Chapter 1 Notes – Boolean logic

*Material in this chapter was covered in CS252*

**1.1 Background**

* Boolean = binary / true false
* Truth tables are the simplest way to represent Boolean functions
* Can also be expressed using Boolean expressions – e.g. (x + y)
* **Canonical Representation**
* Every Boolean function can be expressed using canonical expressions
* This is where you examine the truth table, identify function outputs with a one – and OR together inputs such that they are 1
* Thus every function can be expressed using canonical expressions of AND, OR, and NOT gates
* The **NAND** function is special – because all other logical functions can be constructed from it
* Since every function can be expressed in canonical representations, it follows that they can be done with only NAND gates
* This leads to the central idea of the book – NAND2Tetris

Gate Logic

* A **Gate** is a physical device that implements a Boolean function
* Simplest gates are made from *transistors*