Assignment 7
(**Due date: Thursday, 4/16/2009, in class**)

Your name:	Grade:

The following questions are taken from the textbook Chapter 8 (p. 272-277).
Important notice on how to submit and grade this assignment:

- Write your solutions on **different papers** from the question papers; otherwise, they will NOT be graded.
- You do NOT have to write the question text. You must **write the question number** for each question.
- Put your solutions in the **same order** as the questions appear on the assignment; otherwise, missed/misplaced solutions will NOT be graded.
- **For questions 1 through 29, using A, B, C, D, E, or F as your answers** for each of these questions (you may write text solutions alongside these A, B, …F). 50% will be deducted if your solutions are NOT one of these A, B, …F (even though your texts give the correct answers).
- **An extra 10% will be given to those who turned in TYPEWRITTEN submissions).**

For Exercises 1–14, match the question with **A, B, C,** or **D** (the appropriate translation or execution system).

A. Interpreter
B. Assembler
C. Compiler
D. Machine code

1. What translates a high-level language into machine code?

2. What translates a Java program into Bytecode?

3. What executes Bytecode?

4. What translates an assembly-language program?

5. What is the output of an assembler?

6. What takes input in a high-level language and directs the computer to perform the actions specified in each statement?

8. What is used to translate a program in ALGOL?

9. What is used to translate a program in APL?

10. What is used to translate a program in COBOL?

11. What is used to translate a program in FORTRAN?

12. What is used to translate a program in Lisp?

13. What is used to translate a program in SNOBOL4?

14. Which translator runs the slowest?

For Exercises 15–36, match the language paradigm and the language or the language description.

A. Imperative or procedural
B. Functional
C. Logic
D. Object oriented
E. Procedural language with some object-oriented features
F. Object-oriented language with some procedural features

15. Which paradigm most accurately describes FORTRAN?

16. Which paradigm most accurately describes C++?

17. Which paradigm most accurately describes PASCAL?

18. Which paradigm most accurately describes Java?

19. Which paradigm most accurately describes Lisp?

20. Which paradigm most accurately describes BASIC?

21. Which paradigm most accurately describes PROLOG?

22. Which paradigm most accurately describes SIMULA?

23. Which paradigm most accurately describes ALGOL?

24. Which paradigm most accurately describes ML?

25. Which paradigm most accurately describes Scheme?

26. Which paradigm most accurately describes Ada?

27. Which paradigm most accurately describes C?

28. Which paradigm most accurately describes Smalltalk?

29. The dominant languages used in industry throughout the history of computing software come from which paradigm?

38. Distinguish between an assembler and a compiler.

39. Distinguish between a compiler and an interpreter.

40. Compare and contrast an assembler, a compiler, and an interpreter.

41. Describe the portability provided by a compiler.

42. Describe the portability provided by the use of Bytecode.

43. Describe the process of compiling and running a Java program.

46. What are the characteristics of the imperative paradigm?

47. What are the characteristics of the functional paradigm?

48. What are the characteristics of the logic paradigm?

49. How does the view of an object-oriented program differ from the view of an imperative program?

57. What is a data type? Provide four data types that are common in programming languages.

83 (not from the textbook). What is declarative programming language (check http://en.wikipedia.org/wiki/Declarative_programming)?

84 (not from the textbook). What is a variable?

85 (not from the textbook). What is a constant?

86 (not from the textbook). Give examples (outside of computer science) of each of the following structures: list, stack, queue, and tree.

87 (not from the textbook). Summarize the distinction between lists, stacks, and queues .

88 (not from the textbook). Suppose the letter A is pushed onto an empty stack, followed by the letters B and C, in that order. Then suppose that a letter is popped off the stack and the letters D and E are pushed on. List the letters that would be on the stack in the order they would appear from top to bottom. If a letter is popped off the stack, which letter will be retrieved?

89 (not from the textbook). Suppose the letter A is placed in an empty queue, followed the letters B and C, in that order. Then suppose that a letter is removed from the queue and the letters D and E are inserted. List the letters that would be in the queue in the order they would appear from head to tail. If a letter is now removed from the queue, which letter will it be?

90 (not from the textbook). Suppose a tree has four nodes A, B, C, and D. if A and C are siblings and D's parent is A, which nodes are leaf nodes? Which node is the root ?