

Chatbot & Recommender Systems

Final Project

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Introduction:

For this project, we chose to work on a theme common to all three of us: music.

We looked for interesting APIs available on the internet to model the most interesting chatbot in its information. We obviously came across **Spotify** for web developers API and used it as a starting point for our project.

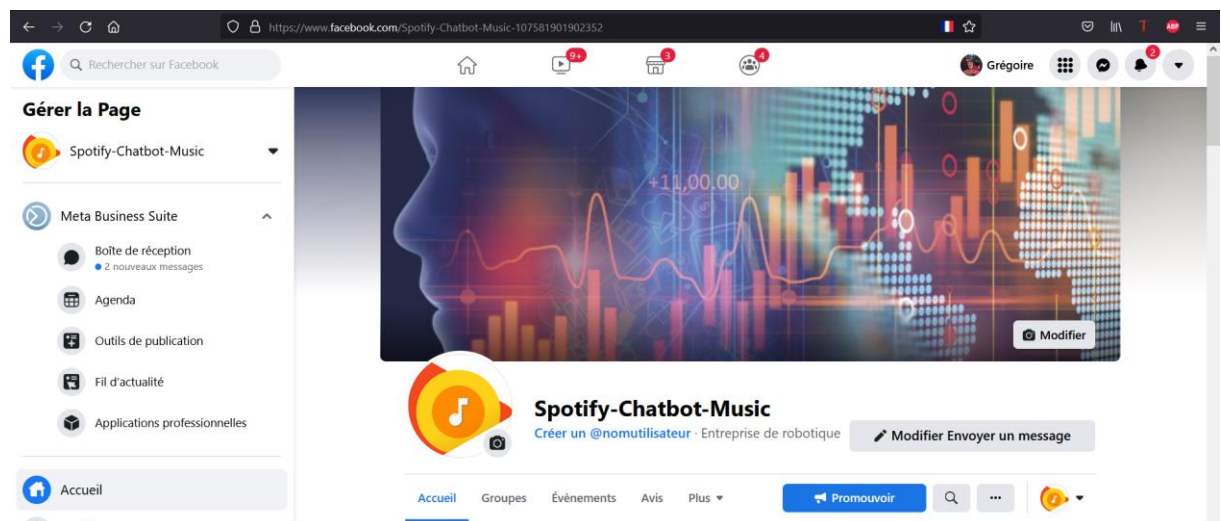
Finally, our project can be sum up as follows:

- A messenger chatbot built with **Meta for developers** (ex-Facebook for developers).
- A **Spotify API** with generated keys to use the Node.js web-spotify-api module.
- A local **Node.js** backend project
- A **ngrok webhook** linking the page to the backend via a secure url.
- The **recommendation system** linked to the Spotify API with ngrok.

Chatbot URL : <https://www.facebook.com/Spotify-Chatbot-Music-107581901902352/>

Linked to our Github Repository: <https://github.com/Gregdur/Chatbot-RecommenderSystems-Final-Project>

Facebook Page:



The chatbot's name is **Spotify-chatbot-music**. It is a classic **Messenger** chatbot that every Messenger user can have access to.

The goal is to create a chatbot that can give suggestions of music, playlist, artists or more depending on the listening historic and other data we can have access. For this reason, we need a way to access relevant data about the person using the chatbot to have an effective chatbot.

As said before, **Spotify** is a great and the most used worldwide streaming platform, using that application can be a good data provider for our recommendation system so we decided to use it. In order to be able to use our chatbot, the account must be linked to a Spotify profile.

Facebook for developers:


Tokens d'accès

Créer une Page

Générez un token d'accès de Page pour commencer à utiliser les API de plateforme. Vous pourrez générer un token d'accès pour une Page si :

1. Vous êtes un des administrateurs de la Page et
2. L'app dispose d'une autorisation de type gérer et accéder aux conversations de la Page dans Messenger pour cette Page.

Note : si votre app est en mode dev, vous pouvez toujours générer un token mais vous ne pourrez accéder qu'aux personnes qui gèrent l'app ou la Page.

