CS 2802: Homework 2

January 28, 2019

Handed out Jan. 28; due Feb. 4

- Read Chapter 4; 10.1, 10.2, 10.6, 10.7, 10.10; 8.1 (including 8.1.1-8.1.4). (The rest of Chapter 8 is fun, but not required.)

- Do the following problems:

  - 1.9 (this has a short, cute solution)
  - 4.14
  - 10.31
  - 10.34 (just give one-line answers for each part; no need for proofs)
  - 10.37
  - 10.38 (again, just give one-line answers here)

  and the following extra problems:

  - Extra problem 1: Prove directly that
    (a) $A = (A - B) \cup (A \cap B)$. (Don't worry about going through propositional equivalences, as in the text.)
    (b) If $A \subseteq B$ then $C - B \subseteq C - A$.
  - Extra problem 2: Prove that $\varphi \Rightarrow \psi$ is valid iff the set of truth assignments that make φ true is a subset of the set that makes ψ true. (It follows that φ and ψ are equivalent iff $\varphi \Leftrightarrow \psi$ is valid, although you don't have to explicitly prove this.)
  - Extra problem 3: Prove that equivalence classes are either equal or disjoint.
  - Extra problem 4: Prove that If $S \neq \emptyset$, then there is an injection from S to T iff there is a surjection from T to S.