

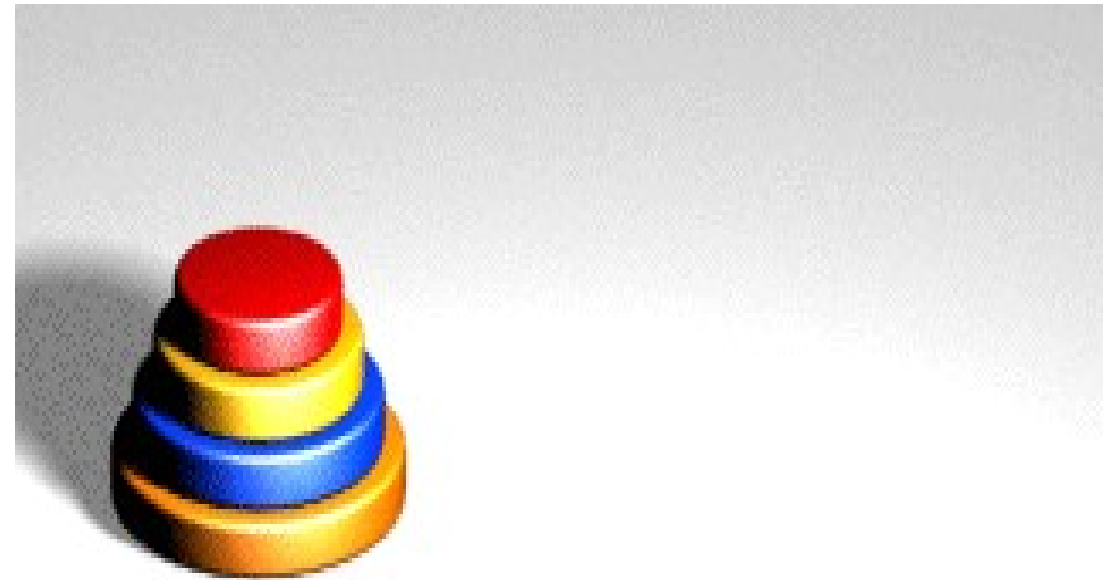
Tower of Hanoi

A Solution using Recursion

Tower of Hanoi - Rules

The objective of this game is to move the stack of disks from the initial rod to another rod following these rules:

- Only one disk can be moved among the towers at any given time
- Only the “top” disk can be removed
- No large disk can sit over a small disk



The Magic Tool

- Image you are given a magic tool that can move a stack of any height from any rod to any other rod:

