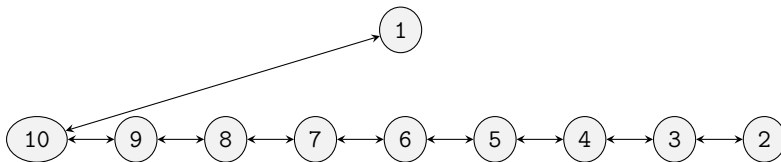


Today: pairing heap; §§23.*.

Next class: Midterm Exam 2.

1. Write your group members' names below. Underline your name.

2. (a) Use dashed lines to depict the *abstract tree* corresponding to the following concrete tree for a pairing heap (cf. textbook Fig. 23.4).
 (b) Explicitly depict the null nodes in the tree representation.



3. Consider an initially empty structure that is similar to a pairing heap, but that is maintained using a simple one-pass linking strategy in which subtrees are merged one at a time in left-to-right order.
 - (a) Trace the insertion of the keys 1, 2, ..., 10 into the heap of Question 2, depicting the intermediate trees after 2 and 5 insertions.
 - (b) Then trace two *deleteMin* operations.
 - (c) Then trace one *decreaseKey* operation that changes the key 7 to 2.

[additional space for answering the earlier question]

- Repeat Question 3 using a two-pass linking strategy that merges pairs of subtrees left to right in the first pass and then merges the merged pairs also in left-to-right order in the second pass. (In the second pass, we proceed left-to-right, merging the result of the previous merges in this pass with the next subtree.)

5. Repeat Question 4 using a right-to-left second pass. Explain any differences between this strategy and that of the textbook.