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Write a program to solve the Monkey Banana problem by learning concepts.

Suppose the problem is as given below –

- A hungry monkey is in a room, and he is near the door.
- The monkey is on the floor.
- Bananas have been hung from the center of the ceiling of the room.
- There is a block (or chair) present in the room near the window.
- The monkey wants the banana, but cannot reach it.

So if the monkey is clever enough, he can come to the block, drag the block to the center, climb on it, and get the banana. Below are few observations in this case –

- Monkey can reach the block, if both of them are at the same level. From the above image, we can see that both the monkey and the block are on the floor.
- If the block position is not at the center, then monkey can drag it to the center.
- If monkey and the block both are on the floor, and block is at the center, then the monkey can climb up on the block. So the vertical position of the monkey will be changed.
- When the monkey is on the block, and block is at the center, then the monkey can get the bananas.

Code

```
DO( STATE(MIDDLE, ONBOX, MIDDLE, HASNOT),
    GRAB,
    STATE(MIDDLE, ONBOX, MIDDLE, HAS) ).
```

```
DO( STATE(L, ONFLOOR, L, BANANA),
    CLIMB,
    STATE(L, ONBOX, L, BANANA) ).
```

```
DO( STATE(L1, ONFLOOR, L1, BANANA),
    PUSH(L1, L2),
    STATE(L2, ONFLOOR, L2, BANANA) ).
```

```
DO( STATE(L1, ONFLOOR, BOX, BANANA),
    WALK(L1, L2),
    STATE(L2, ONFLOOR, BOX, BANANA) ).
```

```
CANGET(STATE(_, _, _, HAS)).
```

CANGET(STATE1) :-

DO(STATE1, ACTION, STATE2),
CANGET(STATE2).

CANGET(STATE(, , , HAS), []).

CANGET(STATE1, PLAN) :-
DO(STATE1, ACTION, STATE2),
CANGET(STATE2, PARTIALPLAN),
ADD(ACTION, PARTIALPLAN, PLAN).

ADD(X,L,[X|L]).

