SCXT 350

Exam #2

Name _____

Friday, March 25
100 pts.

The story so far

In exploring the idea that intelligent activity, language, cognition, perception and the like is computational in nature, we have started to look at approaches to building computational implementations of intelligent actions. This gives rise to the field of **artificial intelligence (AI)**.

1. (10 points) Give a brief definition of AI, listing a few of the problems that work in this field attempts to solve.

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?

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

4. (15 pts.) Suppose that we have a finite state automaton with four states (numbered 1 – 4) and three inputs (A, B, and C):

State \ input	A	B	C
1	2	Error	Error
2	2	3	Error
3	Error	Error	4
4	Error	Error	4

State 1 is the starting state, and state 4 is the final state.

a. Sketch the automaton in the manner done in class and in the homework.

b. Explain why the string AABCC is accepted (list the states through which the automaton passes), and why the string ABBC is not.

5. (10 pts.) Give a brief description of a Turing Machine.

6. (5 pts.) What is the Turing-Church hypothesis?

(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:

5. (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

   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.

6. (15 pts.) You are in the center of a labyrinth with a (very long) ball of string (which will help you to back up to a branch in the labyrinth if you hit a dead end). Give a brief description of depth-first search, and say how it would apply to your efforts to escape the labyrinth.

7. (5 pts.) One aid in escaping a labyrinth is to follow the left-hand wall. What sort of aid is this? What names do we give to rules like this?