

Clients Web Service - Multicert Development Challenge

This project was created for the take-home challenge issued by v. It is an implementation of a service meant to manage Clients. It is composed of two folder components:

- `multicertDevelopmentChallenge`, which is the folder that contains the web service and files for database deployment.
- `client`, which contains the client which allows interaction with the web service.

Installation And Running

Further down in this README there are better explanations on the nature and structure of this project, but as installation and running might be referenced more, I've decided to have it be the first section. In order to install this project it's only necessary Docker and Maven.

In the zip sent by email, a target folder containing a compile .jar file for the web service is already created. However, to build it simply open a terminal and type:

- mvn clean package

To run the application, open a terminal in the folder containing the client folder and the multicertDevelopmentChallenge folder and type:

- `docker-compose up`

If the application runs correctly you'll see the following in the terminal:

```

PostgreSQL init process complete; ready for start up.
db
db
2021-08-13 22:27:23.337 UTC [1] LOG: starting PostgreSQL 12.6 (Debian 12.6-1.pgdg100+1) on x86_64-pc-linux-gnu, compiled by gcc (Debian 8.3.0-6) 8.3.0, 64-bit
2021-08-13 22:27:23.337 UTC [1] LOG: listening on IPv4 address '0.0.0.0', port 5432
2021-08-13 22:27:23.337 UTC [1] LOG: listening on IPv6 address '::', port 5432
frontend-postal
2021/08/13 22:27:22 [notice] #1: start worker process 44
frontend-postal
2021/08/13 22:27:22 [notice] #1: start worker process 45
frontend-postal
2021/08/13 22:27:22 [notice] #1: start worker process 47
frontend-postal
2021/08/13 22:27:22 [notice] #1: start worker process 48
db
2021-08-13 22:27:23.341 UTC [1] LOG: listening on Unix socket "/var/run/postgresql/.s.PGSOCKET.5432"
db
2021-08-13 22:27:23.352 UTC [75] LOG: database system was shut down at 2021-08-13 22:27:23 UTC
db
2021-08-13 22:27:23.356 UTC [1] LOG: database system is ready to accept connections
frontend-postal
2021/08/13 22:27:22 [notice] #1: start worker process 49
webservice
webservice
webservice
webservice
webservice
webservice
webservice
:: Spring Boot :: (v2.5.3)
webservice
2021-08-13 22:27:24.522 INFO 1 --- [main] com.challenge.rest.Executable : Starting Executable v1.0-SNAPSHOT using Java 16-ea on 46927405bd34
2021-08-13 22:27:24.526 INFO 1 --- [main] com.challenge.rest.Executable : No active profile set, falling back to default profiles: default
2021-08-13 22:27:25.358 INFO 1 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port(s): 8080 (http)
2021-08-13 22:27:25.366 INFO 1 --- [main] o.apache.catalina.core.StandardEngine : Starting service [Tomcat]
2021-08-13 22:27:25.366 INFO 1 --- [main] org.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/9.0.50]
2021-08-13 22:27:25.411 INFO 1 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2021-08-13 22:27:25.412 INFO 1 --- [main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: Initialization completed in 819 ms
Opened database successfully
2021-08-13 22:27:25.769 INFO 1 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path ''
2021-08-13 22:27:25.777 INFO 1 --- [main] com.challenge.rest.Executable : Started Executable in 1.61 seconds (JVM running for 1.911)

```

Afterwards in localhost:9000 you'll see the home page of the client:

Client Manager Demo

Thank you for reviewing this application to the Multicert development software challenge.

In order to create clients, please select the "Create Client" option in the section of the navigation bar.

To view or delete clients, select the type of data display in the appropriate section of "List Clients". "Search Clients" allows one to look for clients based on the NIF or name of the client, and "All Clients" displays all clients. Both allow the deletion of a client through a button.

