

Exercícios do Cap. 2, Russell and Norvig, 3rd ed., 2009.

2.3 For each of the following assertions, say whether it is true or false and support your answer with examples or counterexamples where appropriate.

- a. An agent that senses only partial information about the state cannot be perfectly rational.
- b. There exist task environments in which no pure reflex agent can behave rationally.
- c. There exists a task environment in which every agent is rational.
- d. The input to an agent program is the same as the input to the agent function.
- e. Every agent function is implementable by some program/machine combination.
- f. Suppose an agent selects its action uniformly at random from the set of possible actions. There exists a deterministic task environment in which this agent is rational.
- g. It is possible for a given agent to be perfectly rational in two distinct task environments.
- h. Every agent is rational in an unobservable environment.
- i. A perfectly rational poker-playing agent never loses.

2.4 For each of the following activities, give a PEAS description of the task environment and characterize it in terms of the properties listed in Section 2.3.2.

- Playing soccer.
- Exploring the subsurface oceans of Titan.
- Shopping for used AI books on the Internet.
- Playing a tennis match.
- Practicing tennis against a wall.
- Performing a high jump.
- Knitting a sweater.
- Bidding on an item at an auction.

2.5 Define in your own words the following terms: agent, agent function, agent program, rationality, autonomy, reflex agent, model-based agent, goal-based agent, utility-based agent, learning agent.