15-451 Mini 3

Feb 19, 2008

This mini is due via *email* to your TA, by midnight Tuesday Feb 19.
Please use the subject line "15-451 MINI #3" in your email.
Questions/concerns/comments to Dafna Shahaf ⟨dshahaf+451@cs.cmu.edu⟩

1 Question 1: Treaps

Consider the following (key priority) pairs:

$$(a\ 4), (b\ 6), (c\ 1), (d\ 3), (e\ 2), (f\ 5)$$

1. Choose any ordering you would like on those elements (such as $< b, d, f, e, c, a >$) and illustrate inserting them into a treap, step by step, in that order. An ascii drawing is fine.

2. In what way, if any, does the final treap depend on the chosen ordering of insertions?

2 Question 2: Hashes

Consider the following two hash functions h1 and h2 from $\{1, 2, 3\}$ to $\{0, 1\}$:

	1	2	3
h1	0	0	1
h2	0	1	0

In other words, $h1(1) = 0$, $h1(2) = 0$, $h1(3) = 1$, $h2(1) = 0$, $h2(2) = 1$, $h2(3) = 0$. Is the set $H = \{h1, h2\}$ a universal hash family? Why or why not?