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CSC\_242\_Lab\_013\_QA

**(1)** Are dictionaries a mutable or an immutable type of a collections object?

**Dictionaries are mutable collections of key/value pairs with hashed keys that enable O(1) access.**

**(2)** What is meant by the acronym KV pair, that we often here in the realm of data processing?

**A key/value pair or KV pair refers to a pair of a hashed reference key and its value. In a correct application of a key value pair, O(1) access, removal, and updates should be possible.**

**(3)** Aside from a dictionary, what are the other types of collections that are used in Data Structures?

**We have lists, arrays, bags, trees, tuples, sets, queues, and more under the broad umbrella of “data structures”.**

**(4)** For this Salesperson's Commission Report application, we used a list to represent the values of a key. Can we use a list to represent a key within a dictionary?

**No, a list cannot be used as a key in a dictionary because a list is a mutable object and cannot be hashed by Python’s hashing algorithm (which runs underneath the dict class). If the list was converted into a tuple or string, it can be hashed.**

**(5)** Aside from computing salesperson commission amounts, what could be another application for which we can apply the theory of

our completed program?

**Any application that uses mutable, tabular data could employ dictionaries (or hash maps, as they are called in Java).**

**On the backend, a hashmap could be updated for instance each time an update is made to a database. That hashmap could be turned into JSON and yielded to the caller of a REST endpoint, who could then convert that JSON into the dictionary/map/object equivalent of the JSON in their language of choice.**