

CS 130 Homework 9

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Practice Problems

You are not required to turn these in.

Gersting, 6e: Section 3.3, Exercises 1–5; Section 4.1, Exercises 15–30

Book of Proof: Section 11.0, Exercises 1–9; Section 11.1, Exercises 1–16

Turn-in Problems

We're so close to the wire on this assignment (and your final is on Monday) that I'm going to let you use this time to do your extra credit assignment—the collective practice problems that have been assigned.

However, relations (the topic of this homework) will definitely be on the final, so I need to give you *something* to count for credit for this homework. Therefore, I'll have you turn in your answers to one of the practice problems from Gersting, 6e: problem 30a–e. For your benefit, I've reproduced the problem below.

30. Let ρ be a binary relation on a set S . Then a binary relation called the *inverse* of ρ , denoted by ρ^{-1} , is defined by $x \rho^{-1} y \iff y \rho x$.
- (a) For $\rho = \{(1, 2), (2, 3), (5, 3), (4, 5)\}$ on the set \mathbb{N} , what is ρ^{-1} ?
 - (b) Prove that if ρ is a reflexive relation on a set S , then ρ^{-1} is reflexive.
 - (c) Prove that if ρ is a symmetric relation on a set S , then ρ^{-1} is symmetric.
 - (d) Prove that if ρ is a antisymmetric relation on a set S , then ρ^{-1} is antisymmetric.
 - (e) Prove that if ρ is a transitive relation on a set S , then ρ^{-1} is transitive.