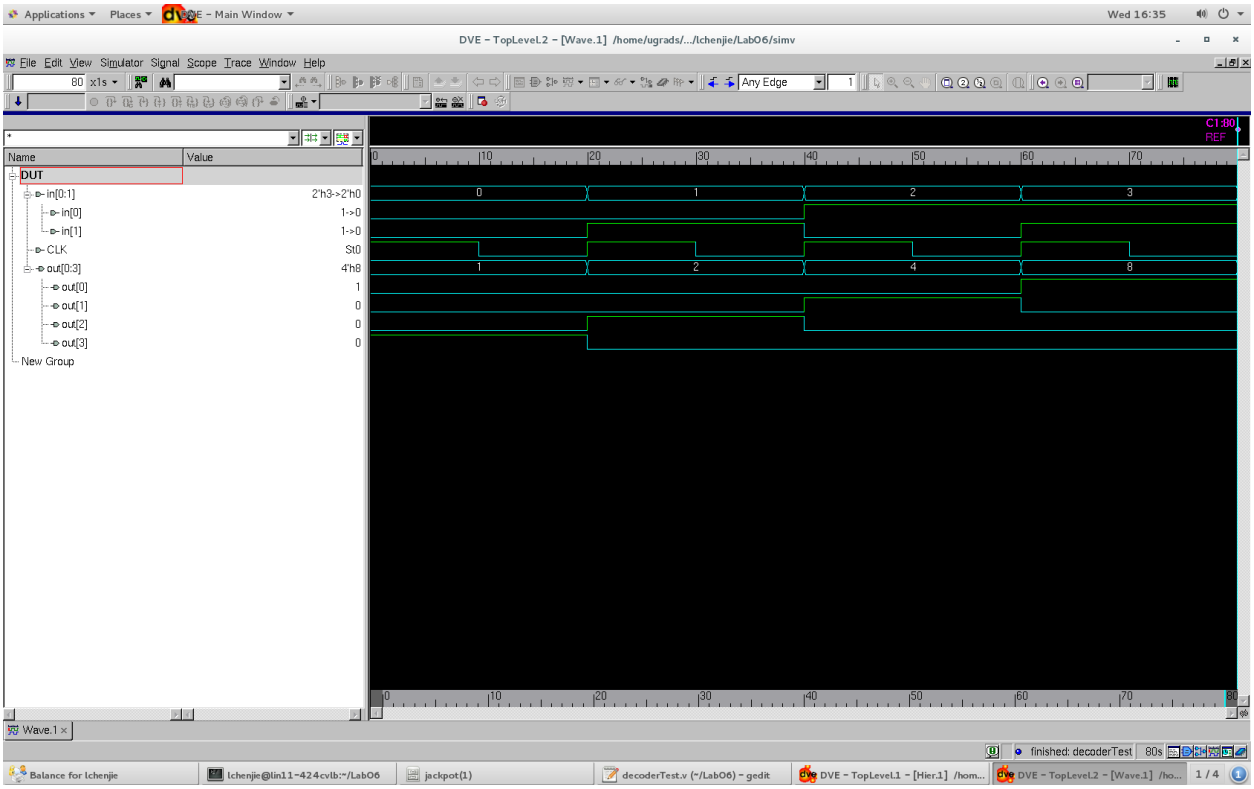
Half adder basically realizes the addition function. The output contains 2 bits. One is Sum, which represent the sum, another one is Cout, which represents the Carry. Using the Boolean algebra, we know: Sum = in[0]⊕in[1]. Because the lab manual requires using NAND gate only, Sum = (((in[0] * in[1])' * in[1]) * ((in[0] * in[1])' * in[0]))' and Cout = ((in[0] * in[1])' * (in[0] * in[1])')'

2. Mux:



Multiplier works as the function: output = in [0] * sel ‘ + in[1] * sel. Basically, it will decide which bit to transfer according to its input sel. For example, when sel is 0, output=in[0]. Similarly, when sel is 1, output=in[1].

3. 2-4 decoder



2-4 decoder works for the function that illustrates which output input is representing. 2 stands for 2 -bit input and 4 stands for 4-bit output. For example, if input = 2'b 00, it means second bit is what input represents so now output is 4'b0001.

Similarly,

input = 2'b01, output = 4'b0010;

input = 2'b10, output = 4'b0100;

input = 2'b11, output = 4'b1000;