CS 2802: Homework 2

January 26, 2020

Handed out Jan. 27; due Feb. 3

- Read Chapter 4

- In Chapter 10, read 10.1, 10.2, 10.6, 10.7, 10.10

- In Chapter 8, read 8.1 (including 8.1.1-8.1.4). (The rest of Chapter 8 is fun, but not required.)

- Do the following problems:

    - 4.14

    - 10.31

    - 10.34 (Just give the answer and a short, 1-2 line explanation. No need for a long formal proof.)

    - 10.37

    - 10.38 (again, just give short explanations 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.