Complex Systems Theory and Practice

Lab 0

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Note that the exercises below are suitable for solving even before the first lecture. It does not rely on any database knowledge, yet it assumes that you know the basics of file operations and data structures in a selected programming language. Due to the size of code overhead dynamically-typed or script languages may be preferred (try python or bash), yet for the simplicity of JSON/XML operations you may prefer languages like C++, Java or Rust. Note that some of the may be useful later on, during NoSQL tasks.

1. Using the selected programming language read the data from one of the files csv or json to perform the tasks below:

   (a) Count all the records in the database.
   (b) Print out all the unique names of the artists.
   (c) For each artist print out all the pairs (artist name, album title).
   (d) Print out all the tracks except the ones performed by `Queen`.
   (e) Print out all the audio files (both AAC and MPEG) that last between 275s and 400s.
   (f) Print out the name of the rock band that has performed the longest (in the terms of the sum of lengths) tracks.
   (g) Print out all the records for which the composer is not known.
   (h) For each media type, count the number of tracks of that type.
   (i) Print out all the records composed by a person named John, ensure that none of the records are repeated. Order the results alphabetically in terms of the track title.

2. Install a database engine (MariaDB will be used in the examples, yet any relational database is suitable) and download `Chinook` database from here. Try to import the data to the DBMS, you may skip the `Invoiceline` table.