Monkey Banana Problem

Definition:

"A monkey is in a room. A bunch of bananas is hanging from the ceiling. The monkey cannot reach the bananas directly. There is a chair in the corner of the room. How can the monkey get the bananas?"

Procedure:

The solution of the problem is of course that the monkey must push the chair under the bananas, then stand on the chair and grab the bananas. The purpose of the problem is to raise the question: Are monkeys intelligent? Both humans and monkeys have the ability to use mental maps to remember things like where to go to find shelter or how to avoid danger. They can also remember where to go to gather food and water, as well as how to communicate with each other. Monkeys have the ability not only to remember how to hunt and gather but they also have the ability to learn new things, as is the case with the monkey and the bananas. Even though that monkey may never have entered that room before or had only a chair for a tool to gather the food available, that monkey can learn that it needs to move the chair across the floor, position it below the bananas and climb the chair to reach for them. Some people believe that this is part instinct, part learned behaviour. It is most probably both.

Our "Monkey World"

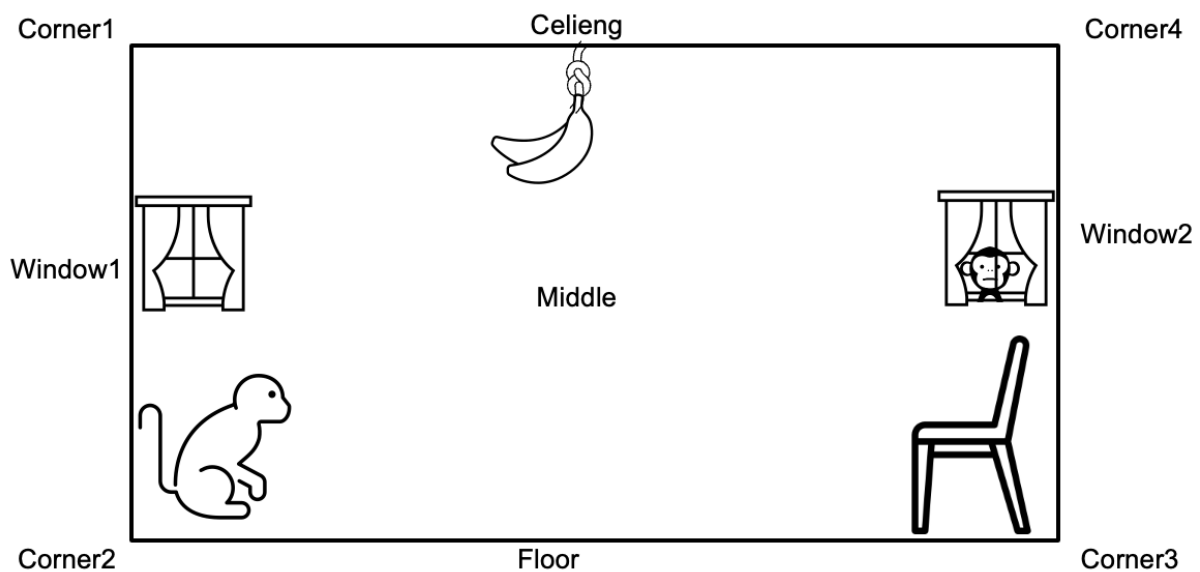The situation we have is reported in Figure 1.

Figure 1. Our "Monkey World"

The action available to the monkey include:

"Go" from one place to another.

"Push" an object from one place to another.

"Climb" onto an object.

"Grasp" an object.

"Separate" one object from the rest of the objects. (not everything can be separated)

"Eat" an object. (not everything is eatable)

"Open" an object. (not everything can be opened)

"Give" an object. (not everything can be given)

Grasping results in holding the object if the monkey and the object are in the same place.

Eat can only happen if monkey has managed to grasp something.

Separate can only happen if monkey has managed to grasp something.

Define a Prolog program that can answer to questions such as:

- Which are the actions that the monkey must perform to eat bananas? **Mandatory**
- Is there a sequence of actions that allows both monkeys to eat? **Optional**

Mandatory means the question must be answered by your program
Optional means that you can exercise extending the program so to answer also that question