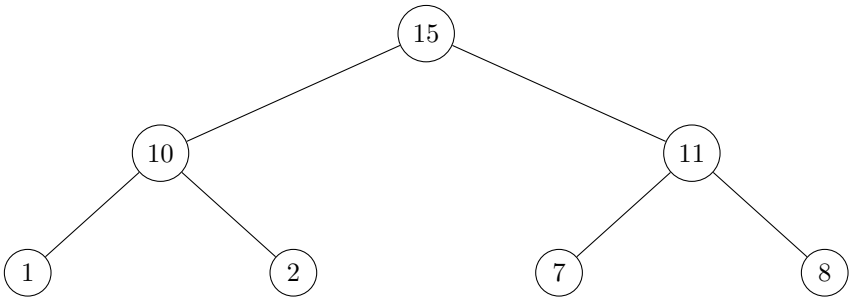
CS 240: Data Structures and Data Management **Fall 2025**

Tutorial 02: September 19

1. **Average Runtime Analysis**
   Suppose A is an array containing n distinct elements. In addition, assume each element is in between 1 and n, inclusive. Analyze this pseudo-code to determine a tight bound on the average number of question mark (?) that are printed, rather than a runtime. You may assume n is divisible by 2.

```
mystery(A, n)
    count = 1
    for i = 1 to n-1
        if A[i] is divisible by A[0]
         count++
    for i = 1 to count
        print("?")
```

2. **Max-Heap Operations**
   Insert 27 and 9 into the following heap, and then perform a delete-max operation on the resulting heap.



3. **Algorithm Design - Heaps**
   How would you implement a stack using a heap? Analyse the complexity of the push and pop operations.