

## Example for how to Translate a Planning Problem to STRIPS notation

Assume that there is a monkey in a room with some bananas hanging out of reach from the ceiling, but a box is available that will enable the monkey to reach the bananas if he climbs on it. Initially, the monkey is at A, the bananas at B, and the box at C. The monkey and box have height LOW, but if the monkey climbs onto the box, he will have height HIGH, the same as the bananas. The actions available to the monkey include GO from one place to another, PUSH an object from one place to another, CLIMB onto an object, and GRASP an object. Grasping results in holding the object if the monkey and object are in the same place at the same height. The monkey wants to get the bananas.

Initial State:

At(Monkey,A)  
At(Bananas,B)  
At(Box,C)  
Height(Monkey,Low)  
Height(Box,Low)  
Height(Bananas,High)  
Pushable(Box)  
Climbable(Box)  
Graspable(Bananas)

Goal State:

Have(Monkey, Bananas)

Operators:

Go(x,y)

Precond: At(Monkey,x) AND Height(Monkey,Low)  
Effect: At(Monkey,y) AND NOT At(Monkey,x)

Push(b,x,y)

Precond: At(Monkey,x) AND Height(Monkey,Low) AND At(b,x) AND Pushable(b) AND Height(b,Low)  
Effect: At(b,y) AND At(Monkey,y) AND NOT At(b,x) AND NOT At(Monkey,x)

ClimbUp(b)

Precond: At(Monkey,x) AND Height(Monkey,Low) AND At(b,x) AND Climbable(x) AND Height(b,Low)  
Effect: On(Monkey,b) AND NOT Height(Monkey,Low) AND Height(Monkey,High)

Grasp(b)

Precond: At(Monkey,x) AND Height(Monkey,h) AND At(b,x) AND Graspable(b) AND Height(b,h)  
Effect: Have(Monkey,b)

It is a good exercise to add a ClimbDown operator (although it is not necessary to solve the planning problem). Notice that if the monkey holds something and climbs up or down, not only does the height of the monkey change but also the height of the object that it is holding.