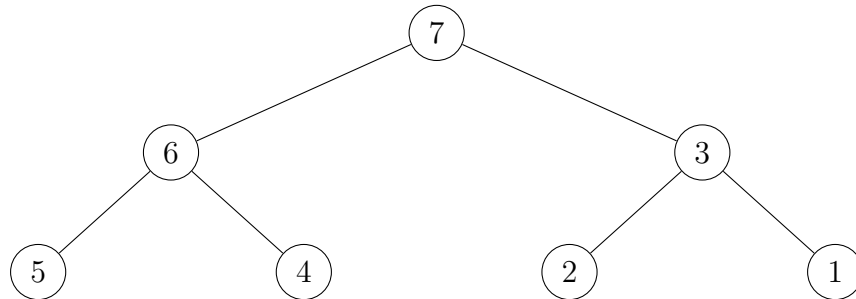


University of Waterloo
CS240R Fall 2017
Tutorial 2

Monday, September 25

Problem 1 - Heap Insert and Delete

Insert 17, then 8 on the heap below. Then perform delete-max on the original heap.



Problem 2 - Heapsort

Perform heapsort on the following array:

$A = [2520, 1982, 34800, 34000, 322, 159, 2845, 9]$

Problem 3 - Solving Recurrence

Chef Sajed is preparing a special order of n pancakes for the renowned food critic Benjamin. The pancakes are of distinct sizes, stacked in a tower with the smallest pancake at the top and the largest on the bottom. The chef then realizes that the plate is slightly cracked, and decides to transfer the pancakes to a new plate. In order to maintain the quality of the pancakes, the following conditions apply:

1. The pancakes can only be transferred one at a time very carefully, requiring 3 seconds per transfer.
2. A pancake can only be placed either directly on an empty plate, or on top of a larger pancake, to maintain flatness.
3. Since the kitchen is very busy, there are only three plates accessible in total (including the plate where the pancakes start from).

Assuming no time is wasted between transfers, calculate the time taken to transfer all n pancakes to a new plate.