Universidad Internacional de Valencia

Bases de Datos Web

Actividad 2

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1. Introducción

La plataforma en la que consta la presente actividad, se centra en ofrecer un espacio donde los usuarios pueden buscar diversas canciones, álbumes y artistas. La aplicación facilita la búsqueda de música, permitiendo a los usuarios descubrir nuevas canciones y disfrutar de una experiencia de reproducción intuitiva.

Mediante un enfoque amigable para presupuestos limitados, la plataforma de música se esfuerza por ser una solución básica pero efectiva para aquellos que desean explorar y organizar su biblioteca musical de manera sencilla.

No se trata de una tienda de música, sino más bien, de una herramienta que permite a los usuarios acceder y disfrutar de su música preferida de manera fácil y directa.

La aplicación se distingue por su simplicidad y funcionalidad, proporcionando una experiencia musical agradable y sin complicaciones.

2. Obtención de los datos

Los datos utilizados para esta actividad, se obtuvieron mediante la api de: https://rapidapi.com/deezerdevs/api/deezer-1/ donde se encuentra una gran variedad de datos y de ficheros musicales. En esta api, podemos obtener información de la canciones, artistas y álbumes que, a demás, son los datos que necesitamos para crear nuestra estructura en MongoDB.

A continuación mostramos la colecciones junto con los atributos o campos que aparecen en nuestra base de datos y una breve descripción de ellos:

SONGS

Una canción es una composición musical que posee una melodía, ritmo, letra, así como el acompañamiento de instrumentos musicales, para que pueda ser interpretada por uno o varios

vocalistas.

- _Id: es el identificador de la pista(integer)
- album: el album a cual pertenece (string)
- track: el numero de la pista en el album (integer)
- name:nombre de la pista(string)
- duration: tiempo de duracion de la pista(string)
- file:ubicacion del archivo de la pista (string)
- created_at: fecha de creacion del registro(date)

ALBUMS

Colección de grabaciones de sonido, incluyendo el CD, minidisco y casete. Incluso a un conjunto de canciones puestas a la venta al mismo tiempo para su distribución en línea en un sitio de descarga de música, se le menciona a veces como un álbum.

- _id: es el identificador del album(integer)
- artist: el artista del album (string)
- title: titulo del album(string)
- description: breve descripcion del album(string)
- year: año de lanxamiento(integer)
- image: imagen del album(string)
- created_at:fecha de creacion del registro(date)

ARTIST

Un cantante o cantor es un artista que produce con su voz melodías, normalmente utilizando palabras que suelen rimar.

- _id: es el identificador del artista(integer)
- name: es el nombre del artista(string)
- description: una breve descripcion del artista(string)
- image: imagen del artista(string)
- created_at:fecha de creacion del registro(date)

USERS

Se entiende por usuario a aquella persona que emplea un producto o servicio, bien de forma ocasional, bien de forma habitual; lo normal es referirse a estos individuos cuando la utilización se realiza con frecuencia, aunque no sea imprescindible que esto ocurra.

- _id: es el identificador del usuario(integer)
- name: nombre del usuario(string)

