

## Lab 3

For this lab you may work individually or with a single partner. If you work with a partner you must identify your partner in your submission. You must each either write by hand or type up and format your answers independently (rather than submitting duplicate copies of the same document).

Please refer to the syllabus for submission guidelines (neatly hand-written is acceptable for this assignment). It is better to communicate **clearly, thoughtfully, and completely** than to be in a hurry.

Ask questions if you need help or clarification on any of these.

1. Why should classes have names in the singular? Do you think there are any exceptions?
2. An object models a combination lock. What properties should this object have? What type is associated with each of these properties? What queries should the object support? What commands?
3. For each of the following objects, list some potential properties that the object might contain. Also list at least one query for each, and the type of value the query returns. Finally list at least one command (if the object is mutable) and which properties the command modifies.
  - a. An object modeling a classroom in a class scheduling program.
  - b. An object modeling a book in a library catalog.
  - c. An object modeling a backpack in a retail store inventory system.
  - d. An object modeling a player's backpack in a video game.
  - e. An object modeling an elevator in a simulation.
4. For each of the following applications, suggest some objects that might be included in the system design. Give one or two responsibilities that might be assigned to each object.
  - a. Your favorite computer game (make sure to tell me the name of the game).
  - b. A program modeling traffic flow on major thoroughfares in a city.
  - c. An inventory control system for a hardware store.
  - d. A program controlling a vending machine.
  - e. A university registration system.
  - f. A program that translates English into French.
  - g. A program for recording and manipulating genealogical data.