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Rapport_Flask

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Sommaire

1.1 Qu'est-ce qu'une API ?

Les API (Application Programming Interfaces) Web sont des outils permettant de rendre de l'information et des fonctionnalités accessibles via internet.

Une API web permet à de l'information et à des fonctionnalités d'être manipulées par des programmes informatiques via internet.

1.2 Flask

• Flash est un cadre de travail (framework) Web pour Python. Ainsi, il fournit des fonctionnalités permettant de construire des applications Web, ce qui inclut la gestion des requêtes HTTP et des canevas de présentation.

• Nous allons créer une application Flask très simple, à partir de laquelle nous construirons notre API.

1.2.1 Pourquoi Flask ?

• Python dispose de plusieurs cadres de développement permettant de produire des pages Web et des API.

• Le plus connu est Django, qui est très riche.

• Django peut toutefois être écrasant pour les utilisateurs non expérimentés.

• Les applications Flask sont construites à partir de canevas très simples et sont donc plus adaptées au prototypage d'APIs.

1.3 Mise en œuvre

1.3.1 MySQL

Installation de MySQL

Tout d'abord il vous faudra installer le paquet MySQL-server en tapant la commande suivante :

#apt install mysql-server

1.3.2 Python

Installation de python3 sous linux

Pour installer python3, on exécute la commande suivante :

#apt install python3

```
root@nasry-ahamadi:~# apt install python3
Lecture des listes de paquets... Fait
Construction de l'arbre des dépendances
Lecture des informations d'état... Fait
python3 est déjà la version la plus récente (3.6.7-1~18.04).
python3 passé en « installé manuellement ».
Les paquets suivants ont été installés automatiquement et ne sont plus nécessaires :
  gir1.2-goa-1.0 gir1.2-snapd-1
```

1.3.3 Installation de pip3

Pour installer pip3, on installe le paquet suivant :

#apt install python3-pip

```
root@nasry-ahamadi:~/tpcrudpython# apt install python3-pip
Lecture des listes de paquets... Fait
Construction de l'arbre des dépendances
Lecture des informations d'état... Fait
Les paquets suivants ont été installés automatiquement et ne sont plus nécessaires :
  gir1.2-goa-1.0 gir1.2-snapd-1
Veuillez utiliser « apt autoremove » pour les supprimer.
Les paquets supplémentaires suivants seront installés :
  build-essential dh-python dpkg-dev fakeroot g++ g++-7 gcc gcc-7 libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan4
  libatomic1 libc-dev-bin libc6-dev libcilkrts5 libexpat1-dev libfakeroot libgcc-7-dev libitm1 liblsan0 libmpx2 libpython3-dev libpython3.6-dev
  libquadmath0 libstdc++-7-dev libtsan0 libubsan0 linux-libc-dev make manpages-dev python-pip-whl python3-dev python3-distutils python3-lib2to3
  python3-setuptools python3-wheel python3.6-dev
Paquets suggérés :
  debian-keyring g++-multilib g++-7-multilib gcc-7-doc libstdc++6-7-dbg gcc-multilib autoconf automake libtool flex bison gcc-doc gcc-7-multilib
  gcc-7-locales libgcc1-dbg libgomp1-dbg libitm1-dbg libatomic1-dbg libasan4-dbg liblsan0-dbg libtsan0-dbg libubsan0-dbg libcilkrts5-dbg libmpx2-dbg
  libquadmath0-dbg glibc-doc libstdc++-7-doc make-doc python-setuptools-doc
Les NOUVEAUX paquets suivants seront installés :
  build-essential dh-python dpkg-dev fakeroot g++ g++-7 gcc gcc-7 libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan4
  libatomic1 libc-dev-bin libc6-dev libcilkrts5 libexpat1-dev libfakeroot libgcc-7-dev libitm1 liblsan0 libmpx2 libpython3-dev libpython3.6-dev
  libquadmath0 libstdc++-7-dev libtsan0 libubsan0 linux-libc-dev make manpages-dev python-pip-whl python3-dev python3-distutils python3-lib2to3
  python3-pip python3-setuptools python3-wheel python3.6-dev
0 mis à jour, 39 nouvellement installés, 0 à enlever et 0 non mis à jour.
Il est nécessaire de prendre 78,7 Mo dans les archives.
Après cette opération, 206 Mo d'espace disque supplémentaires seront utilisés.
Souhaitez-vous continuer ? [O/n]
```

1.3.4 Installation du connecteur pymysql

Installation de pymysql

Pour installer pymysql, il faudra installer le paquet suivant :

#pip3 install pymysql

```
root@nasry-ahamadi:~/tpcrudpython# pip3 install pymysql
The directory '/home/nasry/.cache/pip/http' or its parent directory is not owned by the current user and the cache has been disabled. Please check the pe
rmissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
The directory '/home/nasry/.cache/pip' or its parent directory is not owned by the current user and caching wheels has been disabled. check the permissio
ns and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
Collecting pymysql
  Downloading https://files.pythonhosted.org/packages/4f/52/a115fe175028b058df353c5a3d5290b71514a83f67078a6482cff24d6137/PyMySQL-1.0.2-py3-none-any.whl (
43kB)
    100% |████████████████████████████████| 51kB 849kB/s
Installing collected packages: pymysql
Successfully installed pymysql-1.0.2
root@nasry-ahamadi:~/tpcrudpython#
```

Pour pouvoir se connecter sur notre serveur de base de données MySQL :

root@nasry-ahamadi:/var/www/html/python-cgi# mysql -u root -p

```
root@nasry-ahamadi:/var/www/html/python-cgi# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.7.42-0ubuntu0.18.04.1-log (Ubuntu)

Copyright (c) 2000, 2023, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```

Création de la base de données banque :

mysql> create database banque;

```
mysql> create database banque;
Query OK, 1 row affected (0,00 sec)

mysql>
```

On se place dans la base de données banque :

mysql> use banque;

```
mysql> use banque;
Database changed
mysql>
```

Création de la table client :

mysql> create table client(id int primary key auto_increment,prenom varchar(50),nom varchar(60),code varchar(4),numcompte varchar(40),solde varchar(30));

```
mysql> create table client(id int primary key auto_increment,prenom varchar(50),nom varchar(60),code varchar(4),numcompte
varchar(40),solde varchar(30));
Query OK, 0 rows affected (0,02 sec)

mysql>
```

Description de la table client :

mysql> desc client;

```
mysql> desc client;
+-----------+-------------+------+-----+---------+----------------+
| Field     | Type        | Null | Key | Default | Extra          |
+-----------+-------------+------+-----+---------+----------------+
| id        | int(11)     | NO   | PRI | NULL    | auto_increment |
| prenom    | varchar(50) | YES  |     | NULL    |                |
| nom       | varchar(60) | YES  |     | NULL    |                |
| code      | varchar(4)  | YES  |     | NULL    |                |
| numcompte | varchar(40) | YES  |     | NULL    |                |
| solde     | varchar(30) | YES  |     | NULL    |                |
+-----------+-------------+------+-----+---------+----------------+
6 rows in set (0,00 sec)

mysql>
```

Affichage des utilisateurs déjà créé :

mysql> select user from mysql.user;

```
mysql> select user from mysql.user;
+------------------+
| user             |
+------------------+
| admin            |
| bouki1           |
| nasry            |
| debian-sys-maint |
| mysql.session    |
| mysql.sys        |
| root             |
+------------------+
7 rows in set (0,00 sec)

mysql>
```

1.3.5 Installation des paquets flask

root@nasry-ahamadi:~/ingenieur# pip3 install flask

