DATABASE SYSTEMS AND CLOUD COMPUTING

3rd Homework Assignment

Due on: January 9, 2023

In this homework, you will implement the REST API (swagger.json) in Python using the following modules:

- eventlet
- Flask
- flask-cors
- flask-socketio
- **pymongo** (You will use MongoDB in the homework)
- requests
- schedule
- websockets
- flask-swagger-ui
- kafka-python

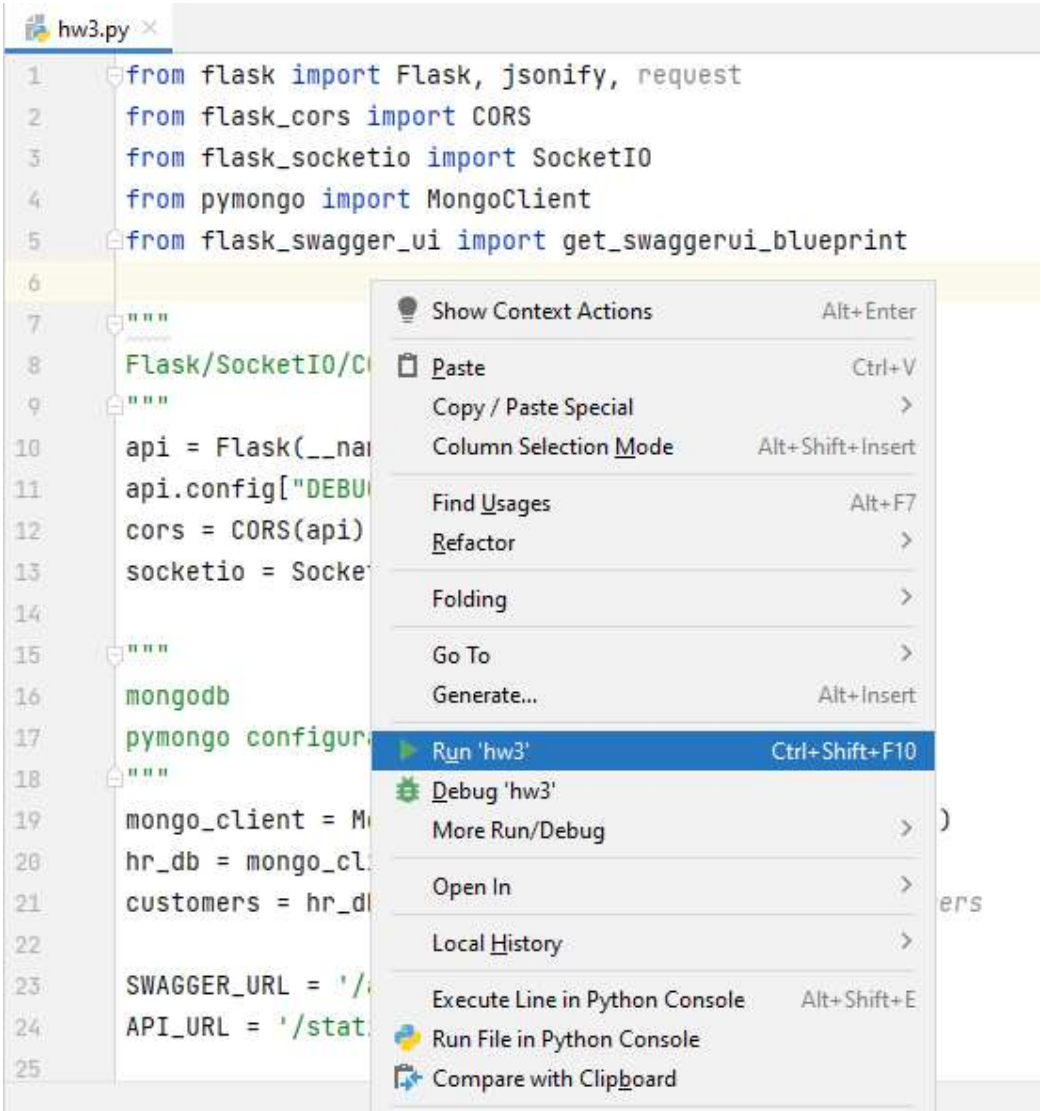
You can use the following template for the implementation:

```
from flask import Flask, jsonify, request
from flask_cors import CORS
from flask_socketio import SocketIO
from pymongo import MongoClient
from flask_swagger_ui import get_swaggerui_blueprint

"""
Flask/SocketIO/CORS configuration
"""
api = Flask(__name__)
api.config["DEBUG"] = True
cors = CORS(api)
socketio = SocketIO(api, cors_allowed_origins="*")

"""
mongodb
pymongo configuration
"""
mongo_client = MongoClient("mongodb://localhost:27017")
hr_db = mongo_client["crm"]  # use crm
customers = hr_db.customers  # collection name: customers

SWAGGER_URL = '/api/docs'
API_URL = '/static/swagger.json'

apiDoc = get_swaggerui_blueprint(
   SWAGGER_URL,
   API_URL,
   config={
      'app_name': "CRM"
   }
)
```

