National University of Singapore
School of Computing
CS3243 Introduction to AI

Tutorial 1: Introduction to AI & Basic Search

Issued: January 23, 2020 Due: Week 3 Tutorial (28th Jan. - 1st Feb.)

1. Consider an online social media platform that incorporates a "People You May Know" feature: it recommends to a user a list of people that they may know, in order to incentivize them to expand their social network (and as a result make them spend more time on the platform). We discuss this system (called PYMK for short) as a *learning agent*, implementing a utility maximizing action choice.

   (a) What elements would you incorporate into the system's `state` and `action` space?

   (b) What kind of utility function would PYMK implement? What does it try to maximize?

   (c) What feedback does it get from the users?

   (d) How would it learn? What kind of exploration actions would it take?

   (e) What information does such a system use? What information should it *not* use?

2. In the framework of Chapter 2, what is the difference between a performance measure and a utility function?

3. for each of the following agents, consider their performance with respect to the following task environments

   (a) An algorithmic trader, makes recommendations on what percentage of one's portfolio should be invested in each of n possible stocks, i.e. a vector $p_1, \ldots, p_n$ where p_i is the amount that should be invested in stock i.

   (b) A chess playing AI, which recommends which move a player should make next.

   (c) A poker playing AI, which recommends what action a player should make (fold, raise by x amount, check or "all in").

Task Environment	Algo. Trader	Chess Player	Poker Player
Fully Observable			
Deterministic			
Episodic			
Static			
Discrete			
Single Agent			

4. Consider the Winograd schema discussed in class. Unlike the Turing test, they have *clear criteria* for success (percent of successful guesses), and have their own limitations (they require knowledge of English, they only test one type of intelligence etc.). Can you come up with your own intelligence test? It should satisfy the *clear success criterion* condition; what limitations does your test have?