```
root@nasry-ahamadi:~/ingenieur# pip3 install flask
The directory '/home/nasry/.cache/pip/http' or its parent directory is not owned by the current user and the cache has been disabled. Please check the pe
rmissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
The directory '/home/nasry/.cache/pip' or its parent directory is not owned by the current user and caching wheels has been disabled. check the permissio
ns and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
Collecting flask
  Downloading https://files.pythonhosted.org/packages/cd/77/59df23681f4fd19b7cbbb5e92484d46ad587554f5d490f33ef907e456132/Flask-2.0.3-py3-none-any.whl (95
kB)
    100% |████████████████████████████████| 102kB 220kB/s
Collecting itsdangerous>=2.0 (from flask)
  Downloading https://files.pythonhosted.org/packages/9c/96/26f935afba9cd6140216da5add223a0c465b99d0f112b68a4ca426441019/itsdangerous-2.0.1-py3-none-any.
whl
Collecting click>=7.1.2 (from flask)
  Downloading https://files.pythonhosted.org/packages/4a/a8/0b2ced25639fb20cc1c9784de90a8c25f9504a7f18cd8b5397bd61696d7d/click-8.0.4-py3-none-any.whl (97
kB)
    100% |████████████████████████████████| 102kB 47kB/s
Collecting Jinja2>=3.0 (from flask)
  Downloading https://files.pythonhosted.org/packages/20/9a/e5d9ec41927401e41aea8af6d16e78b5e612bca4699d417f646a9610a076/Jinja2-3.0.3-py3-none-any.whl (1
33kB)
    100% |████████████████████████████████| 143kB 437kB/s
Collecting Werkzeug>=2.0 (from flask)
  Downloading https://files.pythonhosted.org/packages/f4/f3/22afbdb20cc4654b10c98043414a14057cd27fdba9d4ae61cea596000ba2/Werkzeug-2.0.3-py3-none-any.whl
(289kB)
    100% |████████████████████████████████| 296kB 503kB/s
Collecting importlib-metadata; python_version < "3.8" (from click>=7.1.2->flask)
  Downloading https://files.pythonhosted.org/packages/a0/a1/b153a0a4caf7a7e3f15c2cd56c7702e2cf3d89b1b359d1f1c5e59d68f4ce/importlib_metadata-4.8.3-py3-non
e-any.whl
Collecting MarkupSafe>=2.0 (from Jinja2>=3.0->flask)
```

root@nasry-ahamadi:~/ingenieur# pip3 install flask_restx

```
root@nasry-ahamadi:~/ingenieur# pip3 install flask_restx
The directory '/home/nasry/.cache/pip/http' or its parent directory is not owned by the current user and the cache has been disabled. Please check the pe
rmissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
The directory '/home/nasry/.cache/pip' or its parent directory is not owned by the current user and caching wheels has been disabled. check the permissio
ns and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
Collecting flask_restx
  Downloading https://files.pythonhosted.org/packages/0e/74/1b871716adffdf7b7f65ce83f33722eabde72cc9820f8be95e9265dad013/flask_restx-1.1.0-py2.py3-none-a
ny.whl (2.8MB)
    100% |████████████████████████████████| 2.8MB 304kB/s
Requirement already satisfied: Flask!=2.0.0,>=0.8 in /usr/local/lib/python3.6/dist-packages (from flask_restx)
Requirement already satisfied: pytz in /usr/lib/python3/dist-packages (from flask_restx)
Collecting jsonschema (from flask_restx)
  Downloading https://files.pythonhosted.org/packages/e0/d9/05587ac378b9fd2c352c6f024f13240168365bd753a7e8007522b7025267/jsonschema-4.0.0-py3-none-any.wh
l (69kB)
    100% |████████████████████████████████| 71kB 1.0MB/s
Collecting aniso8601>=0.82 (from flask_restx)
  Downloading https://files.pythonhosted.org/packages/e3/04/e97c12dc034791d7b504860acfcdd2963fa21ae61eaca1c9d31245f812c3/aniso8601-9.0.1-py2.py3-none-any
.whl (52kB)
    100% |████████████████████████████████| 61kB 945kB/s
Requirement already satisfied: werkzeug!=2.0.0 in /usr/local/lib/python3.6/dist-packages (from flask_restx)
Requirement already satisfied: click>=7.1.2 in /usr/local/lib/python3.6/dist-packages (from Flask!=2.0.0,>=0.8->flask_restx)
Requirement already satisfied: Jinja2>=3.0 in /usr/local/lib/python3.6/dist-packages (from Flask!=2.0.0,>=0.8->flask_restx)
Requirement already satisfied: itsdangerous>=2.0 in /usr/local/lib/python3.6/dist-packages (from Flask!=2.0.0,>=0.8->flask_restx)
Requirement already satisfied: importlib-metadata; python_version < "3.8" in /usr/local/lib/python3.6/dist-packages (from jsonschema->flask_restx)
Collecting pyrsistent!=0.17.0,!=0.17.1,!=0.17.2,>=0.14.0 (from jsonschema->flask_restx)
  Downloading https://files.pythonhosted.org/packages/6c/19/1af501f6f388a40ede6d0185ba481bdb18ffc99deab0dd0d092b173bc0f4/pyrsistent-0.18.0-cp36-cp36m-man
ylinux1_x86_64.whl (117kB)
    100% |████████████████████████████████| 122kB 1.1MB/s
Collecting attrs>=17.4.0 (from jsonschema->flask_restx)
```

root@nasry-ahamadi:~/ingenieur# pip3 install jsonify

```
root@nasry-ahamadi:~/ingenieur# pip3 install jsonify
The directory '/home/nasry/.cache/pip/http' or its parent directory is not owned by the current user and the cache has been disabled. Please check the pe
rmissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
The directory '/home/nasry/.cache/pip' or its parent directory is not owned by the current user and caching wheels has been disabled. check the permissio
ns and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
Collecting jsonify
  Downloading https://files.pythonhosted.org/packages/63/5d/44962520aa458852bbd40ac5553dd1431f6367ab31f39ee7650b57136d9a/jsonify-0.5.tar.gz
Installing collected packages: jsonify
  Running setup.py install for jsonify ... done
Successfully installed jsonify-0.5
root@nasry-ahamadi:~/ingenieur#
```

1.3.6 Création de notre projet.

1.3.7 Création du crud.

On va créer un projet apicrud.

root@nasry-ahamadi:~# mkdir apicrud

root@nasry-ahamadi:~# cd apicrud/

```
root@nasry-ahamadi:~# mkdir apicrud
root@nasry-ahamadi:~# cd apicrud/
root@nasry-ahamadi:~/apicrud#
```

1.3.7.1 Programme d'insertion

root@nasry-ahamadi:~/apicrud# vim crud.py

```
root@nasry-ahamadi:~/apicrud# vim crud.py
root@nasry-ahamadi:~/apicrud#
```

```
#!/usr/bin/python3

import pymysql

def database():
    global conn,curseur
    conn=pymysql.connect(host='localhost',user='nasry',passwd='passer',database='banque')
    curseur=conn.cursor()

def creation(prenom,nom,code,numcompte,solde):
    database()
    sql="insert into client(prenom,nom,code,numcompte,solde) values (%s,%s,%s,%s,%s)"
    val=(prenom,nom,code,numcompte,solde)
    curseur.execute(sql,val)
    conn.commit()
    return "insertion reussie"

creation("Ahamadi","Nasry","1111","1001","200000")
```

Test :

root@nasry-ahamadi:~/apicrud# python3 crud.py

```
root@nasry-ahamadi:~/apicrud# python3 crud.py
root@nasry-ahamadi:~/apicrud#
```

mysql> select * from client;

```
mysql> select * from client;
+----+---------+-------+------+-----------+--------+
| id | prenom  | nom   | code | numcompte | solde  |
+----+---------+-------+------+-----------+--------+
|  1 | Ahamadi | Nasry | 1111 | 1001      | 200000 |
+----+---------+-------+------+-----------+--------+
1 row in set (0,00 sec)

mysql>
```

1.3.7.2 Programme d'affichage.

root@nasry-ahamadi:~/apicrud# vim crud.py

```
root@nasry-ahamadi:~/apicrud# vim crud.py
root@nasry-ahamadi:~/apicrud#
```

```
def lecture():
    database()
    sql="select * from client"
    curseur.execute(sql)
    tab=curseur.fetchall()
    return(tab)

print(lecture())
```

Test :

root@nasry-ahamadi:~/apicrud# python3 crud.py

```
root@nasry-ahamadi:~/apicrud# python3 crud.py
((1, 'Ahamadi', 'Nasry', '1111', '1001', '200000'),)
root@nasry-ahamadi:~/apicrud#
```

1.3.7.3 Programme de modification.

root@nasry-ahamadi:~/apicrud# vim crud.py

