ECS713 Group Project

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1 A Brief Guide

This program allows the user to download a relational database filled with 10,000 rows of information about the air quality of various cities around the world, as measured against parameters such as NO_x and CO_2 levels, as well as geographical information about the cities.

As such, the database is comprised of three tables – a 'measurements' table, a 'locations' table and a 'parameter' table.

The data harvester makes use of a REST API, provided by *OpenAQ.org*. This API provides access to various JSON dumps of information about air quality that are updated in real time. The API imposes an upper limit of 10,000 readings per request. In order to stress-test the program as much as the API allows, this program will read in 10,000 results to the measurements table.

The running of the program is simple, and can be decomposed into the following steps[1]:

1. Open the *Database.hs* file and, within the *initialiseDB* method on line 24, edit the password value to match that of on your setup for the Postgres user. It is set to "admin" as default.
2. Open an instance of PostgreSQL shell, and enter the following:

   ```
   CREATE DATABASE airqual_db;
   ```

3. Open an instance of Command Line, PowerShell or Terminal.
4. Navigate to the *functional-assignment* folder.
5. Enter the following to the prompt:

   ```
   stack run
   ```

[1]These instructions assume you already have PostgreSQL installed on your machine. If not then consult `https://www.postgresql.org/download/` for advice on how to install and set up PostgreSQL.

If you have another SQL-based RDBMS installed, such as SQLite, then you can opt to configure the program with this instead. This is done by importing the relevant HDBC module and altering line 24 in *Database.hs* to use the module's connect function, then follow the above from step 2 onwards.

The program will then proceed to make three requests to the OpenAQ API, and populate each of the tables with values requested from OpenAQ. The program will then perform a series of queries on the database to extract information about each reading and present it to the user in an easy-to-read format.

If using an instance of an SQL shell, and would prefer to make use of database functionality outside of the pre-defined methods, ensure that you run the following line before you perform any queries:

```
SET CLIENT_ENCODING TO 'utf-8';
```

This is because you will most likely find that characters that are not part of WIN1252 encoding will be returned in the query. Failure to perform this step will cause queries to also fail.

2 Access to Documentation

Access to documentation is provided on the following relative path from the functional-assignment directory:
./.stack-work/install/b5baaaa8/doc/index.html Happy breathing!