Quiz1

1. How would you characterize the task environment of self-driving?
   1. Continuous, static, deterministic, sequential, multi-agent, partially observed
   2. Discrete, dynamic, deterministic, sequential, multi-agent, partially observed
   3. Continuous, dynamic, stochastic, sequential, single-agent, fully observed
   4. Continuous, dynamic, stochastic, sequential, multi-agent, partially observed

Answer: Since the environment is continuously changing it is dynamic. There is interaction with other agents and their actions have stochasticity as well as the environments stochasticity. The task space cannot be discretized hence it is continuous and finally, not everything about the environment can be observed at all times.

1. AI has been informed by foundational research in a range of domains. List two domains that it has borrowed from, and two ideas from each that have caught your attention.

Answer: any strong points pertaining to the relevant section from Lecture 1 should qualify for this.

1. What is the goal of rational action in AI?
   1. Maximize the expected gain
   2. Operate autonomously, sense the environment, create, adapt and pursue goals
   3. Produce algorithms that embody creativity
   4. Execute programs that replicate human behaviours
   5. Implement algorithms that are fair, enabling AI to behave ethically

Answer: c, d, and e are in some sense secondary goals but the primary goals of rational action are to be able to autonomously operate in environments and maximising the expected gain from an action towards achieving a goal.

1. Why is it necessary to characterize a task environment? How does it aid an agent?

Answer: characterising an environment allows a user to select better algorithm suited specifically for operating within those parameters and gives the agent a better chance at achieving the goal.

1. Can a real-world environment be described accurately with only one or two descriptors? Mention an environment that needs to be described by multiple descriptors to be characterized accurately.

Answer: Most environments need to be described with multiple descriptors as they characterise different properties of the environment. E.g., chess is a discrete environment, but it is not enough to describe it simply as that. The fact that it is also a multi-agent environment adds to the complexity of achieving the goal. It is also a fully-observable, sequential, and stochastic.

1. How is the performance of an agent measured?

Answer: How well the agent is doing is measure by:

* 1. Has the agent reached the goal state?
  2. Has the agent received the most rewards along the way?
  3. Has the agent arrived at goal without injury to self or others?

1. What are the components that an AI agent uses to interact with its environment?

Answer: actuators and sensors

1. An AI agent can only take a decision/action when it has complete understanding/certainty of the environment and task at hand.
   1. True
   2. False

Answer: AI agents can make decisions based on partial knowledge or limited rationality, if there is sufficient information to make a probabilistically good decision.

1. PEAS in the task environment is \_\_\_\_\_\_\_\_
   1. Performance, Environment, Actuator, Sensor
   2. Perceive, Environment, Actuator, Store
   3. Performance, Evaluate, Adapt, Sensor
   4. Perceive, Evaluate, Actuator, Store
2. What are the different reference models for building/creating AI? Tie this in with McCarthy's alternate title for the field of AI.

Answer:

* Human Thoughts
* Human Actions
* Rational Thoughts
* Rational Actions

John McCarthy wanted to name the area of enquiry Computational Rationality instead of Artificial Intelligence.