```
root@nasry-ahamadi:~/apicrud# vim crud.py
root@nasry-ahamadi:~/apicrud#
```

```
def update(prenom,nom,solde):
    database()
    sql="update client set solde=%s where prenom=%s and nom=%s"
    val=(solde,prenom,nom)
    curseur.execute(sql,val)
    conn.commit()
    return "mise a jour reussie"

update("Ahamadi","Nasry","500000")
```

Test :

root@nasry-ahamadi:~/apicrud# python3 crud.py

```
root@nasry-ahamadi:~/apicrud# python3 crud.py
root@nasry-ahamadi:~/apicrud#
```

Avant modification :

mysql> select * from client;

```
mysql> select * from client;
+----+---------+-------+------+-----------+--------+
| id | prenom  | nom   | code | numcompte | solde  |
+----+---------+-------+------+-----------+--------+
|  1 | Ahamadi | Nasry | 1111 | 1001      | 200000 |
+----+---------+-------+------+-----------+--------+
1 row in set (0,00 sec)

mysql>
```

Apres modification :

mysql> select * from client;

```
mysql> select * from client;
+----+---------+-------+------+-----------+--------+
| id | prenom  | nom   | code | numcompte | solde  |
+----+---------+-------+------+-----------+--------+
|  1 | Ahamadi | Nasry | 1111 | 1001      | 500000 |
+----+---------+-------+------+-----------+--------+
1 row in set (0,00 sec)

mysql>
```

1.3.7.4 Programme de suppression.

root@nasry-ahamadi:~/apicrud# vim crud.py

```
root@nasry-ahamadi:~/apicrud# vim crud.py
root@nasry-ahamadi:~/apicrud#
```

```
def delete(numcompte):
    database()
    sql="delete from client where numcompte=%s"
    val=(numcompte,)
    curseur.execute(sql,val)
    conn.commit()
    return "suppression reussie"

update("1001")
```

Test :

root@nasry-ahamadi:~/apicrud# python3 crud.py

```
root@nasry-ahamadi:~/apicrud# python3 crud.py
root@nasry-ahamadi:~/apicrud#
```

Vérification cote serveur MySQL :

mysql> select * from client;

```
mysql> select * from client;
+----+---------+-------+------+-----------+--------+
| id | prenom  | nom   | code | numcompte | solde  |
+----+---------+-------+------+-----------+--------+
|  1 | Ahamadi | Nasry | 1111 | 1001      | 500000 |
+----+---------+-------+------+-----------+--------+
1 row in set (0,00 sec)

mysql>
mysql> select * from client;
Empty set (0,00 sec)

mysql>
```

1.3.8 Création de l'api avec flask

1.3.8.1 Programme d'affichage.

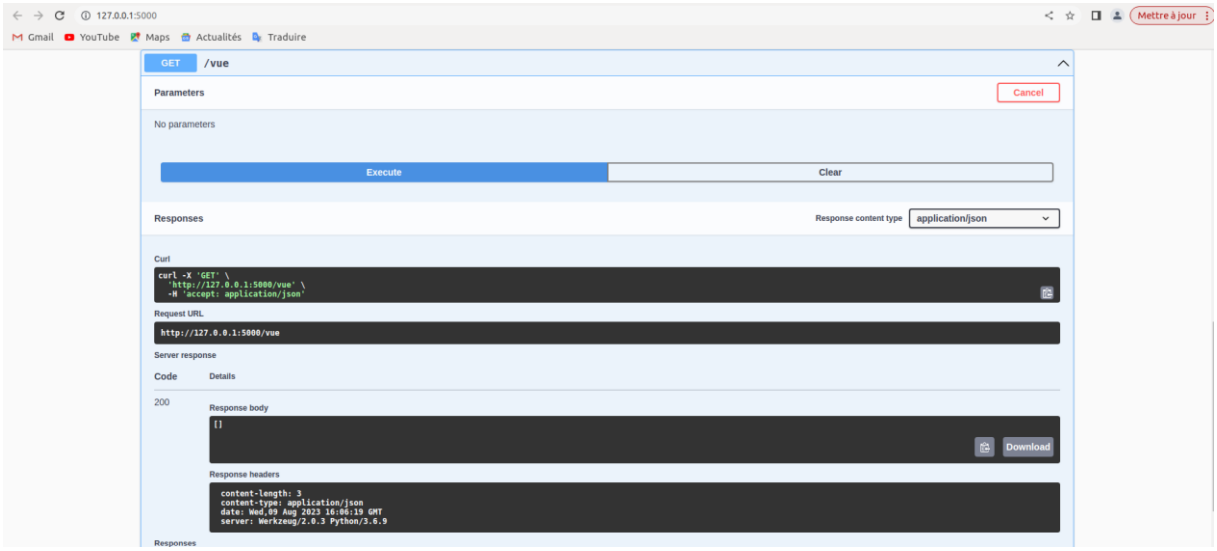
root@nasry-ahamadi:~/apicrud# vim crudapi.py

```
root@nasry-ahamadi:~/apicrud# vim crudapi.py
root@nasry-ahamadi:~/apicrud#
```

```
from flask import Flask, request, jsonify
from flask_restx import Api, Resource
import crud

app = Flask(__name__)
api = Api(app)

@api.route('/vue')
class voirnoir(Resource):
    def get(self):
        resultat = crud.lecture()
        return jsonify(resultat)

if __name__ == '__main__':
    app.run()
```

Test :

```
root@nasry-ahamadi:~/apicrud# python3 crudapi.py
 * Serving Flask app 'crudapi' (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: off
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
127.0.0.1 - - [09/Aug/2023 16:01:24] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:01:24] "GET /swaggerui/droid-sans.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:01:24] "GET /swaggerui/swagger-ui.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:01:24] "GET /swaggerui/swagger-ui-bundle.js HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:01:24] "GET /swaggerui/swagger-ui-standalone-preset.js HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:01:25] "GET /swagger.json HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:01:31] "GET /vue HTTP/1.1" 200 -
```



1.3.8.2 Programme d'insertion

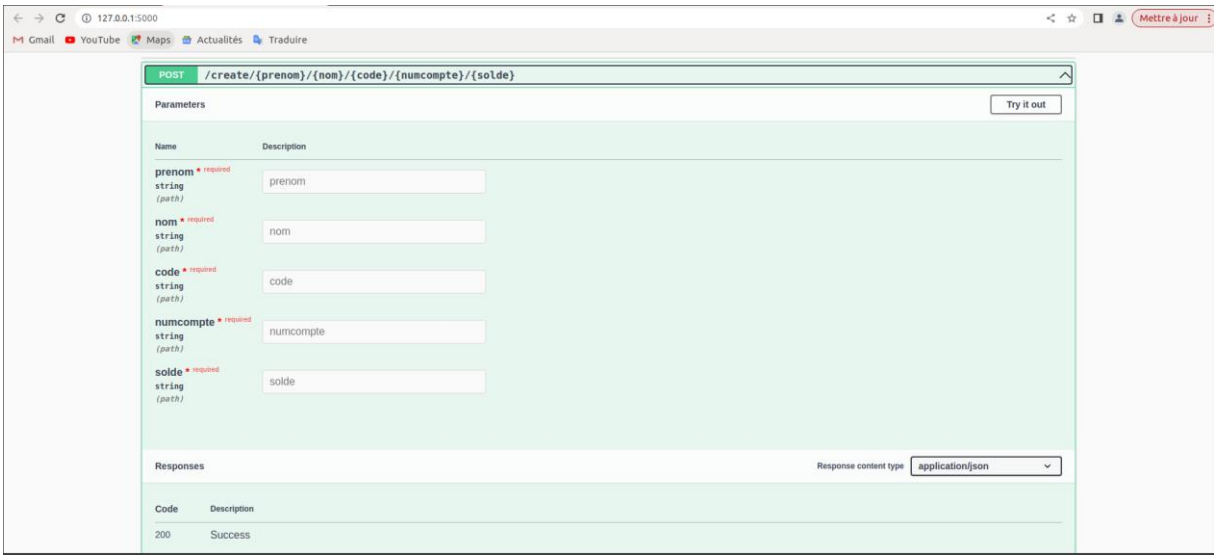
root@nasry-ahamadi:~/apicrud# vim crudapi.py

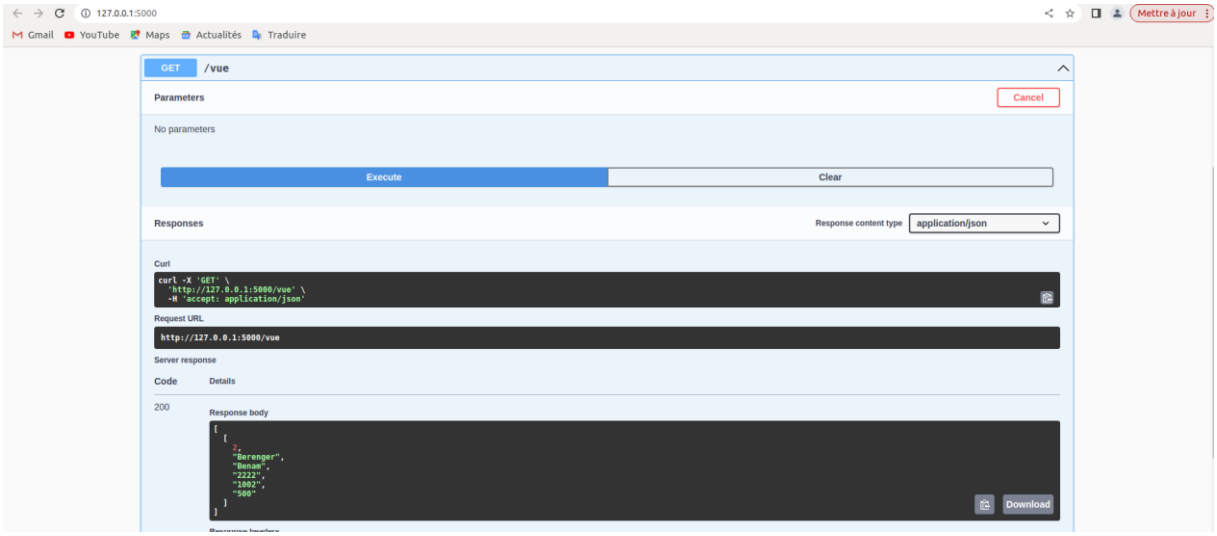
```
root@nasry-ahamadi:~/apicrud# vim crudapi.py
root@nasry-ahamadi:~/apicrud#
```