- surname: apellido del usuario(string)
- nick: nombre de usuario(string)
- email: correo electronico del usuario(string)
- password: conatraseña del usuario(string)
- role: perfil del usuario(string)
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    "track": 1,
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  "created_at": "2004-01-01"
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    "duration": 310,
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    "name": "For U (Album Version Explicit)",
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    "track": 1,
    "name": "Fast Lane (Remix)",
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    "track": 1,
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    "album": 2307131,
    "track": 1,
    "name": "Wait A Minute",
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    "id": 24151531,
    "album": 2307131,
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    "id": 24151561,
    "album": 2307131,
    "track": 1,
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    "id": 24151571,
    "album": 2307131,
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    "id": 24151591,
    "album": 2307131,
    "track": 1,
    "name": "How Many Times, How Many Lies",
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    "album": 2307131,
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  "id": 24151641,
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  "name": "Wake Up (Album Version Explicit)",
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  "id": 1574039,
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  "name": "Violent (Album Version Explicit)",
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    "track": 1,
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    "album": 161381,
    "track": 1,
    "name": "Mama (Album Version Explicit)",
    "duration": 249,
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    "id": 1574070,
    "album": 161381,
    "track": 1,
    "name": "24's (Album Version Explicit)",
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  {
    "id": 1574073,
    "album": 161381,
    "track": 1,
    "name": "Everywhere I Go (Album Version Explicit)",
    "duration": 221,
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    "created_at": "2006-08-12"
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    "album": 161381,
    "track": 1,
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  "name": "Misha Best",
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  "name": "Predatory Void",
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  "name": "t.A.T.u.",
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  "created_at": "2006-01-01"
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  "name": "M83",
  "descripcion": "M83",
  "image": "https://api.deezer.com/artist/678/image",
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  "id": 983,
  "name": "Patti LaBelle",
  "descripcion": "Patti LaBelle",
  "image": "https://api.deezer.com/artist/983/image",
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  "id": 138,
  "name": "Ja Rule",
  "descripcion": "Ja Rule",
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    "id": 83,
    "name": "The Pussycat Dolls",
    "descripcion": "The Pussycat Dolls",
    "image": "https://api.deezer.com/artist/83/image",
    "created_at": "2005-09-13"
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    "id": 397,
    "name": "Obie Trice",
    "descripcion": "Obie Trice",
    "image": "https://api.deezer.com/artist/397/image",
    "created_at": "2006-08-12"
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    "year": 2003,
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    "created_at": "2003-01-01"
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    "id": 507102991,
    "artist": 189865937,
    "title": "Как тебя забыть 2",
    "descripcion": "Как тебя забыть 2",
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    "image": "https://api.deezer.com/album/507102991/image",
    "created_at": "2023-11-17"
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    "artist": 196556777,
    "title": "Seven Keys to the Discomfort of Being",
    "descripcion": "Seven Keys to the Discomfort of Being",
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    "created_at": "2023-04-21"
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      "title": "Before The Dawn Heals Us",
      "descripcion": "Before The Dawn Heals Us",
      "year": 2014,
      "image": "https://api.deezer.com/album/8316424/image",
      "created_at": "2014-08-22"
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      "id": 287782,
      "artist": 983,
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      "descripcion": "Patti LaBelle: Classic Moments",
      "year": 2005,
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      "created_at": "2005-01-01"
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      "id": 258963,
      "artist": 138,
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      "descripcion": "R.U.L.E.",
      "year": 2004,
      "image": "https://api.deezer.com/album/258963/image",
      "created_at": "2004-01-01"
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      "artist": 4988,
      "title": "1st Born Second",
      "descripcion": "1st Born Second",
      "year": 2001,
      "image": "https://api.deezer.com/album/162018/image",
      "created_at": "2001-03-26"
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      "artist": 83,
      "title": "PCD",
      "descripcion": "PCD",
      "year": 2005,
      "image": "https://api.deezer.com/album/2307131/image",
      "created_at": "2005-09-13"
    },
    {

