CS22 Proof Virtues

Proof virtues are the qualities of what we consider a good proof in CS22.

1. The proof virtue from which the rest of our proof virtues stem: a good proof makes all members of the CS22 community understand why the claim is true.¹
2. Statements should grounded in concepts and vocabulary that the CS22 community understands.
3. Arguments need to be sound: that is, foundational statements need to be true, and the jumps in the argument need to be logical.
4. Proofs should minimize mental labor from their audience. This involves:
   a. Organization: Breaking your proof into digestible chunks for the reader.
   b. Focus: Proofs should only contain points relevant to the claim. Extraneous information is distracting and should be excluded.
   c. Coherence: The big picture should be clear to the reader.
   d. Signposting: The organization of argument should be explained to the reader. It should always be clear to the reader from the proof where the author is in the big picture.
   e. Striking a balance between concision and thoroughness: Be concise but thorough, and be thorough but not verbose.
   f. Providing motivation: Examples and diagrams should often be provided to motivate your argument.

¹ Perhaps you’re thinking… how could I possibly know if my proof appeals to ALL members of the CS22 community? You’re right; you can’t! However, a good way to estimate whether your argument appeals to the entire CS22 community is by working with a diverse subsets of individuals from it. This is one of the reasons why we encourage you to work with folks in the class who are different from you on your assignments.