

Solutions to Review Questions 11

Topic: Set and Map ADTs

(for Reference only)

1. Explain whether the expression is true or false:

Feeling = {I, want, to, pass, this, exam, but, I, do, not, know, if, I, can, pass, it}

False. Set cannot contain replicated values.

2. What happens when you try to `add()` an element to a set that already contains it?

It returns false without change to the set.

3. What happens when you try to `remove()` an element from a set when it is not in the set?

It returns false without change to the set.

4. A map is also called

- (a) a table.
- (b) an associative array.
- (c) a dictionary.
- (d) all above**

5. An entry is a pair of <Key, value>.

6. The cardinality of a map is the number of entries, which equals to the number of keys in the map.

7. **True** or false:

A value may have more than one associated key.

8. What are the advantages and disadvantages of using a `HashMap` compared to a `TreeMap`?

A `HashMap` object is a hash table, so it provides nearly $O(1)$ access time for insertions, deletions, and searches. A `TreeMap` object is a balanced BST, so it provides $O(\log n)$ access time for insertions, deletions, and searches. Thus, a `HashMap` is faster but a `TreeMap` is ordered.