COS30019 - Introduction to Artificial Intelligence

Tutorial Problems Week 6

Task 1: (Exercise 7.2 from the textbook) Suppose in the Wumpus world the agent has progressed to the point shown in the following figure, having perceived nothing in [1,1], a breeze in [2,1], and a stench in [1,2], and is now concerned with the contents of [1,3], [2,2], and [3,1]. Each of these can contain a pit and at most one can contain a wumpus. Following the example in the lecture, construct the set of possible worlds. (You should find 32 of them.) Mark the worlds in which the KB is true and those in which each of the following sentences is true:
a_2 = "There is no pit in [2,2]."
a_3 = "There is a wumpus in [1,3]."
Hence show that KB |= a_2 and KB |= a_3.

1,4	2,4	3,4	4,4
1,3 **W!**	2,3	3,3	4,3
1,2 **A** **S** **OK**	2,2 **OK**	3,2	4,2
1,1 **V** **OK**	2,1 **B** **V** **OK**	3,1 **P!**	4,1

A = *Agent*
B = *Breeze*
G = *Glitter, Gold*
OK = *Safe square*
P = *Pit*
S = *Stench*
V = *Visited*
W = *Wumpus*

Task 2: Represent the following knowledge bases in propositional logic. How many possible worlds can you construct? How many models are there for the given knowledge base? What conclusions can you draw from these models?

[KB1] *If I am rich, then I am happy. I am happy.*

[KB2] *If I study hard, then I pass COS30019. If I am clever and I am lucky, then I pass COS30019. I do not pass COS30019*