It is possible to navigate through the client by using the navbar that sorts through the components. If you'd prefer to use links, the components of the client are as such:

- /homepage is the homepage of the client
- /create-client is the page where a user may create a new client register
- /client-viewer is the page where a user may view all clients and delete specific registers
- /client-search is the page dedicated to searching for a client through NIF or name (only through exact search), and if desired, delete specific registers

In testing, one of the pcs used for testing showed the following error:

```

Building angular-frontend
[+] Building 20.8s (11/13)
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 32B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/node:latest
=> [internal] load metadata for docker.io/library/nginx:latest
=> [build 1/5] FROM docker.io/library/node:latest@sha256:678cad87833f51615213547acb719e951569816db7bb0e2bb7da10cbfcc976c
=> [internal] load build context
=> => transferring context: 2.90MB
=> [stage-1 1/3] FROM docker.io/library/nginx:latest@sha256:8f335768880da6baf72b70c701002b45f4932acae8d574dedfdaf967fc3a
=> CACHED [build 2/5] WORKDIR /usr/local/app
=> CACHED [build 3/5] COPY . /usr/local/app/
=> CACHED [build 4/5] RUN npm install
=> ERROR [build 5/5] RUN npm run build
-----
> [build 5/5] RUN npm run build:
#12 0.456
#12 0.456 > client@0.0.0 build
#12 0.456 > ng build
#12 0.456
#12 1.920 - Generating browser application bundles (phase: setup)...
#12 7.349 node:events:371
#12 7.349     throw er; // Unhandled 'error' event
#12 7.349     ^
#12 7.349
#12 7.349 Error: write EPIPE
#12 7.349     at afterWriteDispatched (node:internal/stream_base_commons:160:15)
#12 7.349     at writeGeneric (node:internal/stream_base_commons:151:3)
#12 7.349     at Socket._writeGeneric (node:net:780:11)
#12 7.349     at Socket._write (node:net:792:8)
#12 7.349     at writeOrBuffer (node:internal/streams/writable:389:12)
#12 7.349     at _write (node:internal/streams/writable:330:10)
#12 7.349     at Socket.Writable.write (node:internal/streams/writable:334:10)
#12 7.349     at Object.writeToStdin (/usr/local/app/node_modules/esbuild/lib/main.js:1723:19)
#12 7.349     at sendRequest (/usr/local/app/node_modules/esbuild/lib/main.js:617:14)
#12 7.349     at start (/usr/local/app/node_modules/esbuild/lib/main.js:1252:9)
#12 7.349 Emitted 'error' event on Socket instance at:
#12 7.349     at emitErrorNT (node:internal/streams/destroy:157:8)
#12 7.349     at emitErrorCloseNT (node:internal/streams/destroy:122:3)
#12 7.349     at processTicksAndRejections (node:internal/process/task_queues:83:21)
#12 7.349     at runNextTicks (node:internal/process/task_queues:65:3)
#12 7.349     at processImmediate (node:internal/timers:437:9) {
#12 7.349   errno: -32,
#12 7.349   code: 'EPIPE',
#12 7.349   syscall: 'write'
#12 7.349 }
-----
executor failed running [/bin/sh -c npm run build]: exit code: 1
ERROR: Service 'angular-frontend' failed to build : Build failed

```

If this occurs (or a similar error at the same step mentioning CSS Minimizer) please remove the line "RUN npm run build" from the dockerfile in the "client" folder, and type docker-compose up again.

Database

The database was developed using PostgreSQL, and is composed of one tables

- client - A table that contains the clients registered. It is composed of the columns "client_name", which contains the varchar with the name of the client, "client_nif" and "phone_number" which are var chars with a maximum of 9 characters containing the NIF and phone number of the client (the NIF must be at least 9 characters and so is the phone number if it's a portuguese phone number, which is assumed if they have a NIF), and finally "client_address", which contains a varchar containing the address of the client.

The creation of the database is denoted in the file "create.sql", it also populates the database, and is meant to be initiated through Docker.

The database contains the following constraints, meant to maintain the consistency of the data.

