CMSC 143: Introduction to Object-Oriented Programming with Robots
Lab 7: Analyzing Data
Due March 17, 2010

In this lab we will analyze the data from our recent midterm exam. The data is available as a file named `midterm.txt` on moodle. You will need to write python functions to 1) read the data from the file 2) compute statistics 3) build and 4) visualize a histogram of the data. Submit a copy of your python program (cmsc143_lab7_NAME.py) on moodle. Your program should have your name, email, and the date at the top of the file as a comment.

Learning Objectives

∘ Read Data from Files.   ∘ Compute Statistics.   ∘ Use Dictionaries.   ∘ Graph Data.

Loading the Data

`loadGrades(fname)` should read a file of grades (one student per line; each section separated by commas) and return a list of the total grades as floats.

EXTRA: Add a parameter `section` that selects just one section to be processed.

Computing Statistics

`computeMin(grades)`, `computeMax(grades)`, `computeMean(grades)`, `computeMode(grades)` take a list of grades and return the appropriate statistic. Report the min, max, mean and mode of the data (total score).

EXTRA: Compute the statistics for the individual sections.

Build a Histogram

Write `buildHistogram(grades)` which takes a list of grades and returns a dictionary representing a histogram of the grades. Use the standard (90-100: A, 80-89: B, 70-79: C, 60-69: D, < 60: F). For example:

```
# buildHistogram(grades)
{'D': 4, 'C': 2, 'B': 4, 'A': 5}
```

EXTRA: Build histograms for the individual sections in addition to the overall grade.

Visualizing the Data

`plotHistogram(histogram)` should draw the histogram from the previous section. For example: