Simple API Server Manual

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- Date: Aug. 26, 2019
- Latest Update: Aug. 26, 2019

Introduction

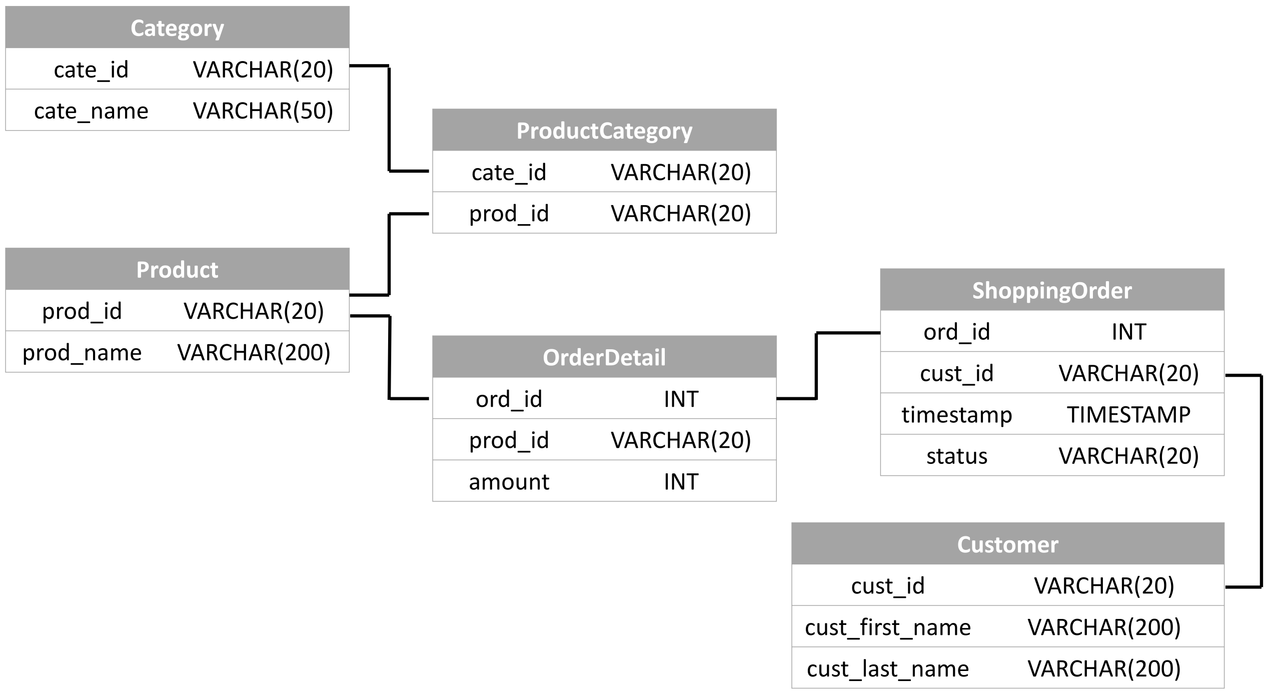
This is a simple API server application which depict a customer shopping order management system. The server provides API endpoints to get information from the database in the format of ***JSON***, **XML**, and ***CSV***.

The API server is implemented using ***Python-Flask*** with **Python 3.7**. A ***MariaDB (MySQL)*** open-source database software is utilized as the data storage. The testing dataset is arbitrarily created and inserted already into the database.

Please visit https://hipposerver.ddns.net:8805 **for a live demo!**

Database Design

The following is the database schema design:



Category	
cate_id	VARCHAR(20)
cate_name	VARCHAR(50)

ProductCategory	
cate_id	VARCHAR(20)
prod_id	VARCHAR(20)

Product	
prod_id	VARCHAR(20)
prod_name	VARCHAR(200)

OrderDetail	
ord_id	INT
prod_id	VARCHAR(20)
amount	INT

ShoppingOrder	
ord_id	INT
cust_id	VARCHAR(20)
timestamp	TIMESTAMP
status	VARCHAR(20)

Customer	
cust_id	VARCHAR(20)
cust_first_name	VARCHAR(200)
cust_last_name	VARCHAR(200)

