COEN 166 Artificial Intelligence

Homework #1 Solution

Problem 1: Define in your own words the following terms: agent, agent function, agent program, performance measure, rational agent.

Answer:

<u>Agent:</u> An entity that perceives its environment through sensors and acts upon that environment through actuators.

<u>Agent function:</u> It's the mathematical description of mapping any given percept sequence to an action.

<u>Agent program:</u> It's the concrete implementation of the agent function.

<u>Performance measure:</u> It's an objective criterion for success of an agent's behavior.

<u>Rational agent:</u> For each possible percept sequence, a rational agent is the agent that selects an action that maximizes its performance measure, given the evidence provided by the percept sequence and whatever built-in knowledge the agent has.

Problem 2: Give the task environment description of the following scenarios (Fully observable vs. partially observable? Deterministic vs. stochastic/strategic? Episodic vs. sequential? Static vs. dynamic/semi-dynamic? Discrete vs continuous? Single-agent vs. multi-agents?)

a. Taxi driving.

   Answer: Partially observable, stochastic, sequential, dynamic, continuous, multi-agent.

b. Playing soccer.

   Answer: Partially observable, stochastic, sequential (episodic is also fine), dynamic, continuous, multi-agent.

c. Backgammon.

   Answer: Fully observable, Stochastic, Sequential, Static, Discrete, Multi-agent.