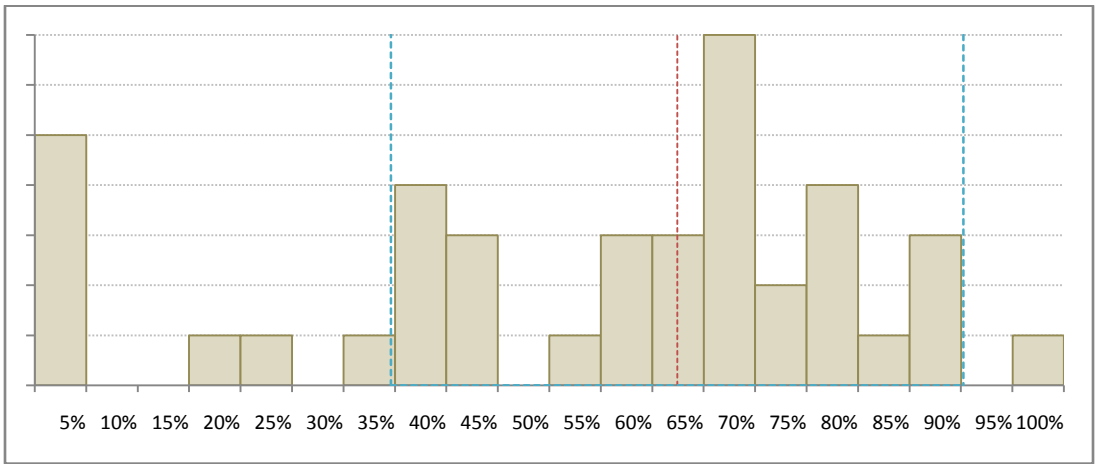
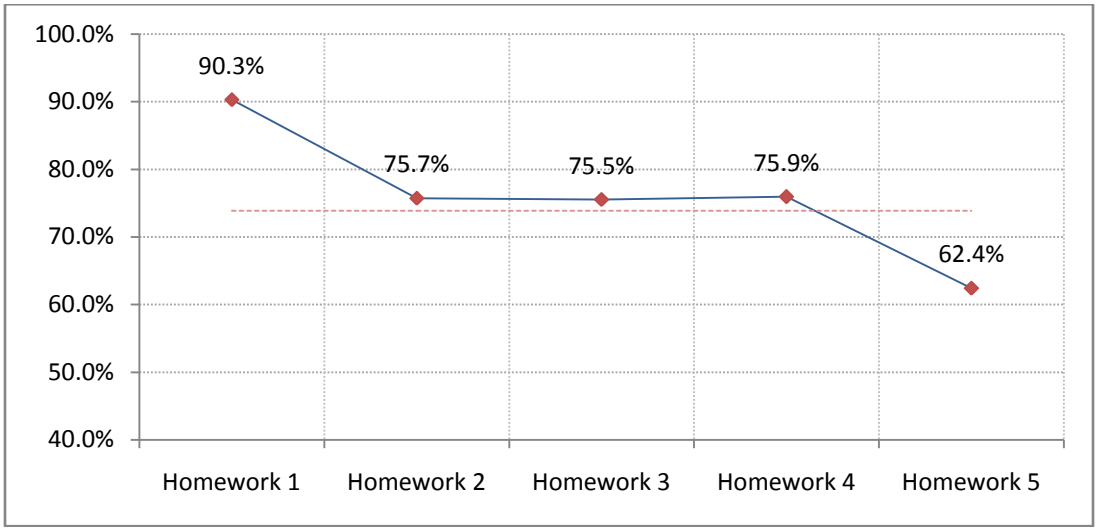
ECS120 INTRODUCTION TO THE THEORY OF COMPUTATION
FALL QUARTER 2007

TA Grading Notes
Homework 5

Problems 2 (b and c), 3, 4, and 5 were graded for a total of 40 points. The homework average was about 62.4% (not counting missing homework). The following is a histogram of the homework grades:



The red line is the homework average, and the teal lines represent one standard deviation below and above the average. The homework averages for this and all previous homework looks like:



Again, the red line gives the overall homework average.

Grading Notes

Any CFGs or PDAs provided were tested in JFLAP.

Problem 2

When providing example languages L_1 and L_2 for part (b) and (c), you had to show the languages were context-free (unless they were already proven to be in the book or in class).

Problem 3

To show a language is context-free, you must provide a representation of that language using CFGs or PDAs and then show that your representation is *correct*. (This was required for regular languages in the past; proofs here have the same requirements!) To show that your CFG or PDA represents your language, you need to argue that:

- Show that $L(G) \subseteq D$ by arguing that if $w \in L(G)$ then $w \in D$.
- Show that $D \subseteq L(G)$ by arguing that if $w \in D$ then $w \in L(G)$.

Alternatively, you could use some closure properties to prove the language was context-free.

Problem 4

This problem asked you to convert a context-free grammar into Chomsky normal form using the procedure from the book. You had to show work for each step of the procedure, and have the grammar produced by following each step. Most of the points for this problem were awarded for following the steps in the procedure.

Problem 5

You had to provide a PDA for this problem. If it did not match the solution exactly, it was tested against numerous strings in JFLAP.