Tutorial Artificial Intelligence WS 13/14 Wirtschaftsinformatik und Maschinelles Lernen (ISMLL) Ruth Janning, M.Sc., Carlotta Schatten M.Eng.

Exercise Sheet 11

Submission: Monday, 27.01.2013, 23:00

Exercise 3 Exam Refresh (20 Points)

a) Given a Flipper game, you want to design an artificial player. Describe its PEAS model and the environment type given the board in the image. The only place where the score can be increased is when the ball passes the entrance of the ramp.

(8 Points)

b) You want to travel from Hannover to Goslar. The arcs indicate the travel time, whereas the nodes the nodes indicates the cities: Hi: Hildesheim, Go: Goslar, Ha: Hannover, Ni: Nienhagen, Br: Braunschweig, Al: Alfeld, Gö: Göttingen, Sa: Salzgitter, Hm: Hameln.

You have also additional information: the air distances of the cities from Goslar:



In which order are the nodes visited from (a) Uniform Cost Search (b) Greedy Best-First Search? Mention all the steps. Which strategy is better and why? (4 Points)

c) Imagine the following scenario: a family of four needs to figure out how each family member will commute to work or school given several constraints. The family consists of a mother, father, son and daughter. Each family member can bicycle or ride in the car. Additionally the son has a pogo stick he can use for commuting to school. The assignment of transportation modes to family members is subject to the following constraints:

- (a) There are only two bicycles.
- (b) The car can only hold three people.
- (c) The son and daughter must take the same mode of transportation.
- (d) The son and daughter can only go by car if at least one of the parents is going by car, i.e. the parent(s) driving them to school.

What are the CSP variables in this problem? What values are in the domain of each variable? Use the Forward checking and Back Tracking to find a possible solution to the problem of this family. (8 Points)



Figure 1: Flipper game of Exercise 1