ACM40660 Practical 10

ICHEC

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1 Overview

This problem takes some thinking about to achieve. It can however be solved using a recursive function. If you consider the method at the end that will give you a clue about howe this might be achieved.

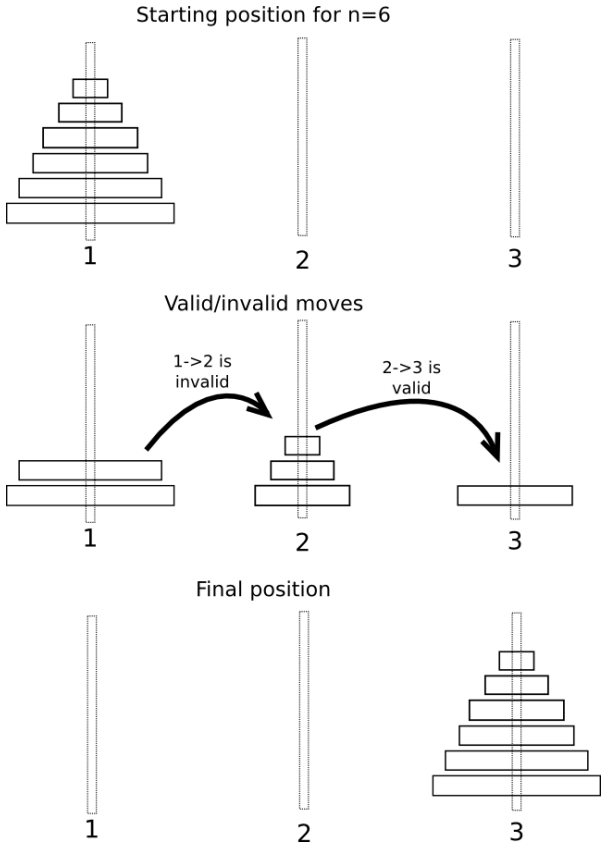
2 Exercises

- The Tower of Hanoi is a puzzle game. It consists of three rods, and a number of disks of different sizes which can slide onto any rod. The puzzle starts with the disks in a neat stack in ascending order of size on one rod, the smallest at the top, thus making a conical shape.

  The objective of the puzzle is to move the entire stack to another rod, obeying the following rules:

  1. Only one disk may be moved at a time.
  2. Each move consists of taking the upper disk from one of the rods and sliding it onto another rod, on top of the other disks that may already be present on that rod.
  3. No disk may be placed on top of a smaller disk.

  The following figure illustrates the puzzle:



- Write a function that prints on screen the sequence of moves required to solve the puzzle for any given number n. If you want to move n discs from rod 1 to rod 3, using rod 2 as an intermediary, the problem can be split into the following;

  1. If $n = 1$, then we simply need to move the disc from rod 1 to rod 3.
  2. If $n > 1$, then we want to move $n-1$ discs from rod 1 to rod 2 (using rod 3 as an intermediary), which leaves disc n alone on rod 1. Move that disc from rod 1 to rod 3. Finally, move the $n-1$ discs from rod 2 to rod 3, using rod 1 as an intermediary.