

CS 201 – Data Structures II (L1)

Quiz # 1

Question 1- 10 pts

You are given following numbers to be entered (in the given order) in an initially empty skiplist.

5 8 9 2 13 1 7 3 11

The outcome of a series of coin tosses is sampled below (top let to bottom right). You will keep entering new nodes to upper levels until you get Head (H).

T	T	H	H	T	H	T	T	H	T	T	T
H	H	T	H	T	H	H	H				

Build the skiplist and answer the following questions:

- What is the total number of nodes in this skiplist? This will include nodes at all levels excluding the sentinel nodes.
 - Total number of nodes:
- In how many levels (including level 0) do we have the following nodes?

5	<input type="text"/>
8	<input type="text"/>
9	<input type="text"/>
2	<input type="text"/>
13	<input type="text"/>
1	<input type="text"/>
7	<input type="text"/>
3	<input type="text"/>
11	<input type="text"/>

Question 2- 10 pts

A skiplist adds a new value to higher levels if the coin come up as 'Head'. Instead of using a fair coin, we decided to use an unfair coin with 3/4 probability of 'Tail'. What is the expected height of skiplist? Will it increase or decrease as compared to when a fair coin is used?