STS 350

Exam #2

Name _____

Friday, March 24
100 pts.

Good Old Fashioned AI

Symbolic AI, or good old-fashioned AI (GOFAI) is characterized by the commitment to the physical symbol system hypothesis (PSSH).

2.   (10 pts.)   What is a physical symbol system (informally)?

3.   (10 pts.)   State the physical symbol system hypothesis. What is meant by 'necessary' and 'sufficient' in the statement?

(GOF)AI = KR (knowledge representation) + Search. Newell and Simon remark on the importance of heuristic search in their Turing award paper.

We begin by recalling some definitions:

4.   (5 pts. each) Give brief definitions of each of the following terms related to using search in problem-solving. It might help to use one of our examples (for example, the wine-pouring puzzle) for illustrations, but please give general definitions.

state

operator

precondition

(problem 4 continued)
       postcondition

       heuristic

Search can be divided into **uninformed** search and **informed** (heuristic) search. Uninformed search generally comes in two varieties: depth-first and breadth-first search.

5.   (15 pts.) You are sitting at your desk in your room and suddenly realize that you have lost your keys and that you need to find them. Give a brief description of breadth-first search, and say how it would apply to your efforts to find your keys.

6.   (5 pts. - continuation of the previous problem) You suddenly remember that you tend to put your keys down shortly after you enter your room, and that it makes sense to look for them in the direction of the door. This gives a preference to a particular direction in your search. What sort of tool is this?

On the second level of Marr's three levels of explanation of an information processing system, we have algorithms and representations. In symbolic AI, representations are in the form of knowledge representation schemes.

7.   (10 pts.)   What is a frame? As an example, how might one use a frame to describe a student at the University?

8.   (10 pts.)   What is a script? By way of an example, describe the restaurant script.

9. (15 pts.) Briefly describe how knowledge can be stored in productions (rules, condition-action pairs) in an expert system. Describe what an expert system is and provide a brief sketch.