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HW4: Game Playing

1. Define preconditions, add, and delete lists for *pick_up(x, y)* and *place(x, y)*
   Pick_up(x, y):

Preconditions	Add	Delete
On(x, y) Clear(x) $\forall z, \neg$Holding(z)	Holding(x)	On(x, y) Clear(x)

   Place(x, y):

Preconditions	Add	Delete
Holding(x) Clear(y) $\neg$IsTriangle(y)	On(x, y) Clear(x)	Holding(x)

2. How would you express a goal that there are two towers, each of height 3 blocks, with pyramids on top of each tower?

   Goal: $\exists$(a, b, c, d, e, f), (On(a, Table)$\wedge$On(b, a)$\wedge$On(c, b)$\wedge$IsTriangle(c))$\wedge$(On(d, Table)$\wedge$On(e, d)$\wedge$On(f, e)$\wedge$IsTriangle(d))$\wedge$(a $\neq$ d)

3. What planning accommodations must be made for the plank object?

   The plank would need its own place method, *place(x, y, z)*, which takes two non-triangle blocks to support the plank. If both blocks are of equal height or are both Table then the plank can be placed. Placing the plank on blocks would result in $\neg$Clear(y) and $\neg$Clear(z). If blocks cannot be placed on the plank then *place(x, y)* would need to check that y is both not a plank and not a triangle. If blocks can be placed on the plank, then On(Plank, z) could be true for some number of z's greater than 1.