Pages ↑	Tokens
 Spotify-Chatbot-Music 107581901902352	— <div>Générer un token</div>

Ajouter ou supprimer des Pages ⓘ

Webhooks

Pour recevoir des messages et d'autres événements envoyés par les utilisateurs de Messenger, l'app doit activer l'intégration webhooks.

URL de rappel

Vérifier le jeton

https://2048-176-159-57-62.ngrok.io/

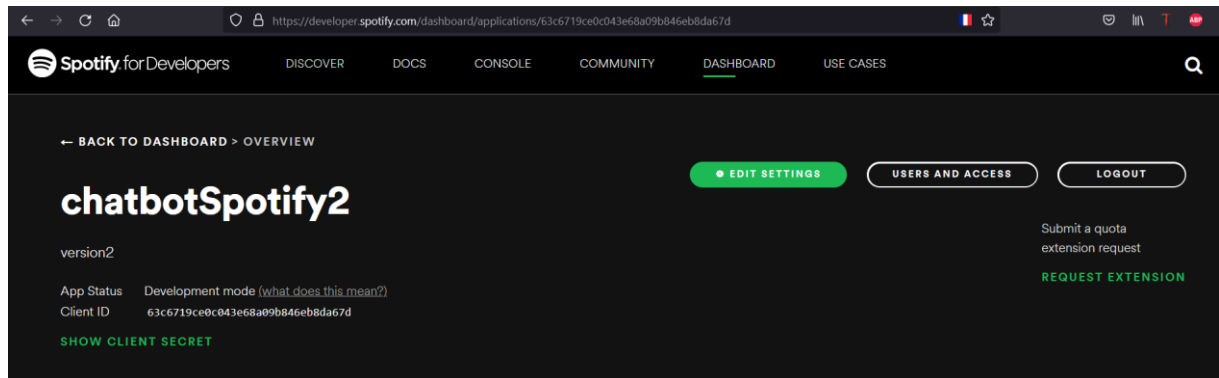
.....

Les demandes de validation et les notifications de Webhook pour cet objet seront envoyées à cette URL.

Token que vous renverra Meta dans le cadre de la vérification de l'URL de rappel.

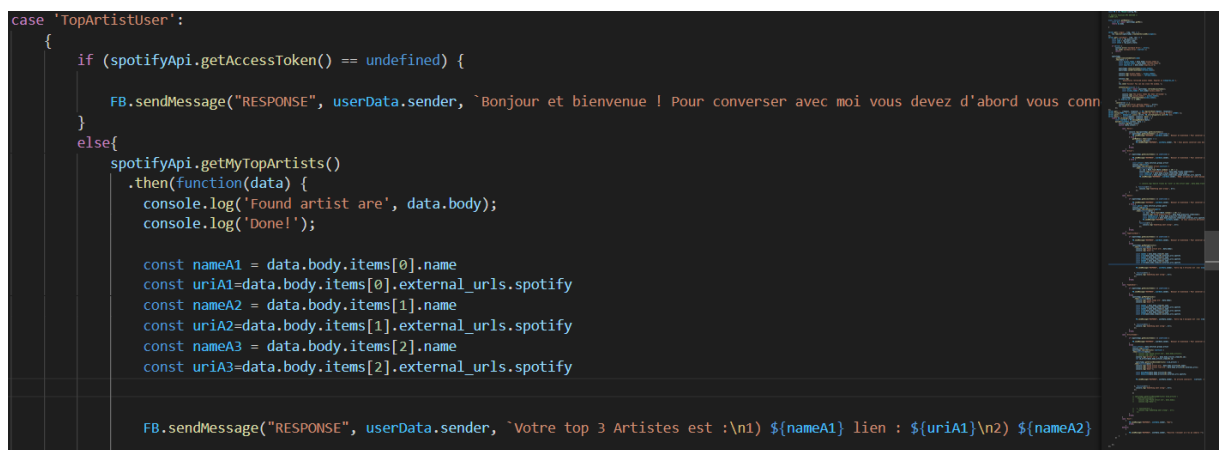
We have to load the chatbot created page to generate tokens in order to make it usable.

Spotify for Developers:



Thanks to this, we could have an access to Spotify APIs for needed functionalities.

Node.js Backend:



The rule-based chatbot implementation is made thanks to Node.js back end.