Implemented API Endpoints

- Current API Version: ***v1***
- API Link: `/api/<API VER>/<API NAME>`
- Supported Output Format: ***JSON***, ***XML***, ***CSV***
- Default Parameters:

Name	Type	Description	Default
`page`	Integer	(***Pagination***) page number	1
`size`	Integer	(***Pagination***) number of items per page	10
`format`	Text	Return data format, values in ["**json**", "**xml**", "**csv**"]	json

- API Endpoints Links (All with Pagination enabled):

API NAME	Extra Parameters	Description
`/order/listOrder`	None	List all the received shopping orders.
`/order/showByID`	`ord_id`	Show the detail of an order by ID (`ord_id`).
`/order/orderByCustomer`	`cust_id`	Show orders by Customer using Customer ID (`cust_id`).
`/product/listProduct`	None	List all the products.
`/product/showByID`	`prod_id`	Show the detail of a product by ID (`prod_id`).
`/product/numOfSold`	`prod_id`	Show the number of sold per product, if product ID (`prod_id`) is given, return only the result with that ID.
`/product/numOfSoldByDate`	`start_date`, `end_date`, `range`, `prod_id`	Show the number of sold amount per product specified by a date range and grouping by `day`, `week`, or `month`. Parameter `start_date` and `end_date` are for the time filtering and `range` values in ["**day**", "**week**", "**month**"] to determine the grouping. If `range` is not specified, grouping by `date` is default. If a product Id (`prod_id`) is given, return the result only with that ID.
`/category/numOfSold`	`cate_id`	Show the number of sold per category, if category ID (`cate_id`) is given, return only the result with that ID.

API NAME	Extra Parameters	Description
`/category/purchasedByCustomer`	`cust_id`	Show the number of purchased amount in a certain category by a customer with ID (`cust_id`).

How to Run the Program

Step 1. Library Package Installation

Please make sure ***Python 3.6 or higher*** and ***MariaDB 5.7 or higher*** are installed on the machine. A `requirement.txt` file is for install the required library packages. Use the following command to install:

```
$ pip3 install -r requirements.txt
```

Step 2. Create the Testing Database

In this repository, a folder `SQL` contains **two** sql command files for creating the testing database. Execute the file `build_datbase.sql` first then `build_dataset.sql` by the following command:

```
$ mysql -u <USER> -p < build_database.sql
# then
$ mysql -u <USER> -p < build_dataset.sql
```

Alternatively, you may use the pre-built testing database dump (file `dump.sql`) to create the database with testing dataset. Restore database using the command:

```
$  mysql -u <USER> -p < dump.sql
```

Step 3. Change the Default Settings

In the program folder `API Code`, a file named `config.py` is for managing several global variables for the program. This include the database connection settings. Please change the **address**, **port**, **account**, and **account password** for accessing the previously created testing database on your machine.

Step 4. Start-up the server

After the database and testing dataset is ready, please navigate to the program folder `API Code`, a file named `app.py` is the program entry point. Use the following command to execute the program:

```
$ python3 app.py
```

If everything went well, you should see the following message:

```
 * Serving Flask app "app" (lazy loading)
 * Environment: production
   WARNING: This is a development server. Do not use it in a production
deployment.
   Use a production WSGI server instead.
 * Debug mode: on
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 670-415-666
```

Step 5. Access the API

Open up a web browser and head to the address:

```
http://<SERVER ADDR>:5000
```

The default address should be http://127.0.0.1:5000. This page should show parts of the documentation. To try the API endpoints, please use the following format:

```
http://<SERVER ADDR>:5000/api/<API Ver>/<ENDPOINT LINK>
```

