Quiz 4
**(Due dates: (1) for 100% + 15%bonus: 12/10/2008/Wednesday, in class
(2) for 100%: 12/17/2008/Wednesday
(3) for 0%: after 12/17/2008/Wednesday**)

Your name:	Date:

Provide brief answers to the following questions (you may check the textbook Section Questions & Exercises for solutions to some of the questions in the **textbook chapters**, read the textbook and lecture slides for other questions):

1. How do you define Artificial Intelligence (check McCarthy's and Wiki's websites)?

2. Briefly describe the following AI research branches (check McCarthy's and Wiki's):

      a.   Logical AI

      b.   Knowledge Representation

c. (Machine) Learning

d. Expert System

3. Briefly explain how heuristic algorithm works by using the following eight-puzzle example (11.3.6).

1	2	3
4		8
7	6	5

4. How does AI define mundane tasks and expert tasks? Give one example for each of them.

5. The following IF-THEN rules are proposed for a simple rule-based financial advice expert system:

- R1: IF NOT savings-adequate THEN ADD invest_savings

- R2: IF invest_savings AND income_adequate THEN ADD invest_stocks

- R3: IF has_children THEN ADD NOT savings_adequate

- R4: IF has_partner AND partner_has_job THEN ADD income_adequate

For the hypothesis *invest_stocks* outline how this could be proved through **(a) backward and (b) forward chaining**. Assume that current facts include: *has_children, has_partner* and *partner_has_job*.

6. Give a definition of Database.

7. What is DBMS? Summarize the roles of the application software and a DBMS (9.1.3).

The following is Figure 9.5 from the textbook.

EMPLOYEE relation

Empl Id	Name	Address	SSN
25X15	Joe E. Baker	33 Nowhere St.	111223333
34Y70	Cheryl H. Clark	563 Downtown Ave.	999009999
23Y34	G. Jerry Smith	1555 Circle Dr.	111005555

JOB relation

Job Id	JobTitle	Skill Code	Dept
S25X	Secretary	T5	Personnel
S26Z	Secretary	T6	Accounting
F5	Floor manager	FM3	Sales
•	•	•	•
•	•	•	•
•	•	•	•

ASSIGNMENT relation

Empl Id	Job Id	Start Date	Term Date
23Y34	S25X	3-1-1999	4-30-2006
34Y70	F5	10-1-2007	*
23Y34	S26Z	5-1-2006	*
•	•	•	•
•	•	•	•
•	•	•	•

8. Answer the following questions based on the partial information given in the EMPLOYEE, JOB, and ASSIGNMENT relations in Figure 9.5 (available from the lecture slides) (9.2.1):
    a. Who is the secretary in the accounting department with experience in the personnel department?
    b. Who is the floor manager in the sales department?
    c. What job does G. Jerry Smith currently hold?

9. Based on the EMPLOYEE, JOB, and ASSIGNMENT relations in Figure 9.5 (available from the lecture slides), write an SQL instruction to obtain a list of all job titles within the personnel department (9.2.2 and 9.2.4).

10. Based on the EMPLOYEE, JOB, and ASSIGNMENT relations in Figure 9.5 (available from the lecture slides), write an SQL instruction to obtain a list of employee names along with the employee's departments (9.2.3 and 9.2.4).

11. Provide an operational definition for computers.

12. The computer has played different roles in our life. What are they? Give an example for each of them.

13. Briefly describe the ACM/IEEE code of ethics.

14. Give some examples of computer crime. Discuss how to prevent computer crimes.

15. What is BNF? What is EBNF? Explain why and how the following personal mailing address is an example of US-Post-Address BNF defined by the following diagram?

        John Smith Jr.
        352 Lafayette Street
        Salem, MA 01970

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<postal-address> ::= <name-part> <street-address> <zip-part>

    <name-part> ::= <personal-part> <last-name> <opt-jr-part> <EOL>
                  | <personal-part> <name-part>

 <personal-part> ::= <first-name> | <initial> "."

<street-address> ::= <opt-apt-num> <house-num> <street-name> <EOL>

      <zip-part> ::= <town-name> "," <state-code> <ZIP-code> <EOL>

   <opt-jr-part> ::= "Sr." | "Jr." | <roman-numeral> | ""
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======================**Important Notes**==========================
- Homework can be hand-written or typewritten.
- Put all your solutions in the same order as the above questions.
- Use this question paper as **cover page and staple them together**.