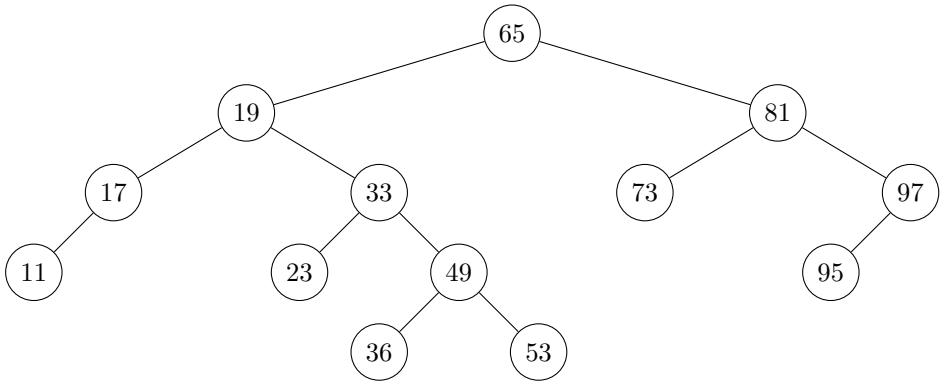
CS 240: Data Structures and Data Management **Fall 2025**

Tutorial 04: October 3

1. **Bounded Digit Sorting**
   Given an array A of n positive integers such that the total number of decimal digits in all integers combined is ℓ, design an algorithm to sort A in $O(\ell)$ time.

2. **AVL Operations**
   Consider the AVL Tree shown below and perform the following operations: insert 61, delete 73, delete 49.



3. **Modified AVL Height**
   Consider a modified version of an AVL tree called an AVL-2 Tree, where for every node z, we have $|\text{height}(z.\text{left}) - \text{height}(z.\text{right})| \leq 2$. Prove that the height of an AVL-2 tree is in $O(\log n)$.