Lab 6.4 – Implement a Map using an ArrayList in Java

Learning Goals

1) Develop your understanding of a map data structure.
2) Develop your ability to implement objects composed of other objects.

Background

A **list** is useful for storing sequential data.

A **map**, in contrast, is useful for storing key, value pairs. For example, we can store a student's grade information using their name as a key.

Maps are a fundamental data structure available in all modern languages. They are called dictionaries in Python and are defined by {} in JSON documents.

The Java language provides robust support of **maps** through java.util.Map.

In this series of assignments, you will implement bca.util.BCAMap, a slightly simplified version of java.util.Map. (The primary simplifications being that bca.util.Map requires the key to be a String and does not support generics.)

Your Task

The interface **bca.util.BCAMap** has been defined.

Your task is to implement this interface with the class **BCAMapByArrayList**.

BCAMapByArrayList should have a single member variable **BCAArrayList list**.

You will need a supporting class, which we will create together, called BCAEntry. Instances of BCAEntry will be stored in the list, maintaining the correspondence between the key,value pairs.

Specifications for the methods of **BCAMapByArrayList** are provided in **bca.util.BCAMap**.

Testing

bca.util.BCAMapTest provides a basic set of test cases to verify the accuracy of your implementation.