Monkey & Banana Problem

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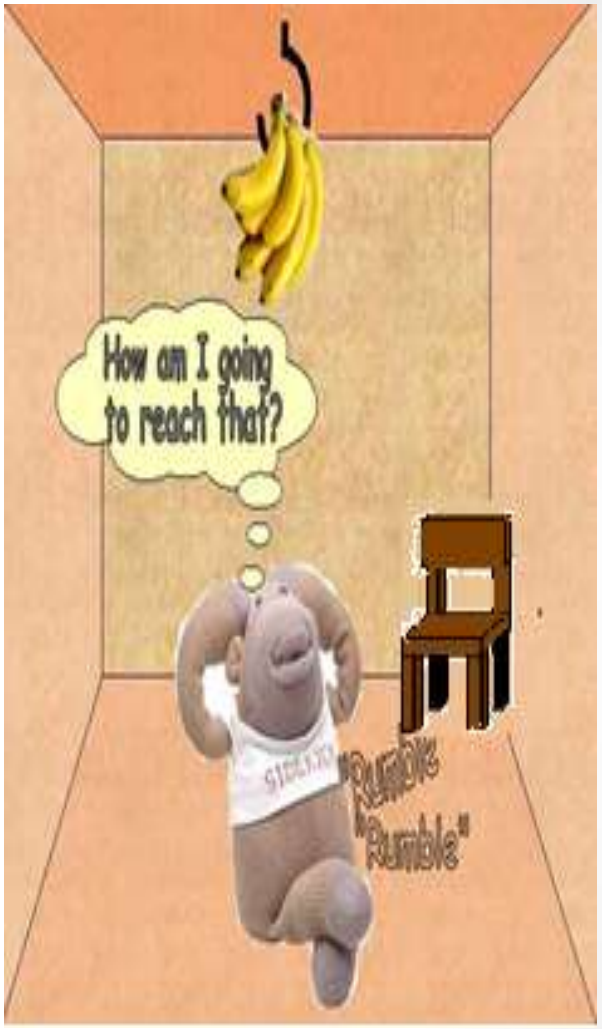
- A hungry monkey is in a room.
- Bananas have been hung from the center of the ceiling of the room.
- In the corner of the room there is a chair.
- The monkey wants the bananas but he can’t reach them.
- What shall he do?



If the monkey is cleaver enough, he can reach the bananas by placing the chair directly below the bananas and climbing on the top of the chair.

Relevant factors for the problem

- **Constants**

  {floor, chair, bananas, monkey}

- **Variables**

  {x,y,z}

- **Predicates**

1. IN_ROOM(x)
2. CAN_REACH(x,y)

3. CAN_CLIMB(x,y)
4. CAN_MOVE(x,y,z)
5. DEXTEROUS(x)
6. TALL(x)
7. UNDER(x,y)
8. GET_ON(x,y)
9. CLOSE(x,y)

Axioms/Assertions/Given Statements

1. IN_ROOM(monkey)
2. IN_ROOM(chair)
3. IN_ROOM(banana)
4. DEXTEROUS(monkey)
5. TALL(chair)
6. CAN_CLIMB(monkey,chair)

7. CAN_MOVE(monkey,chair,banana)
8. ~CLOSE(banana,floor)
9. DEXTEROUS(x) & CLOSE(x,y) -> CAN_REACH(x,y)
10. GET_ON(x,y) & UNDER(y,banana) & TALL(Y) ->

    CLOSE(x,banana)
11. IN_ROOM(x) & IN_ROOM(y) & IN_ROOM(z) &

    CAN_MOVE(x,y,z) -> CLOSE(z,floor) V UNDER(Y,Z)
12. CAN_CLIMB(x,y) -> GET_ON(x,y)

Clausal Form

1. IN_ROOM(monkey)
2. IN_ROOM(chair)
3. IN_ROOM(banana)
4. DEXTEROUS(monkey)
5. TALL(chair)
6. CAN_CLIMB(monkey,chair)
7. CAN_MOVE(monkey,chair,banana)

8. ~CLOSE(banana,floor)
9. ~DEXTEROUS(x) V ~CLOSE(x,y) V CAN_REACH(x,y)
10. ~ GET_ON(x,y) V ~UNDER(y,banana) V ~TALL(Y) V CLOSE(x,banana)
11. ~IN_ROOM(x) V ~IN_ROOM(y) V ~IN_ROOM(z) V ~CAN_MOVE(x,y,z) V CLOSE(z,floor) V UNDER(Y,Z)
12. ~CAN_CLIMB(x,y) V GET_ON(x,y)
13. ~CAN_REACH(monkey,banana)

Resolvents

14. ~CAN_MOVE(monkey,chair,banana) V

    CLOSE(banana,floor) V UNDER(chair,banana)

    Resolvent of 1,2,3,& 11.

    β={monkey/x,chair/y,banana/z}

15. CLOSE(banana,floor) V UNDER(chair,banana)

    Resolvent of 7 & 14.

16. UNDER(chair,banana)

    Resolvent of 8 &15.

17. ~GET_ON(x,chair) V ~TALL(chair) V CLOSE(x,banana)

    Resolvent of 10 & 16.

    β={chair/y}

18. ~GET_ON(x,chair) V CLOSE(x,banana)

    Resolvent of 5 & 17.

19. GET_ON(monkey,chair)

    Resolvent of 6 & 12.

20. CLOSE(monkey,banana)

    Resolvent of 18 & 19.

    β={monkey/x}

21. ~CLOSE(monkey,y) V CAN_REACH(monkey,y)

    Resolvent of 4 & 9.

    β={monkey,x}

22. CAN_REACH(monkey,banana)

    Resolvent of 20 & 21.

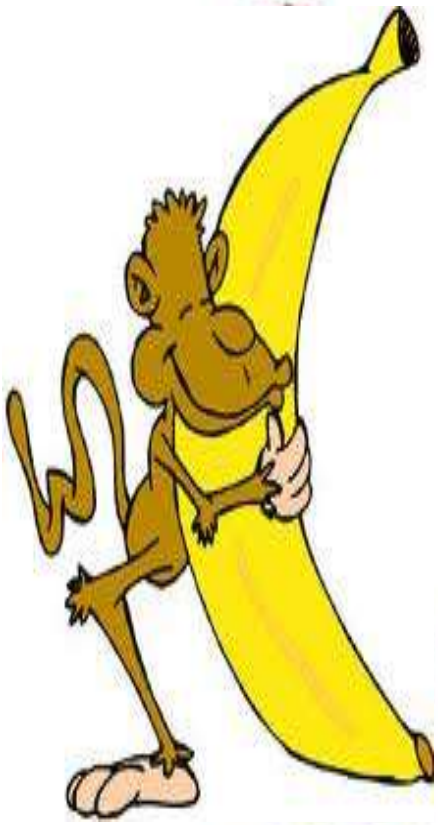
    β={banana/y}

23. []

    Resolvent of 13 & 22.

Resolution Proof

- **CAN_REACH(monkey, banana)**



Thank You