Metropolitan University of Tirana
Data Structures
Powering GamePlay with Data Structures

10.1 Towers of Hanoi

Towers of Hanoi is a mathematical puzzle that consists of three rods and a set of disks of different sizes that can slide onto any rod. The puzzle starts with all 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 simple rules:

1. Only one disk can be moved at a time.
2. Each move consists of taking the upper disk from one of the stacks and placing it on top of another stack or on an empty rod.
3. No disk may be placed on top of a smaller disk.

Develop a Java program that implements Towers of Hanoi. Which data structure would you use? Motivate your choice

10.2 Sudoku Solver

Sudoku is a popular puzzle game that involves filling a 9x9 grid with numbers so that each row, column, and $3x3$ sub-grid contains all the digits from 1 to 9. The game starts with some of the cells already filled in, and the goal is to fill in the remaining cells while following the rules of the game.

The rules of Sudoku are as follows:

1. Each row must contain all the digits from 1 to 9.
2. Each column must contain all the digits from 1 to 9.
3. Each 3x3 sub-grid must contain all the digits from 1 to 9.

Develop a Java program that implements Sudoku. Which data structure would you use? Motivate your choice