

# HW4: Classical Planning and Constraint Satisfaction

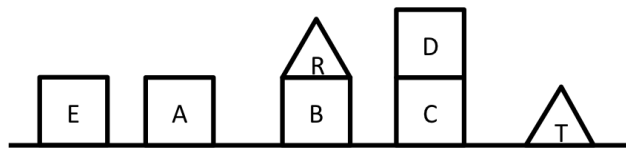
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## 1 Classical Planning

Suppose we have a blocks world problem as shown in the following figure. The world is made up of cube blocks and pyramid blocks. There is also a table which all of the objects can rest on. Your agent has two actions available to it: *pick-up*( $x,y$ ) and *place*( $x,y$ ), where  $y$  is the location that object  $x$  is currently on or will be placed on.



1. Define the preconditions and postconditions (add and delete lists) for the two actions. Assume the agent can only pick up a single object with nothing on it, that it can only hold a single object at a time, and that it can only place the object on a horizontally-flat, open surface.
2. How would you express a goal that there are two towers, each of height 3 blocks, with pyramids on top of each tower?
3. Suppose we introduce a new type of *plank* object into the environment, which is long and skinny and must be supported by either the table or two blocks. What necessary changes would you have to make to your planning description to accommodate these changes?