eCommerce Back-End Documentation

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1. Overview

The eCommerce database was set up using MySQL 8.0.31. It contains the following tables:

* USER: stores the verified user accounts of the eCommerce website

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| COLUMN | id | name | username | password | user\_type | profile\_picture | registration\_date |
| TYPE | INT | VARCHAR | VARCHAR | VARCHAR | TINYINT | LONGBLOB | INT |
| PRIMARY | YES | NO | NO | NO | NO | NO | NO |
| NULLABLE | NO | YES | NO | NO | NO | YES | YES |
| DEFAULT | N/A | None | None | None | 0 | None | 0 |

The USER table comes preloaded with 3 users of different types (admin, client and seller) in order to facilitate development and testing.

Credentials for all three are as follows (username/password):

Admin: admin/admin

Client: testclient/client

Seller: testseller/seller

The user types are defined as follows:

Admin: 0

Client: 1

Seller: 2

* PRODUCT: stores all the products sold by the eCommerce website

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| COLUMN | id | name | desc | price | available | image | rating |
| TYPE | INT | VARCHAR | VARCHAR | FLOAT | BOOL | LONGBLOB | FLOAT |
| PRIMARY | YES | NO | NO | NO | NO | NO | NO |
| NULLABLE | NO | NO | NO | NO | NO | YES | YES |
| DEFAULT | N/A | None | None | None | FALSE | None | 0 |

The PRODUCT table was populated using an existing dataset of electronic devices. In its initial state, the dataset’s price column is incomplete and is missing the ‘available’, ‘image’ and ‘rating’ columns.

To populate each product's ‘image’ attribute, I wrote a Python3 script that fetches the first available Bing Images picture it can find for each product name. The pictures are then stored locally and are inserted into the database with the help of an SQL Dump Generator program which I wrote in C.

The SQL Dump Generator takes the incomplete dataset and the absolute folder path of the downloaded images as inputs and creates an SQL Dump file containing the table creation of PRODUCT and the insertion of the processed, complete dataset.

1. Setup on local machine

To be able to run the web application on your local machine, it needs to access the Back End, which is not stored remotely using Cloud Services, but rather stored locally on your device.

In this section, the steps required to install and access the Back End on your local machine will be described in detail.

# Installing the database

The Back End uses a MySQL Database which needs to be installed and powered on for the application to be able to access its contents and display the products’ information for example.

Hence, you need to download and install MySQL Community Server via the link <https://dev.mysql.com/downloads/mysql/> where you can select the installation package that suits your system, by selecting your operating system type and version.

Graphical user interface, application

Description automatically generated

Once installed, make sure MySQL has been added to your PATH variable (<https://www.tutorialspoint.com/adding-mysql-to-windows-path>)

To check if it has been added correctly open a Terminal/ Command Prompt/ Windows Powershell and run the following command:

> mysql -- version

The expected output should be the version of your MySQL Server.

To access the database tables and be able to perform operations, the local server needs to be powered on. To achieve that, the following command needs to be run:

> mysqld -u root -p

If executed correctly and the password you entered matches the username ‘root’ , which was set up during the installation process, the server will now be up and running and you will enter the MySQL Command Line Interface within your terminal. While here, you will need to perform a few operations to set up the environment.

Firstly, let’s create the database schema on which we will operate. Run the following commands:

> CREATE DATABASE eCommerce;

> USE eCommerce;

Now, we need to create an administrator account for this database and give it all of the permissions available:

> CREATE USER ‘eComAdmin’@’localhost’ IDENTIFIED BY ‘admin’;

> GRANT ALL PRIVILEGES ON \*.\* TO ‘eComAdmin’@’localhost’ WITH GRANT OPTION;

# Populating the database

You will need Linux or macOS for this section.

If you already have the dump file configured, skip to the last paragraph of this section.

In this section, we will focus on uploading data onto the previously created database, for the web application to be able to perform operations on it.

The process itself has been streamlined drastically thanks to the auxiliary dump generator program which I wrote in C. Any number of rows can be inserted simultaneously into the database by executing only executing 2 commands within the terminal.

To get started, you have to identify where the ‘dumpGenerator’ program resides inside the resource package provided alongside this documentation.

Once you found the ‘dumpGenerator’ folder, enter the ‘src’ folder within it. Afterwards, right-click on the File Explorer/ Finder window and open another instance of Terminal and execute the following command:

> gcc main.c generator.c -o main

Now that we have compiled the source code, we will run the program by passing it the path to the product images (identify the folder containing folders of images labelled from 1 to 300 and copy its absolute path)

> ./main [ABSOLUTE PATH GOES HERE]

If the path provided was valid, the program will output a file with a .sql extension which will be used to populate the database with titles, descriptions, prices and pictures for 300 products. The file is called eCompDump.sql and is placed in the ‘out’ directory of ‘dumpGenerator’.

