CSE 518 - Homework 2 Solutions

2.1 - An agent perceives its environment through sensors and acts via actuators.

The environment is everything external to the agent that it interacts with.

Examples: self driving car, chess program.

2.2 - Evolution shapes priors and innate mechanisms across generations.

Autonomy and intelligence can arise as evolved capacities for decision making.

Learning provides within lifetime plasticity.

2.3 - PEAS for taxi driving: Performance safety timely arrival comfort fuel efficiency.

Environment: road network, traffic, weather, pedestrians.

Actuators: steering, throttle, brakes, indicators.

Sensors: GPS, cameras, lidar, radar, speedometer, passenger inputs.

2.4 - Classic vacuum world with deterministic actions and exact sensors is deterministic and fully observab

It can be episodic or sequential and may be static or dynamic.

2.5 - Agent types: simple reflex, model based reflex, goal based, utility based, learning agents.

2.6 - Rational vacuum agent: maintain map, clean if dirty, else move to nearest known dirty.

2.7 - Use belief states and update with observations; explore or use POMDP planning.

2.8 - BFS optimal memory heavy, DFS low memory may miss shortest paths, A star with admissible heuris

2.9 - Unknown geography: map and frontier based exploration; TD often learns faster than sample averag

2.10 - Passive learning evaluates a fixed policy. Direct utility estimation averages returns and is slower. TD