Universität des Saarlandes
Fachrichtung 6.2 – Informatik
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1st Theoretical Assignment in Artificial Intelligence (SS 2005)

Issued: April 25, 2005 Due: May 2, 2005

– Homepage AI: www.ags.uni-sb.de/~omega/teach/KI05/ –

Note: This assignment requires you to discuss your answers. Each discussion should take between 3 and 10 lines.

Exercise 1.1: **10 P**

1. Define the concept *machine*. (5 P)
2. Use this definition to discuss whether human beings can be considered as machines. (5 P)

Exercise 1.2: **20 P**

1. Do you think that a pile of stones and toilet paper can think? (4 P)
2. Briefly discuss whether computers can think. (8 P)
3. Weizenbaum (*Computer Power and Human Reason*, Chapter 2, 1976) has shown how to build a computer from stones and toilet paper. Does this change your answers to 1 and 2? Discuss your answer. (8 P)

Exercise 1.3: **10 P**

Briefly discuss the four different forms of agents illustrated in the lecture. For each type, specify **one** example from the animal kingdom. Name the abilities of the particular type and the problems it can/cannot solve. Can you imagine other forms of agents? Show advantages of this *new* form of agent.

Exercise 1.4: **10 P**

Consider the following rows of numbers.

$$R_1 : 1$$

$$R_2 : 11$$

$$R_3 : 21$$

$$R_4 : 1211$$

$$R_5 : 111221$$

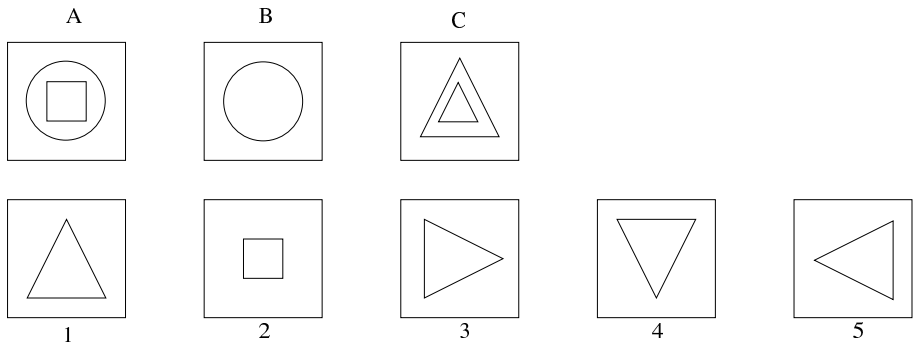
Specify in natural language a single rule that allows to get from R_i to R_{i+1}. How does R_6 look like? (Hint: You do not need to apply complex mathematical operations)

Exercise 1.5: **20 P**

1. What is a *Turing test*? (5 P)
2. Give five questions you would ask in a Turing test. Discuss why you pick these questions. (10 P)
3. Discuss whether the Turing test is appropriate to decide if computers can think. (5 P)

Exercise 1.6: **30 P**

Consider the following analogy test:



1. Give a symbolic representation for each of the figures A-C, 1-5. (10 P)

   What kind of problems do you encounter when applying the technique presented in the lecture

   (a) to specify the single objects? (5 P)

   (b) to specify the relations? (5 P)

2. Give a symbolic specifications for each of the following transformations

   $A \rightarrow B, C \rightarrow 1, \ldots, C \rightarrow 5$. (5 P)

3. Generalise the symbolic specifications for each pair of transformation rules

   $(A \rightarrow B, C \rightarrow 1), \ldots, (A \rightarrow B, C \rightarrow 5)$

   Which figure do you obtain using the schema described in the lecture? Which figure would you have chosen? (5 P)