

# LAB ASSIGNMENT 3

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## Question 1

```
initial_state(monkey(at_door), on_floor, at_window, has_not_grasped).

goal_state(_, _, _, has_grasped).

perform_action(walk, monkey(at_door), BananaState, monkey(in_room), BananaState).
perform_action(climb, monkey(Location), BananaState, monkey(on_box), BananaState) :-
    Location \= on_box.
perform_action(push, monkey(Location), BananaState, monkey(NewLocation), BananaState) :-
    Location \= at_window,
    NewLocation \= on_box.
perform_action(grasp, monkey(on_box), BananaState, monkey(on_box), BananaState) :-
    BananaState = BananaLocation,
    BananaLocation \= ceiling.

solve(State, Path) :-
    solve(State, [], Path).

solve(State, Path, Path) :-
    goal_state(State, _, _, _).

solve(State, Visited, Path) :-
    \+ member(State, Visited),
    perform_action(_, State, _, NewState, _),
    solve(NewState, [State|Visited], Path).

can_get_banana :-
    initial_state(InitialMonkeyState, _, _, _),
    solve(InitialMonkeyState, Path),
    write('Actions to get the banana: '), write(Path), nl.
```

```
SWI-Prolog (AMD64, Multi-threaded, version 9.0.4)
File Edit Settings Run Debug Help
% C:/Users/Asus/Documents/Prolog/lab assignment 3.pl compiled 0.00 sec, 0 clauses
?- trace.
true.
[trace] ?- can_get_banana.
Call: (10) can_get_banana ? creep
Call: (11) initial_state(_4368, _4444, _4446, _4448) ? creep
Exit: (11) initial_state(monkey(at_door), on_floor, at_window, has_not_grasped) ? creep
Call: (11) solve(monkey(at_door), _6010) ? creep
Call: (12) goal_state(monkey(at_door), _7710, _7712, _7714) ? creep
Exit: (12) goal_state(monkey(at_door), _8528, _8530, has_grasped) ? creep
Exit: (11) solve(monkey(at_door), [], []) ? creep
Call: (11) write('Actions to get the banana: ') ? creep
Actions to get the banana:
Exit: (11) write('Actions to get the banana: ') ? creep
Call: (11) write([]) ? creep
[]
Exit: (11) write([]) ? creep
Call: (11) nl ? creep
Exit: (11) nl ? creep
Exit: (10) can_get_banana ? creep
true.
[trace] ?-
■
```

## Question 2

```
rectangle(width(Width), height(Height), position(X, Y)).
```