**The CD Exercise**

The purpose of this exercise is to make a system that keeps track of a collection of CDs. We work with three different classes: CDCollection, CD and Track.

I. The Track class

1. Start with the Track class. This class has two instance variable (attributes): **title** and **playing time**. Playing time is measured in seconds. You decide the data types of the attributes. Implement a **constructor** for the class, together with **get**- and **set**- methods.

II. The CD class

1. Add a new class, call it CD. This class has the following attributes: **cdNumber**, **title**, **year**, and a collection of **tracks**. The cdNumber attribute is an identifier for each CD in the collection. Title is the title of the CD. Year is the year the cd was published. A collection of tracks is an ArrayList which can contain objects of the type Track. Add a **constructor** that initializes the instance variables.

2. Make the **set**- and **get**- methods for the instance variables.

3. Add a method to the CD class that returns the track objects that has the longest playing time. Use the following header:

**public Track getLongestTrack()**

4. Add a method to the CD class that returns the average playing time for all the tracks on the CD.

5. Add a method to the CD class that returns the *number* of the tracks with a longer playing time than a given time - use the following header:

**public int getLongerPlayingTrackCount(int time)**

III. The CDCollection class

1. Make a new class called CDCollection. This class serves as a container for CD objects. Write a **constructor** and methods to **add** a CD to the collection.

2. Add a method that **deletes** a CD from the collection. You decide yourself on which criteria you want to delete on. (E.g. delete CDs with a certain title, a certain number, etc.)

3. Add a method to the CDCollection class that **counts the tracks with playing times exceeding 4 minutes** (tip: maybe you can use a method from the CD class).

4. Add a method, which given a title of a CD calculates **the total playing time** of the CD.

5. Add a method that calculates **the average playing time** for all the CDs in the collection.

6. Add a method that returns the **title of the longest track** of the CD. The method should take the title of the CD as input parameter.

7. Add a method that returns **the CD with the shortest track in the collection** (it might help you to make a method that can find the shortest track on a given CD).