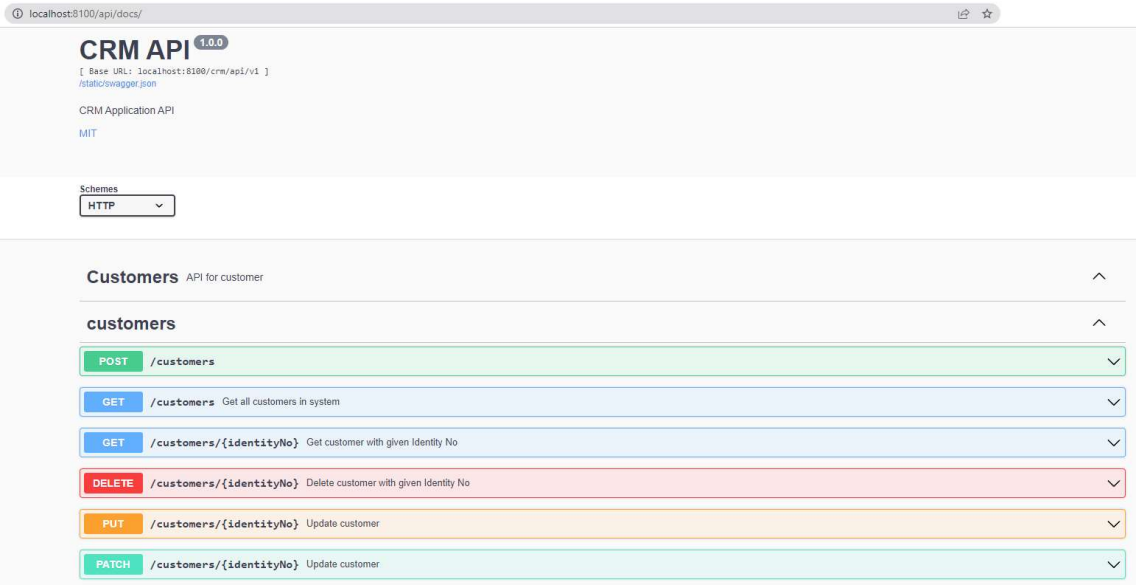
```
api.register_blueprint(apiDoc, url_prefix=SWAGGER_URL)

fields = [
    "_id", "firstName", "lastName", "photo", "email", "birthYear", "phones"
]


@api.route("/crm/api/v1/customers", methods=["GET"])
def get_customers():
    pass
    # TODO: get customers by pagination
    # TODO: return customers in the page as JSON


@api.route("/crm/api/v1/customers/<identity>", methods=["GET"])
def get_employee_by_identity(identity):
    pass
    # TODO: get customer by identity
    # TODO: return found customer as JSON


@api.route("/crm/api/v1/customers", methods=["POST"])
def add_customer():
    # TODO: create new customer
    # TODO: create an event and send it through Websocket and Kafka
    # TODO: Event: {"eventType": "CUSTOMER_ACQUIRED", "eventData": customer}
    return jsonify({"status": "ok"})


@api.route("/crm/api/v1/customers/<identity>", methods=["PUT"])
def update_customer(identity):
    # TODO: update customer
    return jsonify({"status": "ok"})


@api.route("/crm/api/v1/customers/<identity>", methods=["DELETE"])
def remove_customer(identity):
    # TODO: release a customer by identity
    # TODO: create an event and send it through Websocket and Kafka
    # TODO: Event: {"eventType": "CUSTOMER_RELEASED", "eventData": customer}
    # TODO: return removed customer as JSON
    pass


socketio.run(api, port=8100)
```