```python
@api.route('/create/<prenom>/<nom>/<code>/<numcompte>/<solde>')
class createnoir(Resource):
    def post(self, prenom, nom, code, numcompte, solde):
        crud.creation(prenom, nom, code, numcompte, solde)
        return jsonify({"message": "compte est creé avec success"})
```

Test :

```
root@nasry-ahamadi:~/apicrud# python3 crudapi.py
 * Serving Flask app 'crudapi' (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: off
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
127.0.0.1 - - [09/Aug/2023 16:05:19] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swaggerui/droid-sans.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swaggerui/swagger-ui.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swaggerui/swagger-ui-bundle.js HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swaggerui/swagger-ui-standalone-preset.js HTTP/1.1" 304 -
```





```
root@nasry-ahamadi:~/apicrud# python3 crudapi.py
 * Serving Flask app 'crudapi' (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: off
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
127.0.0.1 - - [09/Aug/2023 16:05:19] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swaggerui/droid-sans.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swaggerui/swagger-ui.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swaggerui/swagger-ui-bundle.js HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swaggerui/swagger-ui-standalone-preset.js HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swagger.json HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:05:20] "GET /swaggerui/favicon-32x32.png HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:06:19] "GET /vue HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:07:16] "GET /create/Berenger/Benam/2222/1002/500 HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:07:50] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:07:50] "GET /swaggerui/droid-sans.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:07:50] "GET /swaggerui/swagger-ui.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:07:50] "GET /swaggerui/swagger-ui-bundle.js HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:07:50] "GET /swaggerui/swagger-ui-standalone-preset.js HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:07:50] "GET /swagger.json HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:07:50] "GET /swaggerui/favicon-32x32.png HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:07:55] "GET /vue HTTP/1.1" 200 -
```

```
mysql> mysql> select * from client;
+----+----------+-------+------+-----------+-------+
| id | prenom   | nom   | code | numcompte | solde |
+----+----------+-------+------+-----------+-------+
|  2 | Berenger | Benam | 2222 | 1002      | 500   |
+----+----------+-------+------+-----------+-------+
1 row in set (0,00 sec)

mysql>
```

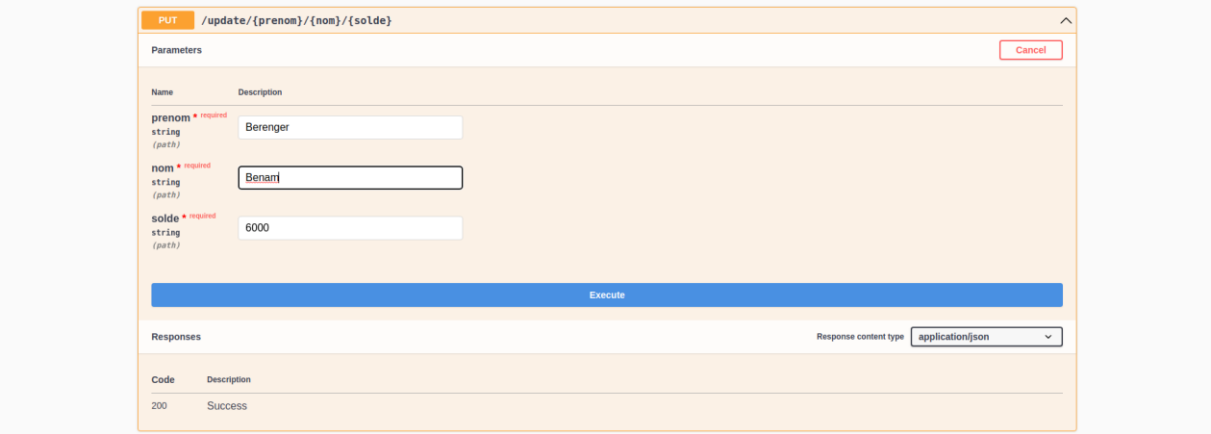
1.3.8.3 Programme de mise à jour

```python
@api.route('/update/<prenom>/<nom>/<solde>')
class updatenoir(Resource):
    def put(self, prenom,nom,solde):
        resultat = crud.update(prenom,nom,solde)
        if resultat:
            return jsonify({"message": f"le compte {prenom} est mise à jour avec success"})
        else:
            return jsonify({"message": f"le compte {prenom} n existe pas"})
```

Test :

root@nasry-ahamadi:~/apicrud# python3 crudapi.py

```
root@nasry-ahamadi:~/apicrud# python3 crudapi.py
 * Serving Flask app 'crudapi' (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: off
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```




```
root@nasry-ahamadi:~/apicrud# python3 crudapi.py
 * Serving Flask app 'crudapi' (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: off
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
127.0.0.1 - - [09/Aug/2023 16:21:09] "PUT /update/Berenger/Benam/6000 HTTP/1.1" 200 -
```

Avant modification :

mysql> select * from client;

```
mysql> mysql> select * from client;
+----+----------+-------+------+-----------+-------+
| id | prenom   | nom   | code | numcompte | solde |
+----+----------+-------+------+-----------+-------+
|  2 | Berenger | Benam | 2222 | 1002      | 500   |
+----+----------+-------+------+-----------+-------+
1 row in set (0,00 sec)

mysql>
```

Apres modification :

mysql> select * from client;

```
mysql> select * from client;
+----+----------+-------+------+-----------+-------+
| id | prenom   | nom   | code | numcompte | solde |
+----+----------+-------+------+-----------+-------+
|  2 | Berenger | Benam | 2222 | 1002      | 6000  |
+----+----------+-------+------+-----------+-------+
1 row in set (0,00 sec)

mysql>
```

