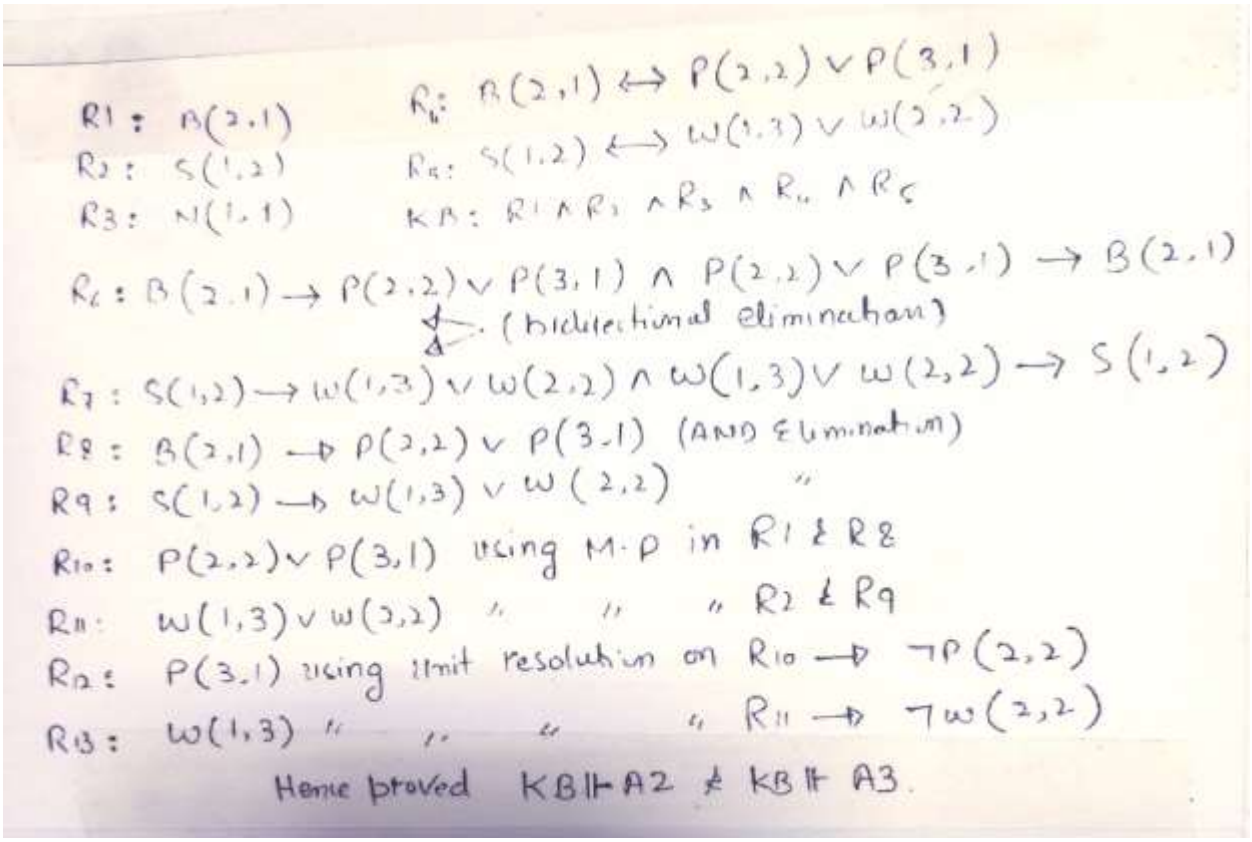


The question is about logical entailment in a Wumpus world, a common artificial intelligence problem. The solution involves logical reasoning based on the rules given.

Here's the step-by-step explanation of the solution:

1. **R1** states that there is a breeze in (2,1).
2. **R2** states that there is a stench in (1,2).
3. **R3** states that there is nothing in (1,1).

Rules **R4** to **R9** are derived rules:

4. **R4** and **R6**: If there is a breeze in (2,1), then there must be a pit in either (2,2) or (3,1).
5. **R5** and **R7**: If there is a stench in (1,2), then there must be a Wumpus in either (1,3) or (2,2).
6. **R8**: is derived from **R4** and **R6** through the logical equivalence that if B(2,1) then P(2,2) or P(3,1). This logical equivalence allows for the removal of B(2,1) by replacing it with the conditions that entail it.
7. **R9**: is derived from **R5** and **R7** through the logical equivalence that if S(1,2) then W(1,3) or W(2,2). Similarly, this allows for the removal of S(1,2) by replacing it with the conditions that entail it.

8. **R10**: is the resolution of **R8**, stating that there is a pit in (2,2) or (3,1).
9. **R11**: is the resolution of **R9**, stating that there is a Wumpus in (1,3) or (2,2).
10. **R12**: Applying resolution to **R10**, the negation of P(3,1) (not P(3,1)) can be derived, which entails that there is not a pit in (3,1).
11. **R13**: Similarly, applying resolution to **R11**, the negation of W(2,2) (not W(2,2)) can be derived, which entails that there is not a Wumpus in (2,2).
12. The conclusion is drawn that the Knowledge Base (KB) entails A2 and A3, which are:
    - A2: "There is no Wumpus in (1,3)" which can be concluded from **R13** since if there is no Wumpus in (2,2) and a Wumpus must be in either (1,3) or (2,2), it must be in (1,3).
    - The final resolution shows that based on the rules and the logical deductions made, there is no pit in (2,2) and no Wumpus in (2,2), supporting A1 and A2 respectively.

To clarify, the solution seems to have a slight inconsistency in the end: It mentions "KB entails A3," but A3 is not defined in the given material. It probably refers to the conclusion that there is no Wumpus in (2,2), which aligns with A2's statement. The proof thus shows that, given the KB, it can be logically concluded that there is no pit in (2,2) and no Wumpus in (1,3).