CS0601 Introduction to Artificial Intelligence

**Week 21**

**Expert Systems Part 2: rule-based reasoning**

**Part A: Multiple Choices**

1. What is the technique of establishing the facts from the knowledge base of an expert system to prove a given goal?

A. Knowledge representation

B. Forward chaining

C. Reuse of code

D. Backward chaining

2. In a rule-based expert system, the domain knowledge is represented by

A. a set of IF-THEN production rules

B. a set of facts about the current situation

C. a set of program code

D. a set of recorded information (e.g. sound/video/words)

3. In a rule-based expert system, the main difference between a database and a knowledge base is that

A. a databased contains numbers and a knowledge base contains words

B. a databased contains facts and a knowledge base contains rules

C. a databased contains objects and a knowledge base contains variables

D. a databased contains data and a knowledge base contains information

4. Which is the following is true?

A. Forward chaining is the event-driven reasoning.

B. Forward chaining is the time-driven chaining

C. Forward chaining is the direction-driven reasoning.

D. Forward chaining is the data-driven reasoning.

5. Which is the following is true?

A. Any rule can be executed for more than once.

B. Some rule can be executed once only

C. All rules must be executed at least once

D. Any rule can be executed only once

6. Forward chaining is a technique for gathering information and then

A. going forward to find where the chain is

B. understand the direction of the supplying chain

C. inferring from it whatever can be inferred.

D. proving the hypothesis you have made.

7. Which is the following is true?

A. Backward chaining is the time-driven process.

B. Backward chaining is the batch-processing reasoning.

C. Backward chaining is the event-driven process.

D. Backward chaining is the goal-driven reasoning.

8. The order of the rules is

A. not important in an expert system.

B. vitally important in an expert system.

C. a key index of the performance of an expert system.

D. sometimes necessary for the execution of an expert system.

9. In an expert system, metaknowledge is knowledge about

A. the use and control of domain knowledge

B. the volume of domain knowledge

C. the width and depth of domain knowledge

D. acquisition, representation and retrieval of domain knowledge

10. In an expert system, the knowledge and its processing are

A. linked

B. cascaded

C. separated

D. coupled

**Part B: Fill-in-the-blank/Short-answer Questions**

1. The inference engine compares each \_\_\_\_rules\_\_\_ stored in the knowledge base with \_\_\_facts\_\_\_\_ contained in the database.

2. When the IF (condition) part of the rule matches a fact, the rule is \_\_\_fired\_\_\_\_ and its THEN (action) part is \_\_executed\_\_\_\_\_.

3. In the forward chaining, each time only the \_\_topmost\_\_\_\_\_ rule is executed. When fired, the rule adds a new \_\_fact\_\_\_\_\_ in the database. The match-fire cycle \_\_stops\_\_\_\_\_ when no further rules can be fired.

4. An inference engine backchains by determining the highest \_\_\_priorty\_\_\_\_ goal from user \_\_spifiations\_\_\_\_\_, then asking questions about rules in order to find a rule or rules that lead to \_\_ the goal\_\_\_\_\_.

**Part C: General Format Questions**

1. We can use forward chaining to go from premises to goal. Briefly discuss the problem with forward chaining.

* The consequences are experienced after the goal is achieved
* In forward chaining, many rules may be executed that have nothing

2. Give a real-world example for the backward chaining.

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3. How do you choose between forward and backward chaining?

4. In an expert system, one method used for conflict resolution is to fire the rule with the highest priority. List other two methods and explain the way these methods work.