

**Artificial Intelligence
Homework 1
For Sept. 8**

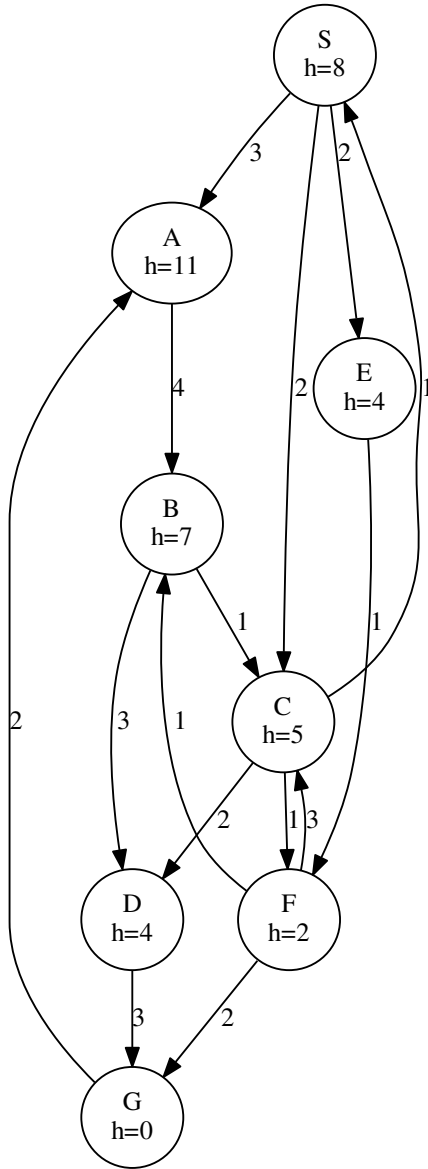
1. True/False with explanation. Explain each of your answers
 - (a) An agent that only perceives partial information cannot be rational. **F**
 - (b) There exists a task environment where a simple reflex agent can act rationally. **T**
 - (c) A perfectly rational poker agent always wins. **F**
 - (d) Every value-based agent is a goal-based agent. **T**

2. For each of the following task environments determine its characteristics: observable, agents, deterministic, episodic, static, discrete.
 - (a) Crossing the street
partially observable, multi-agent, non-deterministic, sequential, dynamic, continuous
 - (b) Solving a Sudoku puzzle
fully observable, single-agent, deterministic, sequential, static, discrete
 - (c) Playing rock-paper-scissors (or rock-paper-scissors-lizard-Spock)
fully observable, multi-agent, stochastic, episodic, static, discrete

3. Consider the following graph. Consider trying to get from node S to node G. The labels on the edges are the costs for going along that edge and the values at each vertex are their heuristics. Find the order that the nodes are expanded for each of the search strategies.

Note: there is not a single answer, I'm assuming children are expanded in alphabetical order.

 - (a) Depth first search **SABCDGFE**
 - (b) Breadth first search **SACEBDFG**
 - (c) Uniform cost search **SCEAFDGB**
 - (d) Best first search **SEFG**
 - (e) A* search **SEFG**



4. Is the heuristic in the previous problem admissible? Consistent? Explain. **Not admissible, not consistent**