Towers of hanoi can be solved both in a recursive way and an iterative way. Both methods differ and have their own advantages and disadvatnages.

Here we can see the recursive method. The function towerOfHanoi is defined with 5 paramaters going into it. Within the function we have a base case of n = 0 where function returns without doing anything. This happens when there is no disks left to move – the program can exit. After that the function calls itself recursively passing in the prior paramaters except this time decreasing n by one, which is the number of disks remaining. In this problem there is 3 disks therefore the function is called a 2nd time in order to complete the problem.

Main has hardcoded paramaters and calls the function for the first time.

This approach is easy to understand and implement. It is straightforward and solution is also easy to visualize and keep track of.

The second method is iteration. Here is the code. Straight away we can see that there is much more code and it looks more complicated.

The code defies an array rod with 3 rods in it. Then a vector is created with each stack representing a rod and the element in each stack representing the disk. The function movedisk takes in 2 integers representing the starting and end rods. The function validates if the rods are empty or the previously placed disk is bigger than the currently placed one. If validated then the disk is moved from the starting rod to the end rod. If these conditions aren’t met function calls itself recusivley swapping the starting and ending rod.

The second function towerofHanoi takes in the number of disks in the puzzle. It pushes disks onto the staring rod from largest to smallest and calculated the number of total moves required to solve the puzzle. Then the for loop calls the movedisk function to move the disks.

Main just initializes the tower of Hanoi function

Overall both methos can be used to solve this problem however the recursion makes the solution simple and efficient whereas the intirative method makes the code complicated, hard to read and understand.