

AI - Assignment 1

Patrick Nagel: patrick.nagel@h-brs.de

Amirhossein Pakdaman: amirhossein.pakdaman@smail.inf.h-brs.de

Due Date: 13.10.2019

Task 1

Read chapter 2 of the book "Artificial Intelligence: A Modern Approach" by *Russel & Norvig* and create a mind map about its content.

Task 2

Briefly explain the concepts of *reflex*-, *model*-, *goal*- and *utility-based agents*.

Task 3

What is a Braitenberg vehicle? How would you classify Braitenberg vehicles? Are they reflex, model-, goal- or utility-based agents?

Task 4

The missionaries and cannibals problem states: Three missionaries and three cannibals are on the left side of a river, along with a boat that can hold one or two persons. The boat cannot move empty, since someone has to row. Find a way to get everyone to the other side, without ever leaving a group of missionaries on one side outnumbered by the cannibals on that side.

- (a) Think of one iteration as the sequence of loading the boat, rowing over the river and unloading the passengers. What information is required to fully describe the state of the problem before/after each iteration?
- (b) Find a solution to the problem manually.
- (c) Illustrate the complete state-space of the problem as a tree (a mind map tool will come in handy here as well!). The root node represents the initial configuration: all six individuals and the boat are on the left side of the river. Each edge represents a shipment of at most two persons to the other side. Add nodes for disallowed configurations, mark them accordingly and do not expand them further. Is it wise to check for repeated states? Why (not)?