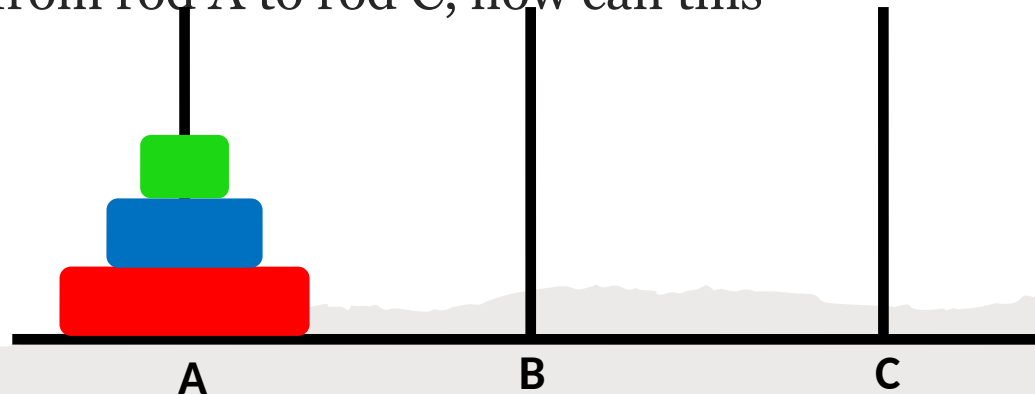
`hanoi(height, from, to)`

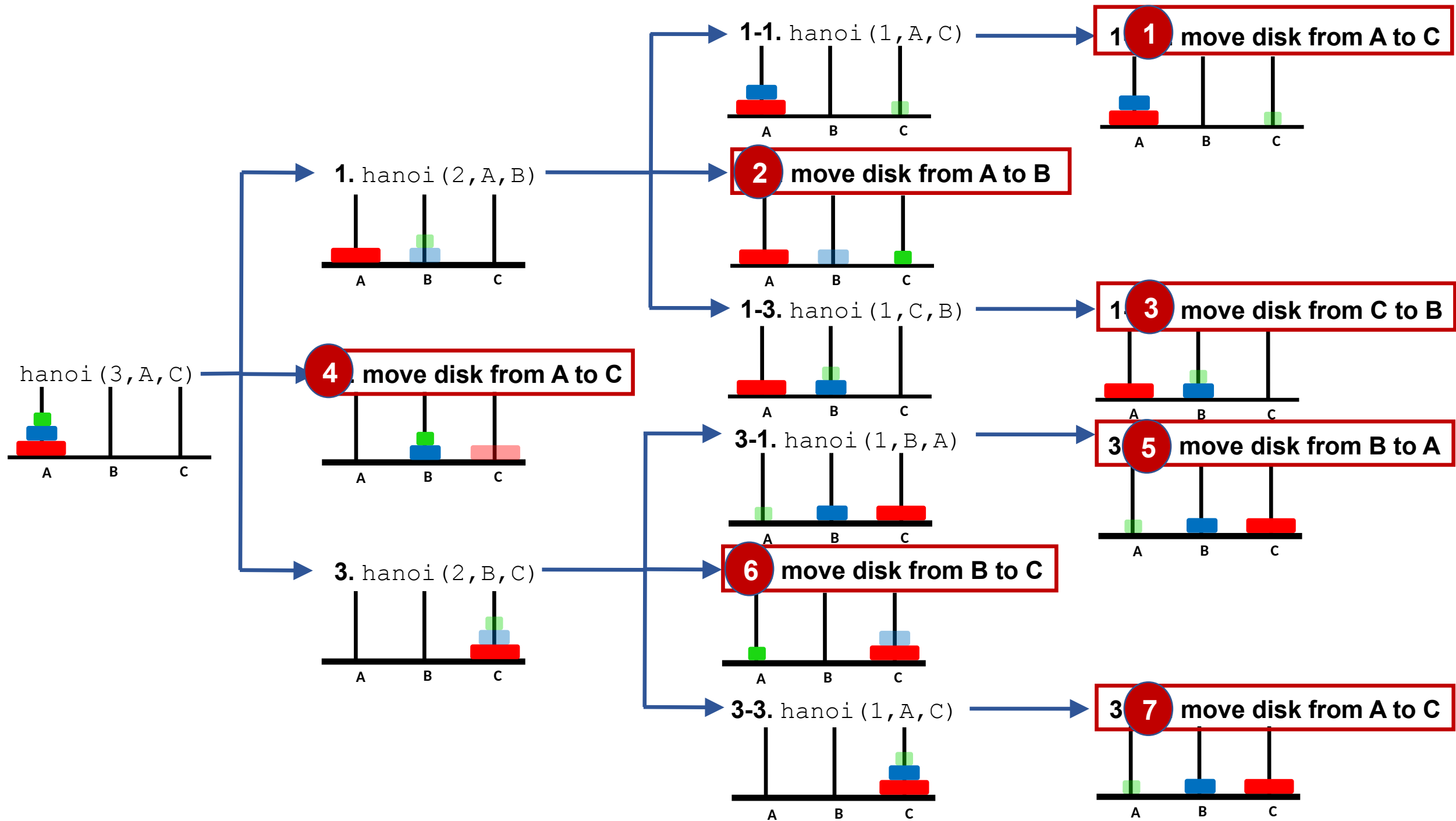
`height` – height of the stack

`from` – the rod where the stack is initially

`to` – the rod where the stack will be moved to


- This tool is magical, you don't need to know how it works
- If you need to move a stack of 3 disks from rod A to rod C, how can this magical tool help you?





How to Create the Magic Tool

```
hanoi(height, from, to)
```



```
if height is 1  
    move disk from rod "from" to rod  
    "to"
```

```
hanoi(height-1, from, spare rod)
```

```
move disk from rod "from" to rod "to"
```

```
hanoi(height-1, spare rod, to)
```

Properties of Recursive Algorithm

- It must call itself
- It must have a base case
- It must change its state and move towards the base case