

## CS 6100 Homework 1 10 points

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Note, these exercises may be done in groups of one, two, or three. If more than one person is involved, list all the names on ONE set of answers. Groups may change throughout the term. *Working in groups is a BIG plus for you. Take advantage of it. If you work in groups, you must work in the group for the ENTIRE assignment. It is considered cheating if you work with someone else for some of the answers, but turn in an individual copy of the answers. It is an all or nothing situation. You can't work together on some questions and alone on some. Sometimes I see an individual whose name is listed in two groups. This is strictly forbidden and is considered cheating. You cannot work in two groups.*

1. The term "agent" in the context of computer systems has no universally accepted meaning - the term is usually defined by listing attributes that it claimed an agent has. Briefly describe what you understand to be the most commonly mentioned attributes of agency.
2. Agents are related but distinct from objects. Explain the distinction between the two concepts.
3. One possible technique for programming agents in a game with a human player is to direct the agent to reproduce the actions of the user controlled player. Is this consistent with agent principles? Explain.
4. In programming Wumpus World, in what ways is your agent reactive? In what ways is your agent pro-active?
5. Characterize the Mars Explorer problem (from the notes) in terms of the following environmental descriptors:
  - a. accessible vs inaccessible
  - b. episodic (temporary or one-shot) vs non-episodic (history sensitive)
  - c. static vs dynamic
  - d. deterministic vs non-deterministic
  - e. discrete vs continuous
6. The text uses the term *social-ability* to describe agents. This means agents
  - a. have well established rules of etiquette
  - b. agents can communicate with one another using a high-level language
  - c. agents model real people
  - d. agents exhibit honesty, reliability, and persistence
7. A system whose behavior can be predicted by the method of attributing belief, desires, and rationality is termed
  - a. human centered
  - b. intentional
  - c. emotional
  - d. pro-active
8. Wooldridge uses the following notation for a state transformer function  $\tau:R^{Ac} \rightarrow \wp(E)$ . He uses this notation to indicate
  - a.  $\tau$  is a non-deterministic mapping, rather than a function
  - b. actions are history dependent
  - c. actions affect the environment
  - d. all of the above
9. When  $\tau(r) = \emptyset$ , we know
  - a. there are no possible successor states to  $r$
  - b. a single action is appropriate
  - c. the agent is in the initial state

d. the transformer function is illegal

10. Explain how utilities could be used to motivate agent actions in the Wumpus World scenario.

11. Utilities can be cardinal, ordinal, or binary. Explain the advantages and disadvantages of each.