Data Structures and Algorithms

Maps

Objectives

- Practice the use of maps as data structures to store data in memory as a set of KEY-VALUE pairs.

Background / Preparation

Maps

A map contains values on the basis of key, i.e. key and value pair. Each key and value pair is known as an entry. A Map contains unique keys.

A Map is useful if you have to search, update or delete elements on the basis of a key.

Assignment

You will have to develop a small command line program that reads from the user a **name** and an **age**, and store this data in a Map.

As maps need a combination of Key-Value pairs, the name and the age will be stored in a **Person** object that will generate automatically the ID of the record.

Finally, using the generated ID, the data will be stored in the map.

Also, a functionality should exits to allow the user to retrieve a record based on the ID provided.

Task 1: Create the class Person

This class will be in charge of modelling the record that will be stored in the map.

a. Include three attributes for this object: name, age and ID.
b. Include setters and getters for the attributes. The ID, should not have a setter, as this should be automatically generated.
c. A way to do the automatic ID generator, is having a static variable.
d. Include a toString method that allows to print the object to the console with some format and its full state.

Task 2: Create the Command Line Class

Your program must interact with the user with the aid of the buffered reader or scanner.

a. Your menu should have 3 options: add record, retrieve record, close the program.
b. If you want to implement validations, go for it, but you don't have to. Focus on getting the basic functionality done, assuming that the user will be good and will type in correct values.
c. Include a method to take the data from the user, create an instance of the Person class, and store it in the map using the generated ID as the key for the key-value pair. Don't forget to print the ID to the console, so the user knows the ID of the new record.
d. Include a method to retrieve record from the map. The user must type in an ID to search for in the map. If the record is not there, an appropriate error message should be displayed.