SI 413 Fall 2012: Homework 1

Your name:

Due: Friday, 24 August, before class

Instructions: Review the course honor policy for written homeworks.

This cover sheet must be the front page of what you hand in. Fill out the left column in the table to the right after we go over each problem in class, according to the rubric below.

This rubric is also on the website, in more detail, under "Other Stuff"→"Grading Rubrics".

Make sure all problems are submitted IN ORDER.

- **5**: Solution is completely correct, concisely presented, and neatly written.
- **4**: The solution is mostly correct, but one or two minor details were missed, or the presentation could be more concise.
- **3**: The main idea is correct, but there are some significant mistakes. The presentation is somewhat sloppy or confused.
- **2**: A complete effort was made, but the result is mostly incorrect. There may be some basic misunderstandings of the topic or the problem.
- **1**: The beginning of an attempt was made, but the work is clearly incomplete.
- **0**: Not submitted.

Problem	Self-assessment	Final assessment
1		
2		
3		
4		

Comments or suggestions about this homework:

Comments or suggestions about the course so far:

Citations (other students, websites, . . .):

1 Comparing and Contrasting Languages

List the programming languages you have used in the past, and for each one name some distinguishing characteristics. Think about why anyone would choose one language over another. What features does it have? What niche does it fill?

2 Symbol Table

What role does the symbol table play in compliation? What information is stored in it?

3 Reversible Compilation?

For each of these main steps in the compilation process, explain whether that step is always reversible. For example, the scanning phase reads in source code and produces a token stream. Is it always possible to reverse this process and produce the original source code from the token stream? Briefly explain why or why not.

a) Scanning (source code to token stream)

b) Parsing (token stream to parse tree)

c) Semantic analysis (parse tree to abstract syntax tree)

d) Code generation (AST to machine code)

4 Errors

Give an example of Java code that generates each of the following kinds of errors:

a) Syntax error detected by the scanner

b) Syntax error detected by the parser

c) Static semantic error, detected at compile time

d) Dynamic semantic error, detected at run tme