

## AI midterm exam, 2012. Oct. 26., 12-14

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A/1. What are the properties of bidirectional search? What is a necessary condition for its application? (5p)

A/2. What is the Turing test? Why is it difficult to formalize common sense knowledge (5p)

A/3. What does it mean that predicate logic is a first-order logic? Give an example for a higher-order logic. What are the practical consequences that first-order logic is semi-decidable? (5p)

A/4. Adam, Betty, and Chris played and a window got broken. Adam says: 'Betty made, Chris is innocent.' Betty says: 'If Adam is guilty, then Chris too'. Chris says: 'I am innocent; someone else did it'.

Is it possible that none of them is lying? If they are telling the truth, who broke the window? Answer these questions with truth table method using the following notation:

- A: Adam is innocent.
- B: Betty is innocent.
- C: Chris is innocent. (15p)

A/5. The **CESARE syllogism** is as follows:

$$\forall x. B(x) \rightarrow \neg A(x)$$

$$\forall x. C(x) \rightarrow A(x)$$

$$\forall x. C(x) \rightarrow \neg B(x)$$

Prove it with resolution! (15p)

A/6. Apply A\* and construct the search tree for the problem below. Costs are indicated on the edges, the heuristic function is indicated within the nodes. (15p)