1.3.8.4 Programme de suppression.

root@nasry-ahamadi:~/apicrud# vim crudapi.py

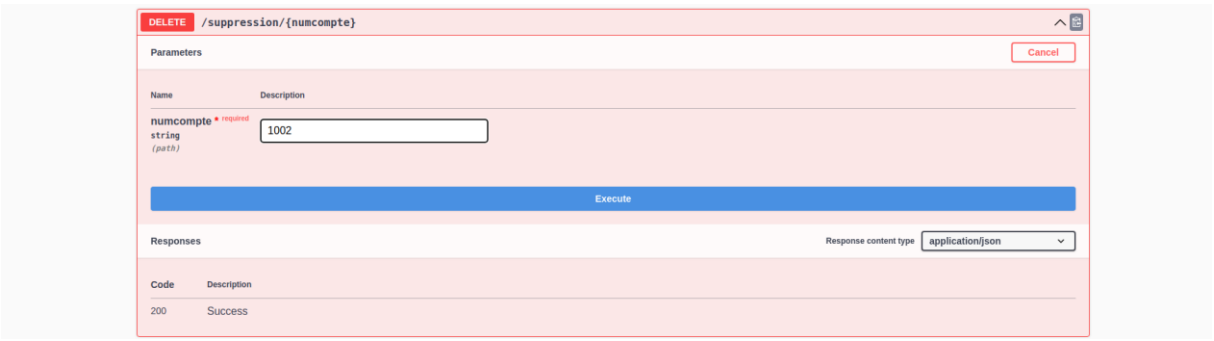
```
root@nasry-ahamadi:~/apicrud# vim crudapi.py
root@nasry-ahamadi:~/apicrud#
```

```
@api.route('/suppression/<numcompte>')
class deletenoir(Resource):
    def delete(self, numcompte):
        resultat = crud.delete(numcompte)
        if resultat:
            return jsonify({"message": f"le compte {numcompte} est supprimé avec success"})
        else:
            return jsonify({"message": f"le compte {numcompte} n existe pas"})
```

Test :

root@nasry-ahamadi:~/apicrud# python3 crudapi.py

```
root@nasry-ahamadi:~/apicrud# python3 crudapi.py
 * Serving Flask app 'crudapi' (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: off
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```




```
root@nasry-ahamadi:~/apicrud# python3 crudapi.py
 * Serving Flask app 'crudapi' (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: off
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
127.0.0.1 - - [09/Aug/2023 16:27:42] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:27:42] "GET /swaggerui/droid-sans.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:27:42] "GET /swaggerui/swagger-ui.css HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:27:42] "GET /swaggerui/swagger-ui-bundle.js HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:27:42] "GET /swaggerui/swagger-ui-standalone-preset.js HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:27:42] "GET /swagger.json HTTP/1.1" 200 -
127.0.0.1 - - [09/Aug/2023 16:27:42] "GET /swaggerui/favicon-32x32.png HTTP/1.1" 304 -
127.0.0.1 - - [09/Aug/2023 16:28:06] "DELETE /suppression/1002 HTTP/1.1" 200 -
```

Avant suppression :

mysql> select * from client;

```
mysql> select * from client;
+----+----------+-------+------+-----------+-------+
| id | prenom   | nom   | code | numcompte | solde |
+----+----------+-------+------+-----------+-------+
|  2 | Berenger | Benam | 2222 | 1002      | 6000  |
+----+----------+-------+------+-----------+-------+
1 row in set (0,00 sec)

mysql>
```

Apres suppression :

mysql> select * from client;

```
mysql> select * from client;
Empty set (0,00 sec)

mysql>
```

1.4 Hébergement d'Api(WSGI) avec Apache2

NB : Installation de paquet libapache2-mod-wsgi-py3 et il faut désinstaller la version libapache2-mod-wsgi souvent ça bloque Apache2 et le fichier virtuel donc c'est important de purger ce paquet pour installer la version libapache2-mod-wsgi-py3

root@nasry-ahamadi:~/ingenieur# apt install libapache2-mod-wsgi-py3

```
root@nasry-ahamadi:~/ingenieur# apt install libapache2-mod-wsgi-py3
Lecture des listes de paquets... Fait
Construction de l'arbre des dépendances
Lecture des informations d'état... Fait
libapache2-mod-wsgi-py3 est déjà la version la plus récente (4.5.17-1ubuntu1.1).
libapache2-mod-wsgi-py3 passé en « installé manuellement ».
Les paquets suivants ont été installés automatiquement et ne sont plus nécessaires :
  linux-hwe-5.4-headers-5.4.0-144 linux-hwe-5.4-headers-5.4.0-84
Veuillez utiliser « apt autoremove » pour les supprimer.
0 mis à jour, 0 nouvellement installés, 0 à enlever et 30 non mis à jour.
root@nasry-ahamadi:~/ingenieur#
```

On copie le projet dans /var/www/html :

root@nasry-ahamadi:~# cp -r apicrud/ /var/www/html/

```
root@nasry-ahamadi:~# cp -r apicrud/ /var/www/html/
root@nasry-ahamadi:~#
```

On crée le fichier __init__.py

root@nasry-ahamadi:~# cd /var/www/html/

root@nasry-ahamadi:/var/www/html# cd apicrud/

root@nasry-ahamadi:/var/www/html/apicrud# touch __init__.py

```
root@nasry-ahamadi:~# cd /var/www/html/
root@nasry-ahamadi:/var/www/html# cd apicrud/
root@nasry-ahamadi:/var/www/html/apicrud#
root@nasry-ahamadi:/var/www/html/apicrud# touch __init__.py
root@nasry-ahamadi:/var/www/html/apicrud#
```

On copie l'api dans __init__.py

root@nasry-ahamadi:/var/www/html/apicrud# cp crudapi.py __init__.py

```
root@nasry-ahamadi:/var/www/html/apicrud# cp crudapi.py __init__.py
root@nasry-ahamadi:/var/www/html/apicrud#
```

On donne les droit d'exécution.

root@nasry-ahamadi:/var/www/html/apicrud# chmod +x __init__.py

```
root@nasry-ahamadi:/var/www/html/apicrud# chmod +x __init__.py
root@nasry-ahamadi:/var/www/html/apicrud#
```

On va créer le fichier virtuel de notre site dans /etc/apache2/sites-available on créer le fichier api.conf :

root@nasry-ahamadi:/var/www/html/apicrud# nano /etc/apache2/sites-available/api.conf

```
root@nasry-ahamadi:/var/www/html/apicrud# nano /etc/apache2/sites-available/api.conf
root@nasry-ahamadi:/var/www/html/apicrud#
```

```
 GNU nano 2.9.3                                  /etc/apache2/sites-available/api.conf

<VirtualHost *:80>
        ServerName api.rtn.sn
        WSGIScriptAlias / /var/www/html/apicrud/crudapi.wsgi
</VirtualHost>
```

root@nasry-ahamadi:/var/www/html/apicrud# apachectl -t

```
root@nasry-ahamadi:/var/www/html/apicrud# apachectl -t
AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' directive globally to supp
ress this message
Syntax OK
root@nasry-ahamadi:/var/www/html/apicrud#
```

On sauvegarde puis on active le site virtuel et démarrer apache2.

root@nasry-ahamadi:/var/www/html/apicrud# a2ensite api.conf

root@nasry-ahamadi:/var/www/html/apicrud# systemctl reload apache2

```
root@nasry-ahamadi:/var/www/html/apicrud# a2ensite api.conf
Enabling site api.
To activate the new configuration, you need to run:
  systemctl reload apache2
root@nasry-ahamadi:/var/www/html/apicrud# systemctl reload apache2
root@nasry-ahamadi:/var/www/html/apicrud#
```

Création du script wsgi, on va créer le fichier crudapi.wsgi dans /var/www/html/API et voici son contenu

root@nasry-ahamadi:/var/www/html/apicrud# nano crudapi.wsgi

```
root@nasry-ahamadi:/var/www/html/apicrud# nano crudapi.wsgi
root@nasry-ahamadi:/var/www/html/apicrud#
```

```
 GNU nano 2.9.3                                          crudapi.wsgi

import sys
sys.path.append('/var/www/html/apicrud')
sys.stdout=sys.stderr
from crudapi import app as application
```

root@nasry-ahamadi:/var/www/html/apicrud# chmod +x crudapi.wsgi