Webhook ngrok:

```
Invite de commandes - ngrok http 3000
ngrok by @inconshreveable (Ctrl+C to quit)

Session Status      online
Account             Grégoire Caurier (Plan: Free)
Version             2.3.40
Region              United States (us)
Web Interface       http://127.0.0.1:4040
Forwarding           http://2048-176-159-57-62.ngrok.io -> http://localhost:3000
                    https://2048-176-159-57-62.ngrok.io -> http://localhost:3000

Connections        ttl    opn    rt1    rt5    p50    p90
                  17     0      0.00   0.00   5.04   5.41

HTTP Requests
-----
POST /              200 OK
POST /              200 OK
POST /              200 OK
POST /              200 OK
POST /              200 OK
POST /              200 OK
POST /              200 OK
POST /              200 OK
POST /              200 OK
GET /favicon.ico    404 Not Found
GET /callback       200 OK
```

This allow us to link all together what we have done.

Summary :

As you can guess, we created a “Meta for developers” project named **Spotify-music-chatbot**. We also created “Spotify for developer” accounts to be able to use the API of that platform to be able to use it and let our recommendation system use the songs on that platform.

With Node.js, we coded the connection between **Spotify API** and the **Messenger** chatbot using **Webhooks**. The webhooks were done thanks to the Webhook **ngrok** library.

Recommendation system:

In order to build our recommender system, we used some csv files that we obtained from our **Spotify** account after a demand of download access in the confidentialities settings.

We used 2 mains datasets :

- **Listening history**
- **Song features**

We first pre-processed and cleaned the dataset. After that, we tried to point at relevant features that we can base on our system recommender criteria. For this, we used a **correlation matrix**.

After that, we finally applied different models on our data split in training and testing sets that are:


- **Random Forest**
- **Decision Tree**
- **Logistic Regression**

We used also **cross-validation** and **hyperparameters** methods to improve our model accuracy measured by a **F1 score**.


We managed to have a model with a ~99% accuracy with the Random Forest model.

Scenarios of chats with the bot:


Get a song from an artist:







Hmmm, je pense que cette musique : Enna Boost de plk pourrait vous plaire
Voici le lien (cliquez pour écouter): <https://open.spotify.com/album/2iNbsl9qbLPDqll4MNkowx>

 musique de plk


Get my top 3 of favourite artists:




Votre top 3 Artistes est :
1) Lofi Fruits Music lien : <https://open.spotify.com/artist/1dABGukgZ8XKKOdd2rVSHM>
2) Hans Zimmer lien : <https://open.spotify.com/artist/0YC192cP3KPCRWx8zr8MfZ>
3) Queen lien : <https://open.spotify.com/artist/1dfeR4HaWDbWqFHLkxsg1d>

    montre moi mes artistes préférés

Get my top 3 of favourite songs:



Votre top 3 musiques est :
1) Do Ya Think I'm Sexy lien : <https://open.spotify.com/track/3wsPg2KrRYZF0i0nlfFa41x>
2) Je voudrais lien : <https://open.spotify.com/track/1H4mV921qT4S5hek4zxKp5>
3) Wildest Dreams lien : <https://open.spotify.com/track/2fuiA0FOANMrcr2jXMc0nP>

 montre moi mes sons préférés

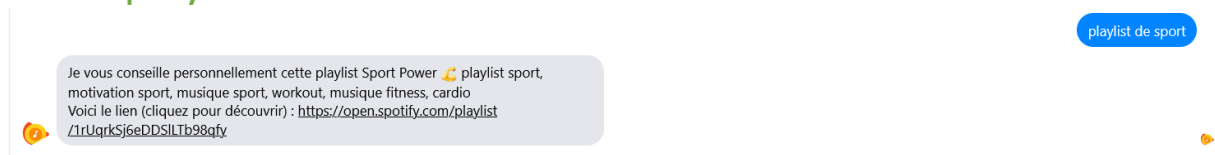
Get an artist like a one I listen to:



Un artiste similaire à adele :
Jessie J lien : <https://open.spotify.com/artist/2gsggkzM5R49q6jpPvazou>

 artiste comme adele

Get a playlist based on a theme I liked:



Here are the different functionalities we implemented in our chatbot. To be able to interact with it, the specific sentences should be said as said in the images.