# AI2 Module 4
# Tutorial 1

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These tutorial exercises are revision of logic material in modules 1 and 2. You will need your knowledge of propositional and predicate logic for module 4.
Try to solve these problems *before* your tutorial and come prepared to explain your solution to the rest of your tutorial group.

1. Read about the Wumpus World in Russell and Norvig 2nd edition §7.2 (§6.2 in 1st edition). The rest of the questions are all based on this domain.

2. Represent the following statement as a propositional logic formula: "There is a stench in square (1,1) if and only if there is a Wumpus in square (1,2) or square (2,1)". State the meanings of any propositional variables you use.

3. Complete a truth table for the following propositional formula.

$$OK \Leftrightarrow (\neg W \wedge \neg P)$$

   For what values of the propositional variables is the formula true?

4. Represent the following statement as a predicate logic formula: "If the agent is at a square in which there is a glitter and executes a pick up action then at the next moment it will be holding some gold". State the meanings of any predicates and functions you use.

5. Put the following formula in clausal form:

$$\forall p.\ (B(p) \Leftrightarrow \exists q.\ Adj(p,q) \wedge P(q))$$

6. Given the following knowledge base of clauses:

$$\begin{aligned} S(<1,2>) &\Rightarrow && (1)\\ &\Rightarrow && Adj(<1,2>,<2,2>) \quad (2)\\ &\Rightarrow && Adj(<1,2>,<1,3>) \quad (3)\\ Adj(p,q) \wedge W(q) &\Rightarrow && S(p) \quad (4) \end{aligned}$$

   Derive (5), $\Rightarrow W(<2,2>)$, by resolution.