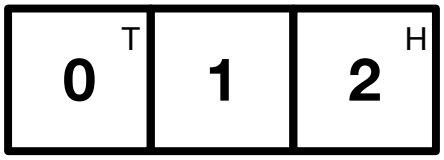
Algorithmic Thinking Puzzle 1: Swap

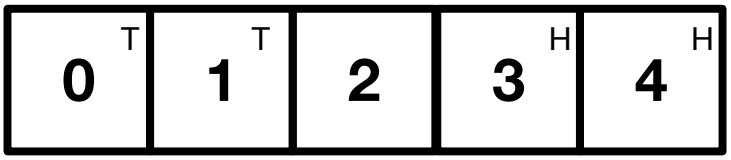
Place small coins heads up on the squares marked H and tails up on the squares marked T. Swap the positions of the Heads for the Tails in as few moves as possible.

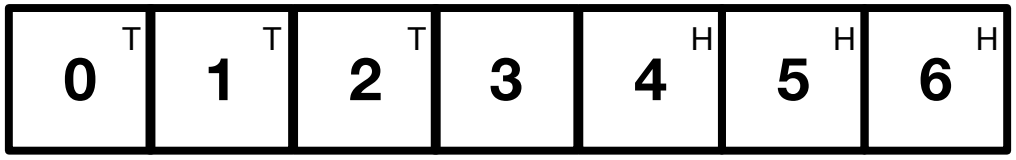
There are two ways to move a piece:
1. Move left or right to an adjacent empty square
2. Jump over a single adjacent piece into an empty space.

It is not good enough to just complete the puzzle. To solve it, you must write down the algorithm: the sequence of instructions so anyone who follows them can complete it. (eg a move might be written "1 <— 0" to mean move the piece on square 0 to square 1).

There are three increasingly larger boards that get harder. Complete the first in 3 moves, the second in 8 moves and the third in 15 moves. Your solution must be fast (ie take as few moves as possible). If your early solutions take more than the above number of moves then keep trying until you find more efficient algorithms.







A bit of computational thinking wisdom

Harder problems can be made easier by tackling simpler version first, then generalising the solution.