Washington State University
School of Electrical Engineering and Computer Science
Fall 2020

CptS 440/540 Artificial Intelligence
Homework 1
Due: September 3, 2020 (11:59pm pacific time)

General Instructions: Put your answers to the following problems into a PDF document and submit as an attachment under Content → Homework 1 for the course CptS 440 Pullman (all sections of CptS 440 and 540 are merged under the CptS 440 Pullman section) on the Blackboard Learn system by the above deadline. Note that you may submit multiple times, but we will only grade the most recent entry submitted before the deadline.

1. Go to https://www.pandorabots.com/kuki/ and engage the chatbot in a conversation. Enter at least 10 comments/questions and copy the entire conversation into your homework. Based on this conversation explain why you think Kuki does or does not pass the Turing Test.

2. Suppose you want to design an intelligent agent to vacuum your home, similar to the iRobot Roomba (https://www.irobot.com/roomba).
    a. Describe two different sensors, two different actuators, and two different performance measures relevant to this task?
    b. For each of the following task environment properties, choose which option is most appropriate for this task. Include a brief explanation for each.
        i. Fully observable or partially observable?
        ii. Single agent or multi-agent?
        iii. Deterministic or stochastic?
        iv. Episodic or sequential?
        v. Static or dynamic?
        vi. Discrete or continuous?
    c. Which agent type is most appropriate for this task: simple reflex, model-based reflex, goal-based, or utility-based? Include a brief justification for your choice.

3. *CPTS 540 Students Only*: In their 2020 paper "Towards a Human-like Open-Domain Chatbot," available at https://arxiv.org/pdf/2001.09977.pdf, Google Research describes their Meena chatbot. Instead of a Turing test, they evaluate the chatbot using the SSA metric. What are the two elements of the SSA metric? In your own words, give a one-sentence description of each.