Now let’s use this generated file to populate the database. In another instance of Powershell/ Terminal, run the following command:

> mysql -u eComAdmin -p eCommerce < [ABSOLUTE PATH TO DUMP FILE GOES HERE]

# Starting up the Apache server

The last step in order for the Back End to be accesible by the web application is to start up the Apache server that exposes the dataset available locally using RESTful web services.

For this, simply open the eCommerce Back End IntelliJ project and run the ‘EcommerceApplication’.

If done successfully, the Front End will now be able to consume data exposed by the Back End and the web application will run optimally.

1. API Requests

The base URL for making API Requests is <http://localhost:6060>

The Java Back-End app needs to be running when an API Request is made. Otherwise, the request will fail.

1. User requests

**GET**

/user/getAll

Fetches all the registered users from the database.

Params: None

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| username | String |
| password | String |
| userType | Integer |
| profilePicture | ByteArray |
| registrationDate | Long |

**GET**

/user/getById/{id}

Fetches the user with the given ID. Returns null if user not found.

Params:

|  |  |  |
| --- | --- | --- |
| id | Integer | Path Variable |

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| username | String |
| password | String |
| userType | Integer |
| profilePicture | ByteArray |
| registrationDate | Long |

**GET**

/user/getByUsername/{username}

Fetches the user with the given username. Returns null if user not found.

Params:

|  |  |  |
| --- | --- | --- |
| username | String | Path Variable |

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| username | String |
| password | String |
| userType | Integer |
| profilePicture | ByteArray |
| registrationDate | Long |

**POST**

/user/add

Adds a valid user to the database.

Params:

|  |  |  |
| --- | --- | --- |
| User object | User type | RequestBody |

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| username | String |
| password | String |
| userType | Integer |
| profilePicture | ByteArray |
| registrationDate | Long |

**POST**

/user/addAll

Adds a list of valid users to the database.

Params:

|  |  |  |
| --- | --- | --- |
| User list | List of User type | RequestBody |

Result:

|  |  |
| --- | --- |
| User list | List of User type |

**DELETE**

/user/delete

Deletes an user from the database. If the user is not found, the operation has no effect.

Params:

|  |  |  |
| --- | --- | --- |
| id | Integer | RequestParam |

Result: None

**PUT**

/user/update

Updates the information of an user in the database. If the user is not found, the operation has no effect

Params:

|  |  |  |
| --- | --- | --- |
| User object | User type | RequestBody |

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| username | String |
| password | String |
| userType | Integer |
| profilePicture | ByteArray |
| registrationDate | Long |

1. Product requests

**GET**

/product/getAll

Fetches all the registered products from the database.

Params: None

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| desc | String |
| price | Float |
| available | Boolean |
| image | ByteArray |
| rating | Float |

**GET**

/product/getById/{id}

Fetches the product with the given ID. Returns null if product not found.

Params:

|  |  |  |
| --- | --- | --- |
| id | Integer | Path Variable |

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| desc | String |
| price | Float |
| available | Boolean |
| image | ByteArray |
| rating | Float |

**GET**

/product/getByName/{name}

Fetches the product with the given username. Returns null if product not found.

Params:

|  |  |  |
| --- | --- | --- |
| name | String | Path Variable |

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| desc | String |
| price | Float |
| available | Boolean |
| image | ByteArray |
| rating | Float |

**POST**

/product/add

Adds a valid product to the database.

Params:

|  |  |  |
| --- | --- | --- |
| Product object | Product type | RequestBody |

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| desc | String |
| price | Float |
| available | Boolean |
| image | ByteArray |
| rating | Float |

**POST**

/product/addAll

Adds a list of valid products to the database.

Params:

|  |  |  |
| --- | --- | --- |
| Product list | List of Product type | RequestBody |

Result:

|  |  |
| --- | --- |
| Product list | List of Product type |

**DELETE**

/product/delete

Deletes an product from the database. If the product is not found, the operation has no effect.

Params:

|  |  |  |
| --- | --- | --- |
| id | Integer | RequestParam |

Result: None

**PUT**

/product/update

Updates the information of an product in the database. If the product is not found, the operation has no effect

Params:

|  |  |  |
| --- | --- | --- |
| Product object | Product type | RequestBody |

Result:

|  |  |
| --- | --- |
| id | Integer |
| name | String |
| desc | String |
| price | Float |
| available | Boolean |
| image | ByteArray |
| rating | Float |

1. Important notes
2. References

Initial product dataset

<https://github.com/etano/productner/blob/master/Product%20Dataset.csv>

Spring Initialzr

## <https://start.spring.io>

Java Spring Boot documentation

<https://docs.spring.io/spring-boot/docs/current/reference/htmlsingle/>

MySQL documentation

<https://docs.oracle.com/en-us/iaas/mysql-database/doc/getting-started.html>