1. Consider an AVL tree $T$ storing $n$ (key, value) pairs, and let $h$ denote the height of $T$. In the best case, $h$ is $O(\log n)$ and in the worst $h$ is $O(\log n)$ (use asymptotic notation).

2. Consider an AVL tree $T$ storing $n$ (key, value) pairs. The time for a restructure operation is $O(1)$ and the number of possible restructurings in a `remove(k)` operation is $O(\log n)$.

3. Draw an AVL tree that would result from inserting the following items in this order (assume the key and value are the same): 10, 20, 30, 40.

```
          20
        /   \
       10    30
       /     /
      /     40
```

4. Consider a Red-Black tree $T$ storing $n$ (key, value) pairs, a `put(k, v)` operation requires at most $O(1)$ restructurings, and a `remove(k, v)` operation requires at most $O(1)$ restructurings (use asymptotic notation).

5. When implementing the Multi-Map ADT, a Hash map with chaining is the preferred implementation, and when implementing the Sorted Set ADT, a red-black tree is the preferred implementation.