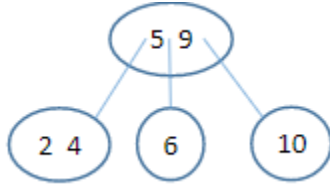


1. Given the following 2-3 tree, convert it into a LL red-black BST:



2. Assume we have a hash table with 9 entries, and the hash function is $x \bmod 9$.

a) Show the entries in the hash table after 1, 4, 8, 14, 22, 9 are inserted. Assume **separate chaining** is used.

b) Show the entries in the hash table after 1, 4, 8, 14, 22, 9 are inserted. Assume **linear probing** is used.

c) Assume **linear probing** is used.

Suppose now 10 is inserted. Now for the following searches, show the result of the search and how many entries need to be examined before the search return the result?

i) Search 5

ii) Search 15

iii) Search 19