Duke University
Department of Physics

Physics 271 Spring Term 2017

WUN2K FOR LECTURE 23

These are notes summarizing the main concepts you need to understand and be able to apply.

- Logic gates can be configured to perform computations on binary numbers. An *half adder* circuit adds two bits X_0 and Y_0, giving a two-bit output C_1Z_0, where C_1 is the carry bit. An *full adder* circuit adds three bits, X_1, Y_1 and C_1 to produce an output C_2Z_2. The implementation of these circuits can be designed using the steps from last lecture (write Boolean statements from a truth table, reduce and "mechanize" with logic gates). Adders can be cascaded together to add numbers with more binary digits.

- A *multiplexer* is a logic device that selectively passes signals from several input data lines to its output according to values encoded on *address* lines. A *demultiplexer* performs the inverse operation, passing input to selected output lines according to the address values.