The ability to deal with abstraction is one of the most important intellectual skills any computer scientist can have. It requires the ability to think clearly, to formulate precise definitions, and to reason logically in terms of those definitions. Do not worry if you have had only limited experience with this; you will gain plenty in this course. One of our chief purposes is to cultivate this skill and hone it to a razor-sharp edge.

Accordingly, we will hold you to a high standard of rigor in the presentation of your homework solutions. When justifying an answer, you do not need to be overly verbose. Just make sure your argument is logically sound from start to finish and that you include enough information so that we can follow all the steps in your reasoning. For instance, including step-by-step justifications such as "by the definition of . . . " is a very good idea. Such explanations are brief, but still demonstrate that your solution is based on a solid understanding.

You should take as much care composing your solutions as you would composing an essay for an English course. A common mistake is to write down a sequence of statements without making clear the chain of thought connecting them. An isolated statement can be an assumption, a conclusion, a definition, or a proof goal; it is often difficult to determine what you mean if you do not say explicitly. Even if our familiarity with the solution enables us to infer your intended meaning, you may still lose points if your presentation is not sufficiently clear.

Here are some tips to avoid these problems. Write in complete English sentences. Use abbreviations and symbols sparingly, and avoid mixing them with English text. Use arrows for propositional implication only in displayed equations. Define all nonstandard notation. Exploit the power of definition; ascribing a name to a concept, a symbol to a complicated expression, or a label to an equation makes it easy to refer to. Reread your solutions while asking yourself: Could a fellow student make sense of it? Is the argument presented in a concise and efficient way?

Students often ask whether "show" means the same thing as "prove." The answer is yes. So do "demonstrate," "argue," "justify," and a half dozen other synonyms. Unless otherwise noted, all these expressions mean "prove formally."