

## 1 Reading.

Chapter 6 (except 6.4–6.7); Chapter 11, Sections 2 and 4.

## 2 Problems.

1. In class we discussed a linear-time algorithm, *build-heap*, for building a binary heap from an unordered array. You wisely observed that the algorithm can be improved by skipping over nodes with no children.
  - (a) Give a closed-form formula for the first node that should be processed (as a function of  $n$ ). I.e., what should  $X$  be in the *build-heap* algorithm below (input: an unordered array):
    - view array as complete binary tree.
    - for  $i = X$  down to 1, *percolate-down*( $i$ ).
  - (b) Prove that your formula is correct.
2. Problem 6.16.
3. Problem 6.17.
4. Problem 6.31. Hint: first show that  $\binom{k}{d} + \binom{k}{d-1} = \binom{k+1}{d}$  then use induction.