```
root@nasry-ahamadi:/var/www/html/apicrud# chmod +x crudapi.wsgi
root@nasry-ahamadi:/var/www/html/apicrud#
```

Vue que on n'a pas le nom de domaine on va dans /etc/hosts pour faire la correspondance qu'on a défini tout à l'heure dans notre fichier virtuel qui se trouve dans /etc/apache2/sites-available

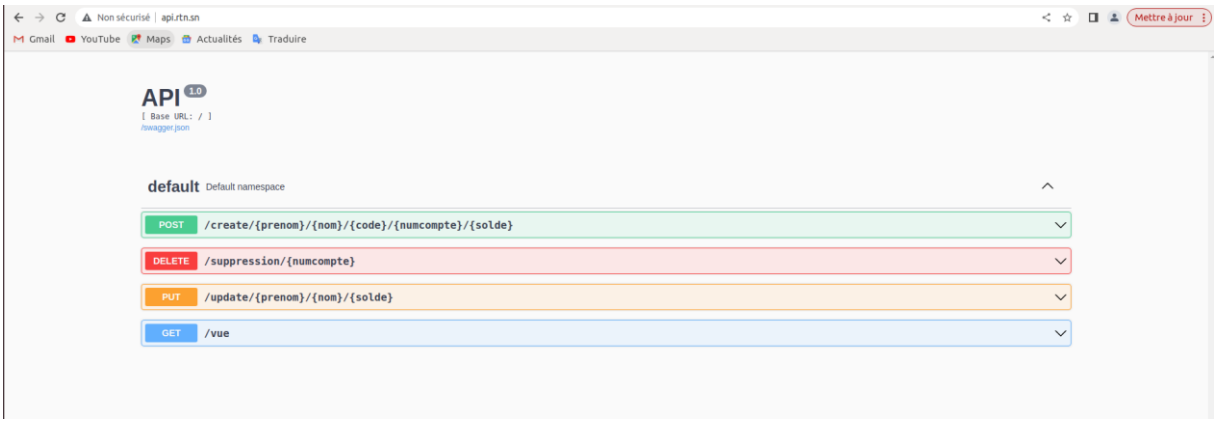
root@nasry-ahamadi:/var/www/html/apicrud# nano /etc/hosts

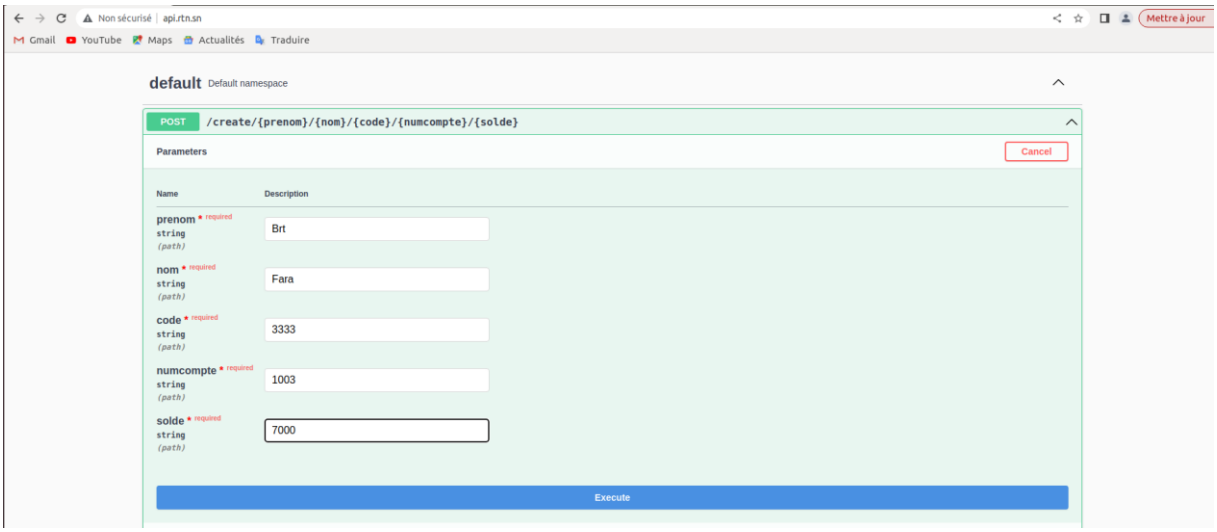
```
root@nasry-ahamadi:/var/www/html/apicrud# nano /etc/hosts
root@nasry-ahamadi:/var/www/html/apicrud#
```

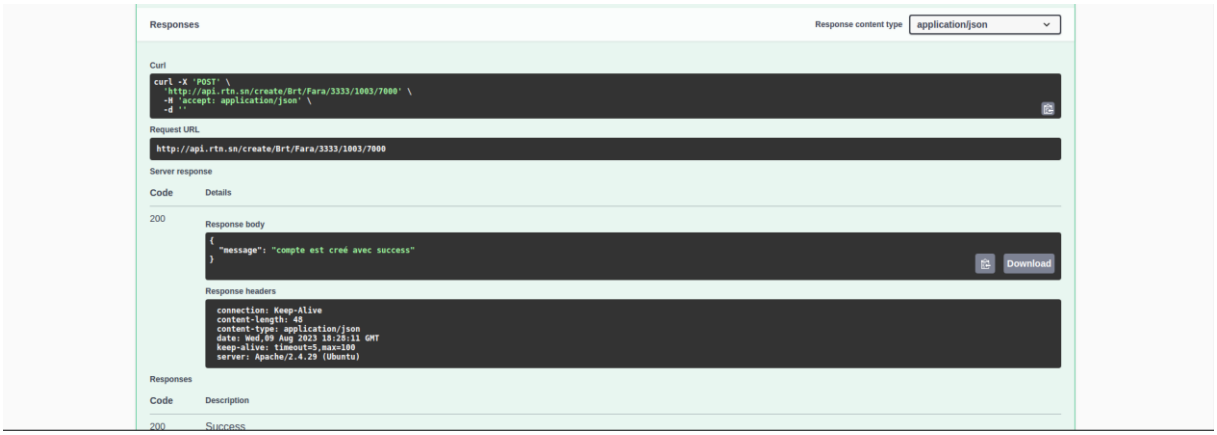
```
  GNU nano 2.9.3                                                /etc/hosts

127.0.0.1       localhost api.rtn.sn
127.0.1.1       nasry-ahamadi

# The following lines are desirable for IPv6 capable hosts
::1     ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

Test coté navigateur :

http://api.rtn.sn/







Vérification cote serveur MySQL :

mysql> select * from client;

```
mysql> select * from client;
+----+--------+------+------+-----------+-------+
| id | prenom | nom  | code | numcompte | solde |
+----+--------+------+------+-----------+-------+
|  3 | Brt    | Fara | 3333 | 1003      | 7000  |
+----+--------+------+------+-----------+-------+
1 row in set (0,00 sec)

mysql>
```

1.5 Partie interface de consommation (frontend) :

La partie interface de consommation (frontend) d'une API joue un rôle essentiel dans l'expérience globale de l'utilisateur lorsqu'il interagit avec l'API. Cette interface, généralement une application web, agit comme un pont entre l'utilisateur et les fonctionnalités offertes par l'API.

