Exam Knowledge-based Systems
March 28, 2007
15:15 – 18:00 h

This exam consists of 3 assignments on 2 pages.

Credits:

1a	1b	1c	1d	1e	1f	1g	1h	2a	2b	2c	2d	3a	3b	3c
4	6	8	3	6	8	5	5	5	2	4	8	5	6	9

Total credits = 84

Read all questions carefully and make sure that you answer all elements of the questions (for example, do not forget to give an explanation or an example if asked for it). Good luck!

Assignment 1: Classification of companies

A large bank uses a classification system to classify companies in 5 different categories of "financial credibility". Credible companies, with few debts and a high turnover, do get loans more easily than less credible companies. More than 100 different criteria are used to determine the credibility of companies.

The revenues and turnover of a company can be represented in many different ways. In this system, the revenues and turnover is always recalculated to a specific standard representation.

a) How do you call it when some knowledge is always translated to a standard representation?

b) Give an advantage and a disadvantage of this approach.

When describing knowledge-based systems a distinction is made between the symbol-level and the knowledge-level.

c) Explain the symbol-level and explain the knowledge-level.

d) Which level is concerned with the choice of question 1a?

The bank chose to implement this system with a rule-based system. There are two reasoning directions in such systems: forward and backward.

e) Explain which direction is the best choice for this system, and why (read the description above carefully again).

Unfortunately, there are quite some uncertain factors when determining the credibility of companies.

f) Give the names of the two techniques for coping with uncertainty that have been explained during the course and describe them in a few sentences.

g) Which technique would you choose to apply in this rule-based system? Explain why!

Both techniques allow saying something about the certainty of specific facts.

h) Explain the difference between the meaning of the statements "P(A) = 0" (one technique) and "CF(A) = 0" (other technique).

Assignment 2: Speedboat repair

The owner of a speedboat repair shop realizes that he can't finish all his work. He employed several people, but they do not have much experience with speedboat repair. He wants to build a knowledge-based system that helps his employees to repair speedboats without much knowledge and experience.

a) What is the name of the (standard) task that this system performs?

At this point, he already identified the problem and went through the conceptualization step.

b) What is the next phase in building the knowledge-based system?

c) Describes what happens in that next phase.

d) Describe the 3 different search spaces that can be distinguished in the task of speedboat repair, and draw/sketch and describe the transitions between de different search spaces.

Assignment 3: Configuration of mobile phones

Almost all mobile phones are produced via "configuration" nowadays.

a) Explain why this is economically beneficial for the producer.

b) Describe the notion of configuration according to its definition.

c) Give 3 different types of knowledge that are required for a configuration task and give an example of each of these types in the domain of mobile phones production.

End of exam.