Task-1: Pull the template project from the following GitHub repository:
https://github.com/deepcloudlabs/ain3003-22.23-database.systems.and.cloud.computing/tree/main/homeworks/hw3/project

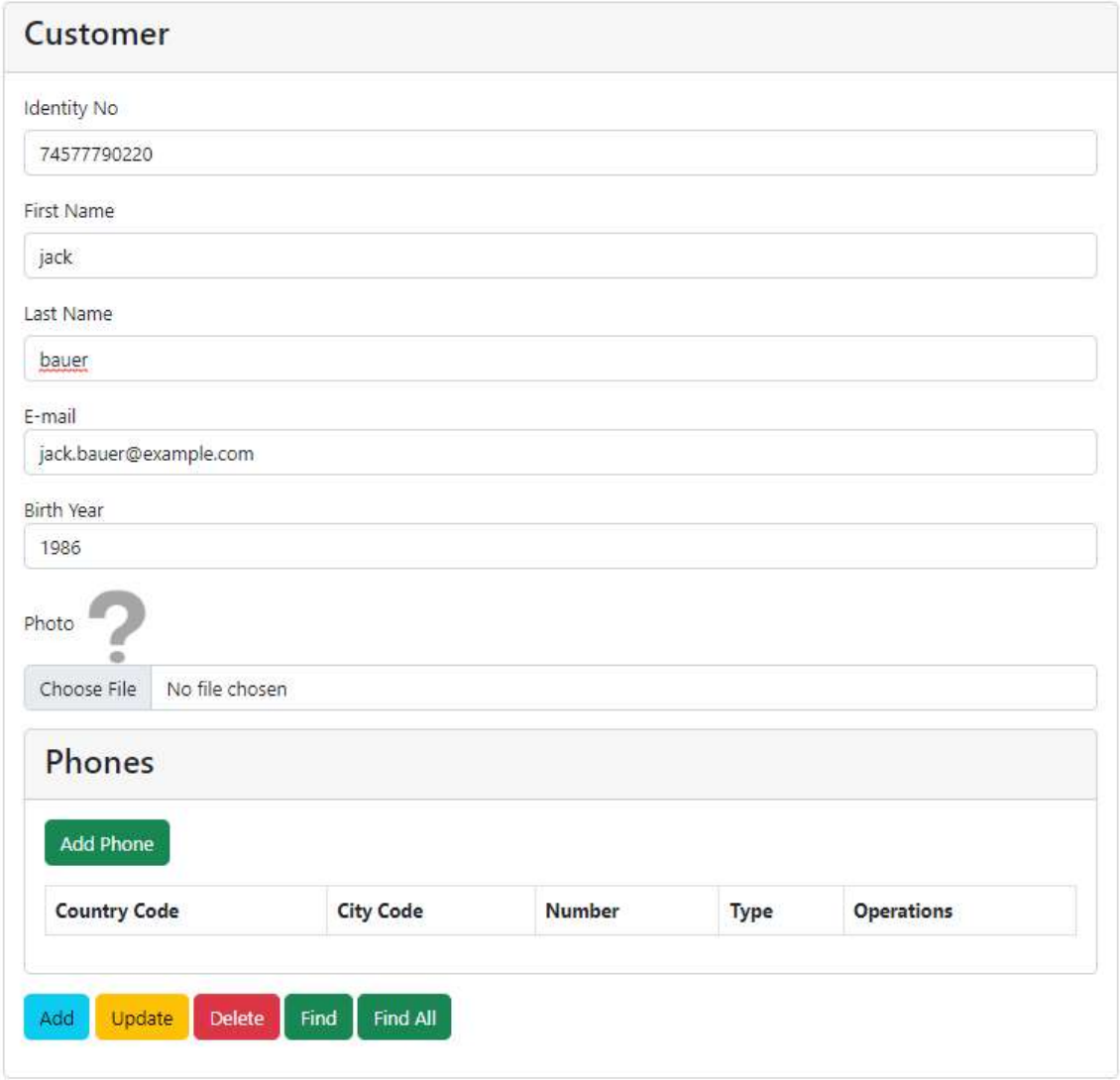
Task-2: Run the Python script h3.py:

