This exercise augments classroom discussion on skip lists in general, and Pugh's original paper[1] on the topic in particular.

1. List the members of your group below. Underline your name.

2. Trace the insertion of the following keys, in order of appearance, into an initially empty skip list using coin flips to determine whether a key appears at the next higher level. Heads means continue to next level; tail means done. For ease of comparing work, we will all use the the results of the coin flips indicated below. (Cross off the random bits as you use them.) Depict the state of the skip list at least after every four insertions.

   82 61 47 44 29 86 25 19 42 38 23 83 53 12 68 18 13 16 7 9

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   HHTHH THHTH HHHHH HTTHT THHTT HHHTH HHHTH HTHTH
   TTHTH HTHTH TTTTT HHHHT HTHHT THHHT HTHTT HHHTT
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[1]William Pugh, "Skip Lists: A Probabilistic Alternative to Balanced Trees," _Communications of the ACM_ 33/6 (1990).

[additional space for answering the earlier question]

3. List the linked-list cells examined by a search for each of the following keys in the final skip list of Question 2. We say a cell is examined if its key or link is used to determine further action by the search algorithm. Each level of a multi-level cell that is thus examined is counted separately here.

19 23 53 55 47 86 25 12 18 16

4. Trace the deletion of each of the following keys, in order of appearance, from the final skip list of Question 2, depicting the state of the list after each deletion.

86 23 19 47 53