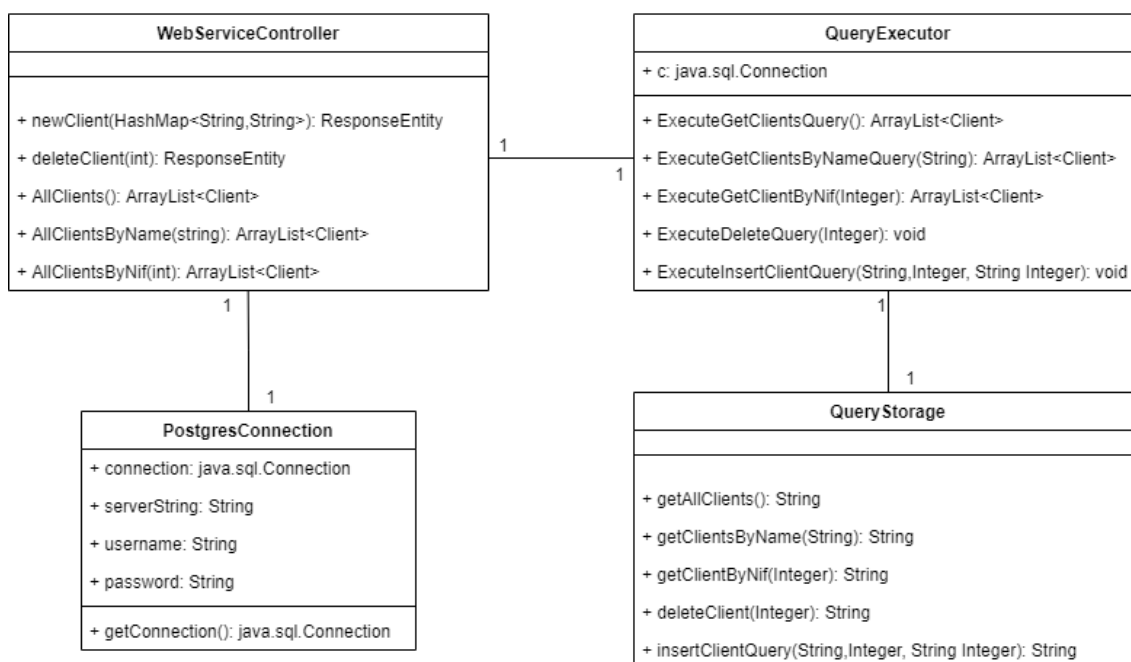
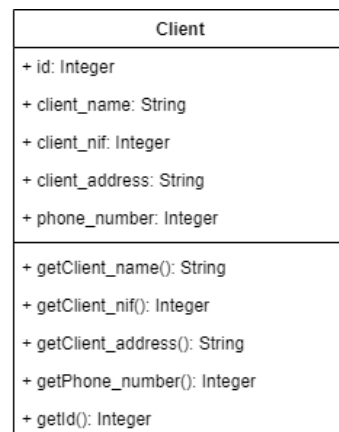
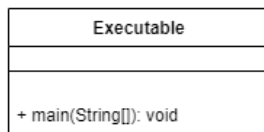
- `check_nif_length` and `check_phone_length`, these constraints are meant to make sure both the NIF and the phone number have 9 digits.

Web Service

The Web Service was developed through the use of Java and Spring. It contains a REST API with endpoints so that the Client can perform operations without directly being linked to the database. It contains the following packages in `src/main/java/com/challenge`:

- `models`, meant to store models to create json. There is a singular model:
 - `Client`, meant to model clients
- `postgres`, which contains classes necessary to connect and query a postgresql database.
- `queries`, which stores all necessary queries on the class `QueryStorage`.
- `rest`, which contains the web service executable class in `Executable` and the Controller for the Rest API in `WebServiceController`.

