CSE 2331 - Problem Set 5
Due beginning of lecture on November 6th

Problem numbers are from the third edition of "Introduction to algorithms". If unsure about which problem to solve, ask. Collaboration is permitted; looking for solutions from external sources (books, the web, etc.) is prohibited.

1. 11.2-2

2. Consider inserting the keys 10, 22, 31, 4, 15, 28, 17, 88, 59 into a hash table of length $m = 11$ using open addressing with the auxiliary hash function $h'(k) = k$. Illustrate the result of inserting these keys using linear probing (that is, the actual hash function is $h(k, i) = (h'(k) + i)$ mod m and the sequence of probed slots is $h(k, 0), h(k, 1), h(k, 2), \ldots$).

3. Construct a binary search tree (BST) storing the keys 1, 2, 3, 4, 5, 6, 7, 8, 9. Given your tree, explain what happens when you `TREE-DELETE` the root and give the resulting BST.

4. Construct a red-black tree (RBT) storing the keys 1, 2, 3, 4, 5, 6, 7, 8, 9. Given your tree, explain what happens when you `RB-INSERT` key 10. You can use the convention from the lecture, where a pair of concentric circles denotes a black node and a single circle denotes a red node.