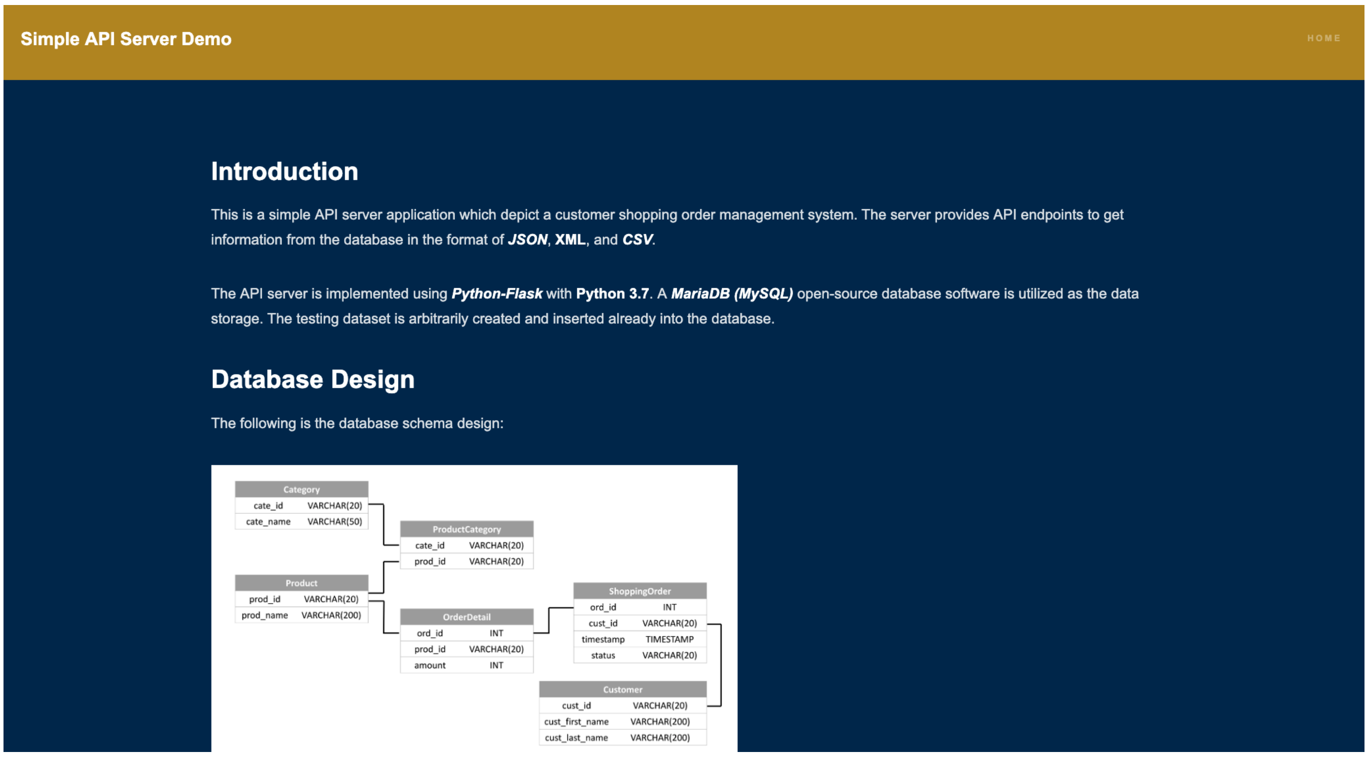
For example, to access the API `/order/listOrder`, use the address:
http://127.0.0.1:5000/api/v1/order/listOrder

To add parameters, please use the following format:

```
http://<SERVER ADDR>:5000/api/<API Ver>/<ENDPOINT LINK>?<PARA 1>=<VALUE>&
<PARA 2>=<VALUE>&...
```

For example, to **change output format to XML** of the previous example, use the address:
http://127.0.0.1:5000/api/v1/order/listOrder?format=xml

A simple welcoming page with the documentation should show up as follow:



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Program File Description

This section introduced the program fils within this project.

```
project
│   ReadMe.pdf:                     This manual
│   additional_questions.pdf:      My responses of additional questions
│   requirements.txt:               Records the reqired library packages
│   demo_server.png:                Image of the server screenshot
│   schema.png:                     Image of the database schema design
│
└───API Code
│   │   app.py:                     API server endpoint main program
│   │   config.py:                  Storing global variables and settings
│   │   query.py:                   Storing the function for db connection
│   │   sql_command.py:             Storing the SQL commands
│   │   utils.py:                   Stroing several utility functions
│   │
│   └───web
│       └───static:                 Store main page assets
│       │
│       └───templates:
│           │   index.html:         Server Main page
│           │   footer.html:        Footer information for index.html
│           │   documentation.md: Manual to show on index.html
│
└───SQL
    │   build_database.sql:         To build up the testing database
    │   build_dataset.sql:          To create the testing dataset
    │   dump.sql:                   Pre-built testing database dump
```