The classes and their interactions can be viewed in the following Class UML Diagram:



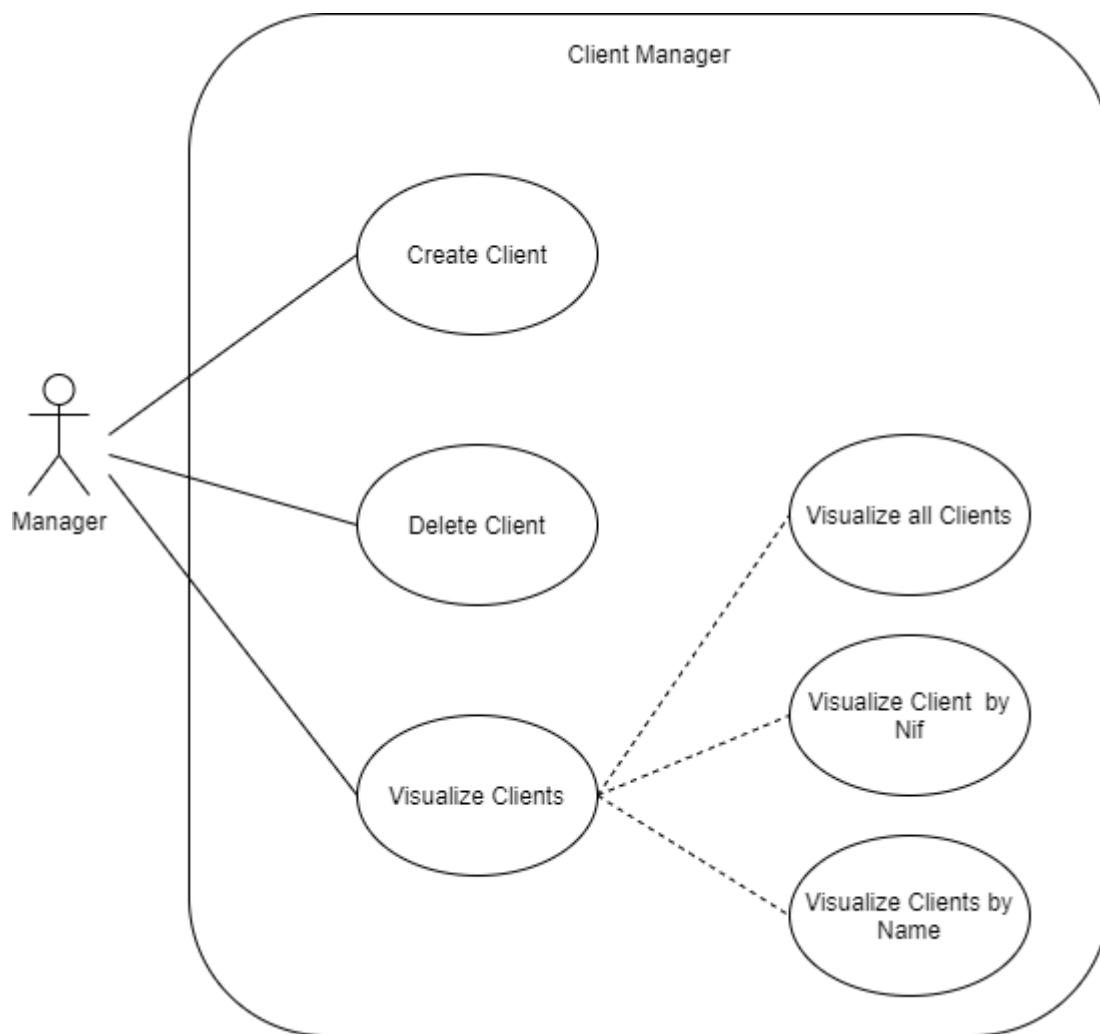
Client

The Client was developed using HTML, CSS, Angular, Bootstrap and JQuery.

It is composed of the following Angular Components, which all load the navbar component, which contains a navigation bar to go between them:

- home-page - The starting page of the client
- create-client - Which allows a user to create a client
- client-viewer - This component allows a user to view all client registers, or delete a specific client
- client-search - This component allows a user to search for a client register by name or NIF, and delete them if they wish

The client allows for all use cases which can be viewed in the following diagram:



Testing

Unit Testing was developed for the database interactions and querying through Junit 4 and Mockito, the tests are stored and executed in the QueryExecutorTest class.

-- Nuno Freitas