L'objectif principal de la partie frontend d'une API est de fournir aux utilisateurs une manière accueillante et facile à appréhender d'interagir avec les données et les services exposés par l'API. Voici quelques points clés à considérer dans cette explication :

1.5.1 Mise en œuvre

root@nasry-ahamadi:/var/www/html# mkdir frontendapi

root@nasry-ahamadi:/var/www/html# cd frontendapi/

```
root@nasry-ahamadi:/var/www/html# mkdir frontendapi
root@nasry-ahamadi:/var/www/html# cd frontendapi/
root@nasry-ahamadi:/var/www/html/frontendapi#
```

1.5.1.1 Programme d'insertion

Voici notre code html bootstrap :

root@nasry-ahamadi:/var/www/html/frontendapi# nano insertion.html

```
root@nasry-ahamadi:/var/www/html/frontendapi# nano insertion.html
root@nasry-ahamadi:/var/www/html/frontendapi#
```

```
 GNU nano 2.9.3                                                    insertion.html

<html>
<head>
<title>ajout</title>
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.3/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-rbsA2VBKQhggwzxH7pPCaAq
<head>
<body>
<div class="offset-5 my-4 col-3">
    <h1 class="text-center">Ajout</h1>
    <form method="POST" action="insert1.php">
    <div class="mb-3 row">
    <label for="Prenom" class="col-sm-3">Prenom</label>
    <div class="col-sm-8">
     <input type="text" class="form-control" placeholder="Prenom" name="prenom">
    </div>
  </div>
   <div class="mb-3 row">
    <label for="nom" class="col-sm-3">Nom</label>
    <div class="col-sm-8">
     <input type="text" class="form-control" id="nom" placeholder="nom" name="nom">
    </div>
  </div>
  <div class="mb-3 row">
    <label for="code" class="col-sm-3">Code</label>
    <div class="col-sm-8">
      <input type="text" class="form-control" id="code" placeholder="code" name="code">
    </div>
  </div>
    <div class="mb-3 row">
    <label for="numcompte" class="col-sm-3">Numcompte</label>
    <div class="col-sm-8">
      <input type="text" class="form-control" id="numcompte" placeholder="numero compte" name="numcompte">
    </div>
  </div>
   <div class="mb-3 row">
    <label for="solde" class="col-sm-3">Solde</label>
    <div class="col-sm-8">
      <input type="text" class="form-control" id="solde" placeholder="solde" name="solde">
    </div>
  </div>
  <div class="offset-5">
    <button class="btn btn-success" type="submit">Valider</button>
  </div>
  </form>
</body>
```

Voici notre programme PHP qui permet de faire une insertion dans la base de données :

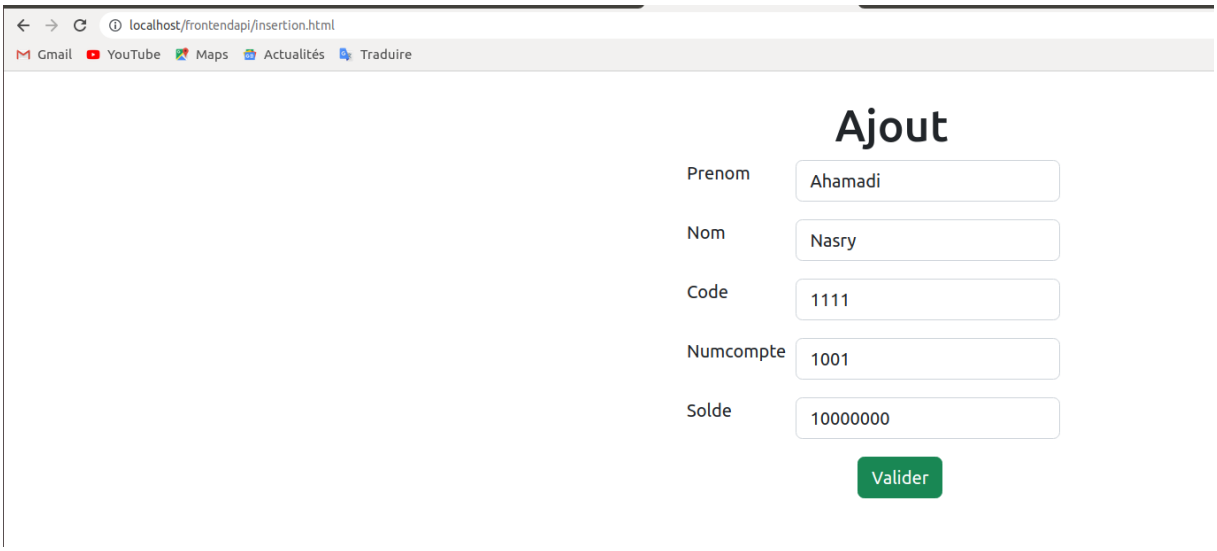
root@nasry-ahamadi:/var/www/html/frontendapi# nano insert1.php

```
root@nasry-ahamadi:/var/www/html/frontendapi# nano insert1.php
root@nasry-ahamadi:/var/www/html/frontendapi#
```

```
 GNU nano 2.9.3                                                  insert1.php

<?php
if ($_SERVER["REQUEST_METHOD"] == "POST") {
    $prenom = $_POST["prenom"];
    $nom = $_POST["nom"];
    $code = $_POST["code"];
    $numcompte = $_POST["numcompte"];
    $solde = $_POST["solde"];

    $ch = curl_init();

    $url = "http://api.rtn.sn/create/$prenom/$nom/$code/$numcompte/$solde";

    curl_setopt($ch, CURLOPT_URL, $url);
    curl_setopt($ch, CURLOPT_RETURNTRANSFER, 1);
    curl_setopt($ch, CURLOPT_POST, 1);

    $headers = array();
    $headers[] = 'Accept: application/json';
    $headers[] = 'Content-Type: application/x-www-form-urlencoded';
    curl_setopt($ch, CURLOPT_HTTPHEADER, $headers);

    $result = curl_exec($ch);
    if (curl_errno($ch)) {
        echo 'Error:' . curl_error($ch);
    }
    curl_close($ch);
}
?>
```

Test

http://localhost/frontendapi/insertion.html



Vérification cote serveur MySQL

mysql> select * from client;

```
mysql> select * from client;
+----+---------+-------+------+-----------+----------+
| id | prenom  | nom   | code | numcompte | solde    |
+----+---------+-------+------+-----------+----------+
|  1 | Ahamadi | Nasry | 1111 | 1001      | 10000000 |
+----+---------+-------+------+-----------+----------+
1 row in set (0,00 sec)

mysql>
```

1.5.1.2 Programme d'affichage

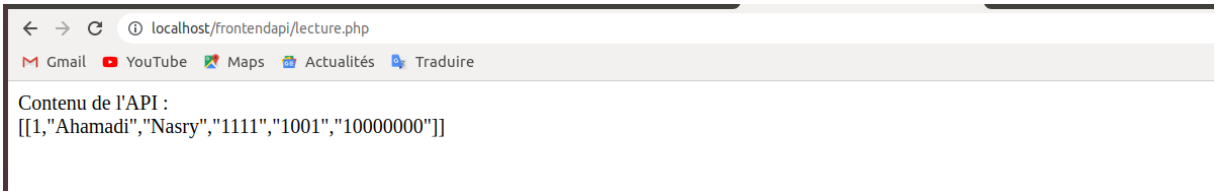
Voici notre programme PHP qui permet d'afficher les données qui existent dans la base de données :

root@nasry-ahamadi:/var/www/html/frontendapi# nano lecture.php

```
root@nasry-ahamadi:/var/www/html/frontendapi# nano lecture.php
root@nasry-ahamadi:/var/www/html/frontendapi#
```

```
  GNU nano 2.9.3                                              lecture.php

<?php
$ch = curl_init();

curl_setopt($ch, CURLOPT_URL, 'http://api.rtn.sn/vue');
curl_setopt($ch, CURLOPT_RETURNTRANSFER, 1);
curl_setopt($ch, CURLOPT_CUSTOMREQUEST, 'GET');

$headers = array();
$headers[] = 'Accept: application/json';
curl_setopt($ch, CURLOPT_HTTPHEADER, $headers);

$result = curl_exec($ch);
if (curl_errno($ch)) {
    echo 'Error:' . curl_error($ch);
}
curl_close($ch);

// Afficher le contenu de l'API
echo "Contenu de l'API :<br>";
echo $result;
?>
```

Test :



1.5.1.3 Programme de mise à jour

Voici notre code html bootstrap :

root@nasry-ahamadi:/var/www/html/frontendapi# nano update.html

```
root@nasry-ahamadi:/var/www/html/frontendapi# nano update.html
root@nasry-ahamadi:/var/www/html/frontendapi#
```

```
 GNU nano 2.9.3                                                    update.html

<html>
<head>
<title>ajout</title>
    <meta charset="utf-8">
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.3/dist/css/bootstrap.min.css" rel="stylesheet" integrity=
<head>
<body>
<div class="offset-5 my-4 col-3">
    <h1 class="text-center">Mise à jour</h1>
    <form method="POST" action="update.php">
    <div class="mb-3 row">
    <label for="Prenom" class="col-sm-3">Prenom</label>
    <div class="col-sm-8">
     <input type="text" class="form-control" placeholder="Prenom" name="prenom">
    </div>
  </div>
   <div class="mb-3 row">
    <label for="nom" class="col-sm-3">Nom</label>
    <div class="col-sm-8">
     <input type="text" class="form-control" id="nom" placeholder="nom" name="nom">
    </div>
  </div>
   <div class="mb-3 row">
    <label for="solde" class="col-sm-3">Solde</label>
    <div class="col-sm-8">
      <input type="text" class="form-control" id="solde" placeholder="solde" name="solde">
    </div>
  </div>
  <div class="offset-5">
    <button class="btn btn-warning" type="submit">Valider</button>
  </div>
  </form>
</body>
```

