Questionario di Agenti Intelligenti (English)

2^ Parziale 28 Giugno 2010

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Name, Surname……. Code……

EVALUATION CRITERIA

The test has the following structure:

- 6 close questions, 2 points each (total 12 points), 0 points if no answer;
- 2 open questions, 4 points each (total 8 points), -2 points each if the answer is omitted or heavily inadequate. per
- 2 exercises, 5 points each (total 10 points), -3 points each if the solution is omette or heavily inadeguate.

For open questions, correctness and completeness of the answer are of course relevant to the evaluation. However, preciseness, also in terminology, will be evaluated.
Each exercise must be completely developed and explained (just providing the result is not accepted). Evaluation will depend upon correctness, completeness and fulfillment of requirements.

Answers and solutions should be written on the enclosed sheets of paper (use also the reverse in case of lack of space). Please make sure that your handwriting is understandable.

You are expected to complete the test within 1 hour and 45 minutes

1.In default reasoning, an explanation D of fact G in theory F is such that:

a) (F |=/= G) Ù (F È D |= G) Ù (F È D |=/= false);

b) (F È G |= D) Ù (F È G |=/= false);

c) (F È D |=/= G) Ù (F È D |=/= false).

2.Conyesdering:

1. Theory:
   {*amusing(X):- movie(X), assume_amusing(X). movie(hollywood_party).}*
2. Fact: *amusing(hollywood_party)*
3. singleton set of facts:*{assume_amusing(hollywood_party)}*

indicate their role in a default theory, i.e., which is F, which is D and which is G.

3.In abductive event-calculus, expression *rains* can be:

1. an abducibile;
2. a fluent;
3. an initiation/termination condition of some event.

4.The form of learning in which an agent receives a "reward" in case learned knowledge proves to be useful is called:

a. supervised learning;
b. unsupervised learning;
c. reainforcement learning.

5.In KGP, the control component of the agent is:

1. fixed;
2. can be interchanged to influence the agent behavior;

6.Given the internal state of a KGP agent, of the form: <KB, F, C, S>, say what is F.

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7.**A** Shortly describe how to buid a decision tree. Explain how to choose the attributes to associate to nodes, possibly discussing how the choice is affected by entropy or, equivalently, information gain.

8.**A** Talk about the KGP model.

9.**E.** Build a Default reasoning theory stating that: normally, if I like something and I have money I buy it; normally, I like electronic gadgets; playstation is an electronic gadget; MP3 player is an electronic gadget; I have money; I don't like playstation; I don't buy something if I don't like it, even in case of electronic gadgets. Introduce suitable normality assumptions and exploit integrity constraints.

buy(X):- like(X),have_money,normlike(X).

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like(X):- electronic_gadget(X), normlike(X).
electronic_gadget(X):- playstation(X).
electronic_gadget(X):- mp3(X).
have_money.
:- playstation(X),normlike(X).
:- buy(X), not like(X).
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10.**E** The following training examples concern the decision about whether to play tennis or not (**Play** = yes/no), based upon various parameters, namely season, weather (**Season** = Summer/Winter, **Weather** = good/bad), temperature and wind (**Temperature** = unconfortable/confortable, **Wind** = light/strong). Build a decision tree that correctly classifies the examples. Take in mind that every leaf corresponds to a decision and that every example must be decided upon. There cannot be duplicate nodes. In case more than one attribute might be chosen to build a node, explain which one you choose and why.

Es.	**Season**	**Weather**	**Wind**	**Temperature**	**Play**
E1	summer	good	light	unconfortable	no
E2	winter	bad	light	unconfortable	no
E3	winter	bad	light	confortable	no
E4	summer	good	light	confortable	yes
E5	summer	good	strong	confortable	no
E6	summer	bad	light	confortable	no
E7	summer	bad	strong	unconfortable	no
E8	winter	bad	strong	unconfortable	no
E9	winter	good	light	confortable	yes
E10	summer	good	light	unconfortable	no
E11	winter	good	light	unconfortable	yes
E12	winter	good	strong	unconfortable	no