Ethics, Privacy, and Authentication

These exercises are intended to help you master and remember the material discussed in lectures and explored in labs. In future semesters, we may make some or all of these exercises required, but for now they remain optional. We suggest that you do them as we go over the material, but you may also want to use them to review concepts before the exam.

We suggest that you use this version rather than the version without solutions to solve the problems before looking at the version with solutions. Many studies have shown that people often trick themselves into believing that they know how to solve a problem if they are presented with the answer before they try to solve the problem themselves.

1. [L16] Some international high schools (and standardized testing services!) have started to use artificial intelligence for grading. Explain two drawbacks of such an approach relative to human-based grading. *(Hint: what if you submit a correct but never-before-seen answer to this question?)*

2. [L16] Have you ever been in a situation in which another human incorrectly allowed a computer's output or answer to override their own understanding or intuition? Explain. *If not, imagine such a scenario.*

3. [L16] Due to the ubiquitous availability of calculators, elementary schools have reduced their emphasis on basic arithmetic. Are a calculator's answers always, correct? Explain.

4. [L16] If cost were not an issue, would you pay a company to record several views of your home, including your bedroom and bathrooms, 24/7 (24 hours a day, 7 days a week—in other words, at all times)? Assume that the company is not allowed to sell or distribute the recordings—they are just providing you with protection by capturing any intruders to your home. Explain your answer.

5. [L17] A lawyer claims that because a document contains a date and the document (including the date) has been hashed with SHA, the fact that the SHA hash can be checked proves that the document's date is correct. As a student of ECE101, explain the lawyer's error.

6. [L17] Explain why symmetric keys are not useful when trying to verify that a particular person authored a document.