Voici notre programme PHP :

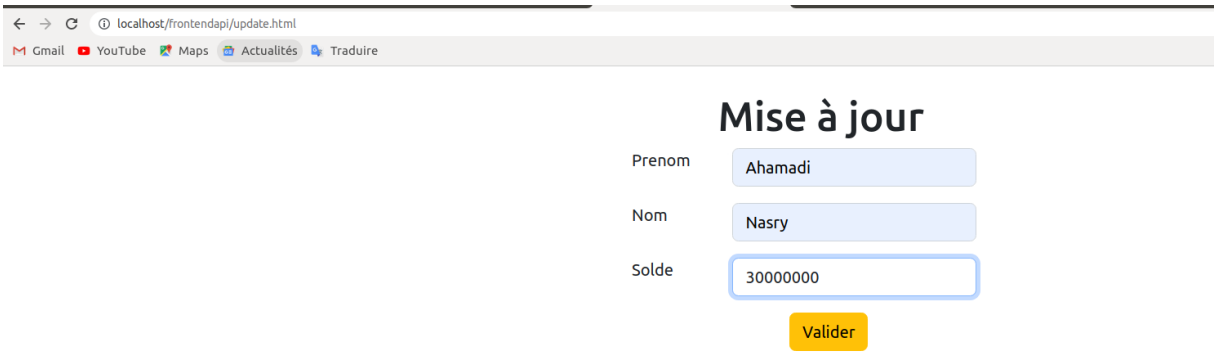
root@nasry-ahamadi:/var/www/html/frontendapi# nano update.php

```
root@nasry-ahamadi:/var/www/html/frontendapi# nano update.php
root@nasry-ahamadi:/var/www/html/frontendapi#
```

```
 GNU nano 2.9.3

<?php
if ($_SERVER["REQUEST_METHOD"] == "POST") {
    $prenom = $_POST["prenom"];
    $nom = $_POST["nom"];
    $nouveausolde = $_POST["solde"];

    $ch = curl_init();

    $url = "http://api.rtn.sn/update/$prenom/$nom/$nouveausolde";

    curl_setopt($ch, CURLOPT_URL, $url);
    curl_setopt($ch, CURLOPT_RETURNTRANSFER, 1);
    curl_setopt($ch, CURLOPT_CUSTOMREQUEST, 'PUT');

    $headers = array(
        'Accept: application/json'
    );
    curl_setopt($ch, CURLOPT_HTTPHEADER, $headers);

    $result = curl_exec($ch);
    if (curl_errno($ch)) {
        echo 'Error:' . curl_error($ch);
    }
    curl_close($ch);
}
?>
```

Test :

http://localhost/frontendapi/update.html



Avant modification :

mysql> select * from client;

```
mysql> select * from client;
+----+---------+-------+------+-----------+----------+
| id | prenom  | nom   | code | numcompte | solde    |
+----+---------+-------+------+-----------+----------+
|  1 | Ahamadi | Nasry | 1111 | 1001      | 10000000 |
|  2 | Ismaela | Fall  | 2222 | 1002      | 200000   |
+----+---------+-------+------+-----------+----------+
2 rows in set (0,00 sec)

mysql>
```

Apres modification :

mysql> select * from client;

```
mysql> select * from client;
+----+---------+-------+------+-----------+----------+
| id | prenom  | nom   | code | numcompte | solde    |
+----+---------+-------+------+-----------+----------+
|  1 | Ahamadi | Nasry | 1111 | 1001      | 30000000 |
|  2 | Ismaela | Fall  | 2222 | 1002      | 300000   |
+----+---------+-------+------+-----------+----------+
2 rows in set (0,00 sec)

mysql>
```

1.5.1.4 Programme de suppression

Voici notre code html bootstrap :

root@nasry-ahamadi:/var/www/html/frontendapi# nano suppression.html

```
root@nasry-ahamadi:/var/www/html/frontendapi# nano suppression.html
root@nasry-ahamadi:/var/www/html/frontendapi#
```

```
 GNU nano 2.9.3                                              suppression.html

<html>
<head>
<title>suppression</title>
    <meta charset="utf-8">
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.3/dist/css/bootstrap.min.css" rel="sty
<head>
<body>
<div class="offset-5 my-4 col-3">
    <h1 class="text-center">Suppression</h1>
    <form method="POST" action="suppression.php">
    <div class="mb-3 row">
    <label for="numcompte" class="col-sm-3">Numcompte</label>
    <div class="col-sm-8">
     <input type="text" class="form-control" placeholder="numcompte" name="numcompte">
    </div>
  </div>
  <div class="offset-5">
    <button class="btn btn-danger" type="submit">Supprimer</button>
  </div>
  </form>
</body>
```

Voici notre programme PHP qui permet de supprimer :

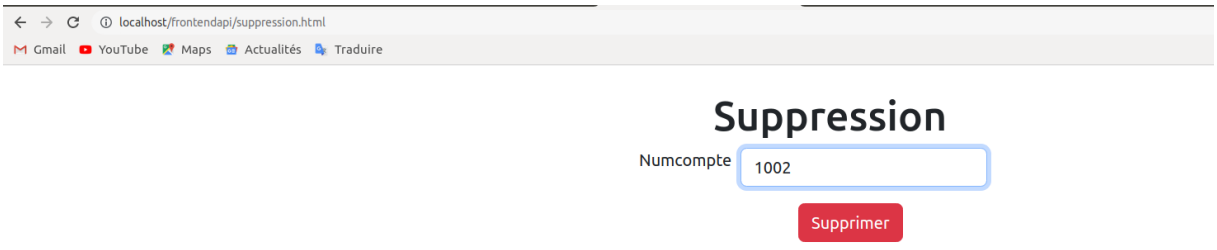
root@nasry-ahamadi:/var/www/html/frontendapi# nano suppression.php

```
root@nasry-ahamadi:/var/www/html/frontendapi# nano suppression.php
root@nasry-ahamadi:/var/www/html/frontendapi#
```

```
  GNU nano 2.9.3                                          suppression.php

<?php
if ($_SERVER["REQUEST_METHOD"] == "POST") {
    $numcompte = $_POST["numcompte"];

    $ch = curl_init();

    $url = "http://api.rtn.sn/suppression/$numcompte";

    curl_setopt($ch, CURLOPT_URL, $url);
    curl_setopt($ch, CURLOPT_RETURNTRANSFER, 1);
    curl_setopt($ch, CURLOPT_CUSTOMREQUEST, 'DELETE');

    $headers = array(
        'Accept: application/json'
    );
    curl_setopt($ch, CURLOPT_HTTPHEADER, $headers);

    $result = curl_exec($ch);
    if (curl_errno($ch)) {
        echo 'Error:' . curl_error($ch);
    }
    curl_close($ch);
}
?>
```

Test :

http://localhost/frontendapi/suppression.html



Avant suppression :

mysql> select * from client;

```
mysql> select * from client;
+----+---------+-------+------+-----------+----------+
| id | prenom  | nom   | code | numcompte | solde    |
+----+---------+-------+------+-----------+----------+
|  1 | Ahamadi | Nasry | 1111 | 1001      | 30000000 |
|  2 | Ismaela | Fall  | 2222 | 1002      | 300000   |
+----+---------+-------+------+-----------+----------+
2 rows in set (0,00 sec)

mysql>
```

Apres suppression :

mysql> select * from client;

```
mysql> select * from client;
+----+---------+-------+------+-----------+----------+
| id | prenom  | nom   | code | numcompte | solde    |
+----+---------+-------+------+-----------+----------+
|  1 | Ahamadi | Nasry | 1111 | 1001      | 30000000 |
+----+---------+-------+------+-----------+----------+
1 row in set (0,00 sec)

mysql>
```