1.

galiys@uw1-320-15:~/Assignment5$ g++ driver.cpp

galiys@uw1-320-15:~/Assignment5$ ./a.out

#faculty members: 10

contents:

-inf -inf -inf -inf -inf -inf

berger berger berger

cioch

erdly erdly erdly erdly erdly

fukuda

jackels

olson olson olson

stiber

sung

unknown unknown

zander zander

+inf +inf +inf +inf +inf +inf

deleting unknown

#faculty members: 9

contents:

-inf -inf -inf -inf -inf -inf

berger berger berger

cioch

erdly erdly erdly erdly erdly

fukuda

jackels

olson olson olson

stiber

sung

zander zander

+inf +inf +inf +inf +inf +inf

finding stiber = 1

create another list

finding stiber = 1

#faculty members: 9

cost of find = 104

2.

dlist's find cost = 6491439

mtflist's find cost = 66448

translist's find cost = 6422436

skip's find cost = 2013580

3. Skip lists are a probabilistic data structure, if the access of elements was random, then the Skip List should be the fastest of the four. It will search in worst case Log(n) time while all the other lists would be searching in at least Log(n) time. A skip list does not provide the absolute worst-case performance guarantees because it is always possible (though with very low probability) that the coin-flips used to build the skip list will produce a badly balanced structure.

O(log(n)) is the time that dominates in insertion and deletion. The expected number of levels in a skip list is O(log n). The reason is that at level 0 we have n keys, at level 1 we expect that n/2 keys survive, at level 2 we expect n/4 keys survive, and so forth. After O(log n) levels, there will be no keys left.