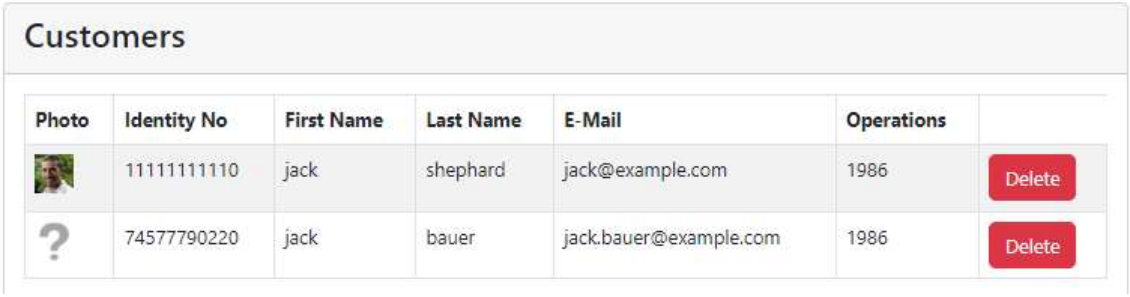


Task-3: After you run the script (hw3.py), open the following URL in a Web Browser: http://localhost:8100/api/docs

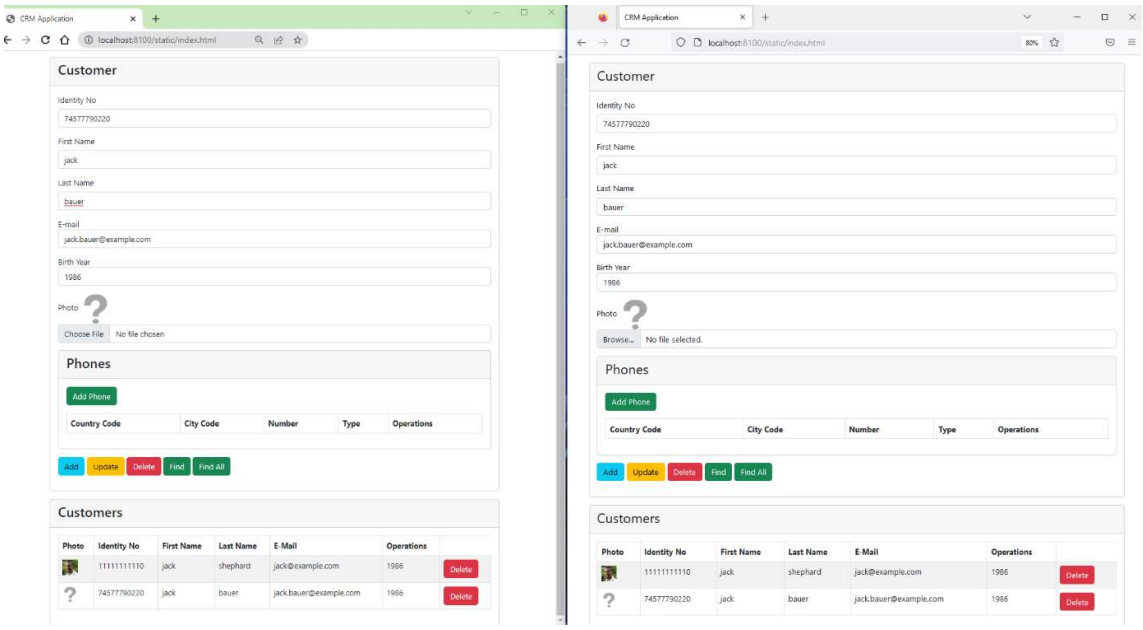


Task-4: After you run the script (hw3.py), open the following URL in a Web Browser: http://localhost:8100/static/index.html.
Implement the REST API endpoints and try to use the web application:





Task-5: Make sure that events are published in the backend by opening the web application in two different Web Browsers:



Add a new customer and remove a customer using the web application. Make sure that UI in the other Web Browser also updates the table automatically.

IMPORTANT

- Academic dishonesty, including but not limited to cheating, plagiarism, and collaboration, is unacceptable and subject to disciplinary action. Any student found guilty will have a grade of F. Assignments are due in class on the due date. Late assignments will generally not be accepted. Any exception must be approved. Approved late assignments are subject to a grade penalty.