Output

```

% C:\Users\user\Documents\prolog\trace.pl compiled 0.00 sec. -2 clauses
[trace] ?- canget(state(atdoor, onfloor, atwindow, hasnot), Plan)
Call: (10) canget(state(atdoor, onfloor, atwindow, hasnot), _23794) ? creep
Call: (11) do(state(atdoor, onfloor, atwindow, hasnot), _26074, _26076) ? creep
Exit: (11) do(state(atdoor, onfloor, atwindow, hasnot), walk(atdoor, _25790), state(_25790, onfloor, atwindow, hasnot)) ? creep
Call: (11) canget(state(_25790, onfloor, atwindow, hasnot), _26500) ? creep
Call: (12) do(state(_25790, onfloor, atwindow, hasnot), _27316, _27318) ? creep
Exit: (12) do(state(atwindow, onfloor, atwindow, hasnot), climb(state(atwindow, onbox, atwindow, hasnot)) ? creep
Call: (12) canget(state(atwindow, onbox, atwindow, hasnot), _28846) ? creep
Call: (13) do(state(atwindow, onbox, atwindow, hasnot), _29602, _29604) ? creep
Exit: (13) do(state(atwindow, onbox, atwindow, hasnot), _29602, _29604) ? creep
Fail: (12) canget(state(atwindow, onbox, atwindow, hasnot), _28846) ? creep
Redo: (12) do(state(_25790, onfloor, atwindow, hasnot), _27316, _27318) ? creep
Call: (12) canget(state(atwindow, onfloor, atwindow, hasnot), push(atwindow, _32638), state(_32638, onfloor, _32638, hasnot)) ? creep
Call: (12) canget(state(_32638, onfloor, _32638, hasnot), _33488) ? creep
Call: (13) do(state(_32638, onfloor, _32638, hasnot), _34154, _34156) ? creep
Exit: (13) do(state(_32638, onfloor, _32638, hasnot), climb(state(_32638, onbox, _32638, hasnot)) ? creep
Call: (13) canget(state(_32638, onbox, _32638, hasnot), _35694) ? creep
Call: (14) do(state(_32638, onbox, _32638, hasnot), _36450, _36452) ? creep
Exit: (14) do(state(middle, onbox, middle, hasnot), grab(state(middle, onbox, middle, has)) ? creep
Call: (14) canget(state(middle, onbox, middle, has), _37980) ? creep
Exit: (14) canget(state(middle, onbox, middle, has), []) ? creep
Call: (14) add(grab, [], _35494) ? creep
Exit: (14) add(grab, [], [grab]) ? creep
Exit: (13) canget(state(middle, onbox, middle, hasnot), [grab]) ? creep
Call: (13) add(climb, [grab], _33488) ? creep
Exit: (13) add(climb, [grab], [climb, grab]) ? creep
Exit: (12) canget(state(middle, onfloor, middle, hasnot), [climb, grab]) ? creep
Call: (12) add(push(atwindow, middle), [climb, grab], _26560) ? creep
Exit: (12) add(push(atwindow, middle), [climb, grab], [push(atwindow, middle), climb, grab]) ? creep
Exit: (11) canget(state(atwindow, onfloor, atwindow, hasnot), [push(atwindow, middle), climb, grab]) ? creep
Call: (11) add(walk(atdoor, atwindow), [push(atwindow, middle), climb, grab], _27794) ? creep
Exit: (11) add(walk(atdoor, atwindow), [push(atwindow, middle), climb, grab], [walk(atdoor, atwindow), push(atwindow, middle), climb, grab]) ? creep
Exit: (10) canget(state(atdoor, onfloor, atwindow, hasnot), [walk(atdoor, atwindow), push(atwindow, middle), climb, grab]) ? creep
Plan = [walk(atdoor, atwindow), push(atwindow, middle), climb, grab] .

[trace] ?- canget(state(Monkey, onfloor, atwindow, hasnot), Plan)
Call: (10) canget(state(_50688, onfloor, atwindow, hasnot), _50700) ? creep
Call: (11) do(state(_50688, onfloor, atwindow, hasnot), _61960, _61962) ? creep
Exit: (11) do(state(atwindow, onfloor, atwindow, hasnot), climb(state(atwindow, onbox, atwindow, hasnot)) ? creep
Call: (11) canget(state(atwindow, onbox, atwindow, hasnot), _53490) ? creep
Call: (12) do(state(atwindow, onbox, atwindow, hasnot), _54246, _54248) ? creep
Exit: (12) do(state(atwindow, onbox, atwindow, hasnot), _54246, _54248) ? creep
Fail: (11) canget(state(atwindow, onbox, atwindow, hasnot), _53490) ? creep
Redo: (11) do(state(_50688, onfloor, atwindow, hasnot), _61960, _61962) ? creep
Exit: (11) do(state(atwindow, onfloor, atwindow, hasnot), push(atwindow, _57282), state(_57282, onfloor, _57282, hasnot)) ? creep
Call: (11) canget(state(_57282, onfloor, _57282, hasnot), _58052) ? creep
Call: (12) do(state(_57282, onfloor, _57282, hasnot), _58080, _58082) ? creep
Exit: (12) do(state(_57282, onfloor, _57282, hasnot), climb(state(_57282, onbox, _57282, hasnot)) ? creep
Call: (12) canget(state(_57282, onbox, _57282, hasnot), _60338) ? creep
Call: (13) do(state(_57282, onbox, _57282, hasnot), _61094, _61096) ? creep
Exit: (13) do(state(middle, onbox, middle, hasnot), grab(state(middle, onbox, middle, has)) ? creep
Call: (13) canget(state(middle, onbox, middle, has), _62624) ? creep
Exit: (13) canget(state(middle, onbox, middle, has), []) ? creep
Call: (13) add(grab, [], _60338) ? creep
Exit: (13) add(grab, [], [grab]) ? creep
Exit: (12) canget(state(middle, onbox, middle, hasnot), [grab]) ? creep
Call: (12) add(climb, [grab], _58052) ? creep
Exit: (12) add(climb, [grab], [climb, grab]) ? creep
Exit: (11) canget(state(middle, onfloor, middle, hasnot), [climb, grab]) ? creep
Call: (11) add(push(atwindow, middle), [climb, grab], _50700) ? creep
Exit: (11) add(push(atwindow, middle), [climb, grab], [push(atwindow, middle), climb, grab]) ? creep
Exit: (10) canget(state(atwindow, onfloor, atwindow, hasnot), [push(atwindow, middle), climb, grab]) ? creep
Monkey = atwindow.
Plan = [push(atwindow, middle), climb, grab] .

```