Illinois Institute of Technology
Department of Computer Science

Homework Assignment 6

CS 430 Introduction to Algorithms
Spring Semester, 2018

Due: Monday, March 26

1. Prove that $A_3(j) \geq \text{tower}(j)$, where

$$\text{tower}(n) = \begin{cases} 2^{\text{tower}(n-1)} & \text{if } n > 0, \\ 1 & \text{if } n = 0. \end{cases}$$

2. Binomial heaps were discussed in the lecture of March 19, where algorithms for BINOMIAL-HEAP-EXTRACT-MIN, BINOMIAL-HEAP-DECREASE-KEY, and BINOMIAL-HEAP-DELETE were described in vague terms. Write these algorithms out in detail and give inputs that cause them (each) to run in $\Omega(\log n)$ time.

3. Problem 19-3 on page 529