      "id": 161381,
      "artist": 397,
      "title": "Second Rounds On Me",
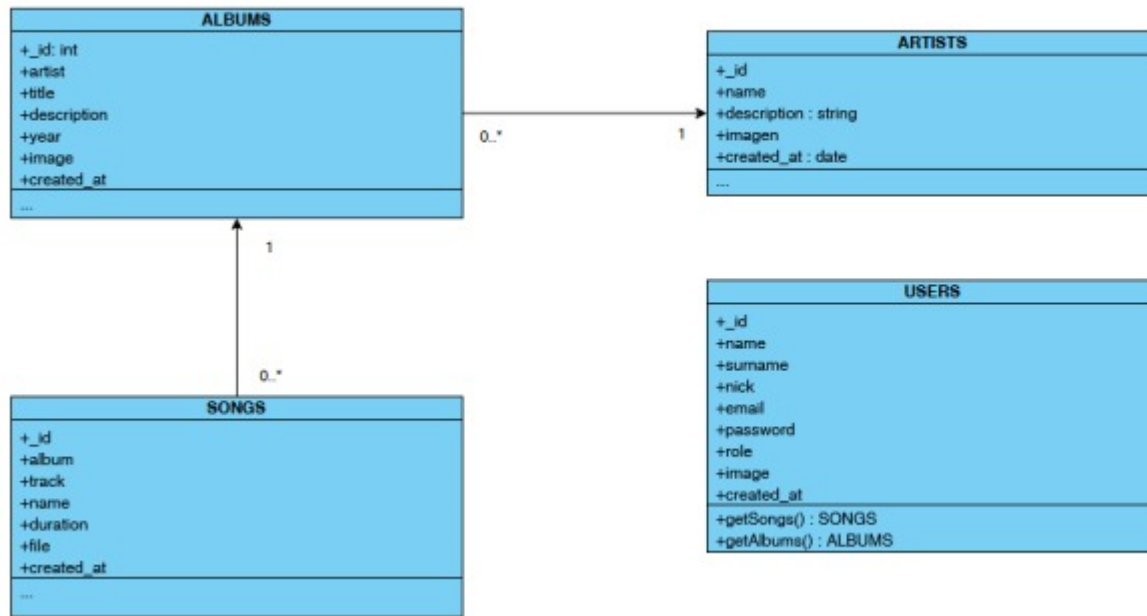   "descripcion": "Second Rounds On Me",
      "year": 2006,

```
    "image": "https://api.deezer.com/album/161381/image",
    "created_at": "2006-08-12"
}]
```

3. Diseño de la base de datos

3.1. Diseño Conceptual

En la figura se observa la relación entre las entidades "ALBUMS" y "ARTISTS": (a) un artista puedes tener varios albunes.

Además, observamos la relación entre "SONGS" y "ALBUMS" donde: (a) en un álbum puede que no haya ninguna canción; pero una canción está en un álbum especifico o en varios álbumes. Para especificar la relación anterior hemos tenido en cuenta los álbumes recopilatorios; "Un álbum recopilatorio es un álbum de canciones grabadas por diferentes artistas, o bien un álbum de canciones grabadas en diferentes álbumes por un mimo artista"

3.2. Diseño físico

- SONGS = db.SONGS
- ALBUMS = db.ALBUMS
- ARTIST = db.ARTIST
- USERS = db.USERS

Hemos decidido seleccionar un diseño de modelado de datos en documentos y con referencia
debido a que en nuestro diseño existen relaciones de uno a muchos.

4. Despliegue de la base de datos

Se Instala la librería pymongo

```
!pip install pymongo
```

```
Collecting pymongo
  Downloading pymongo-4.6.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86
                                          ━━━━━━━━ 677.1/677.1 kB 9.8 MB/s et
Collecting dnspython<3.0.0,>=1.16.0 (from pymongo)
  Downloading dnspython-2.4.2-py3-none-any.whl (300 kB)
                                          ━━━━━━━━ 300.4/300.4 kB 31.0 MB/s e
Installing collected packages: dnspython, pymongo
Successfully installed dnspython-2.4.2 pymongo-4.6.0
```

Se utiliza la librería pymongo

```
import pymongo
```

Usaremos también la librería pprint para ver mejor los resultados de las impresiones

```
from pprint import pprint
```

En el siguiente código proporcionaremos las credenciales de MongoDB a sus respectivas
variables.

- **maquina:** nombre de la máquina/host (el que aloja) la base de datos.
- **puerto:** puerto de la base de datos.
- **uri_mongo** :Nombre de la base de datos.

y posteriormente crearemos la conexión con la base de datos de MongoDB

```
##uri_mongo = "mongodb+srv://nilfern:<contraseña>@<cluster>/?retryWrites=true&w=majority"
uri_mongo = "mongodb+srv://nilfern:ohvSEanctebeQkTZ@cluster0.gmy7nyb.mongodb.net/"
#OTRA OPCIÓN SERÍA:
#uri_mongo = "mongodb+srv://lorena0292:22Septiembre2022@cluster0.bhkw0et.mongodb.net/"
```

```
#maquina = 'localhost'
#puerto = '27017'
#uri_mongo = "mongodb://" + maquina + ":" + puerto +  "/"

conexion = pymongo.MongoClient(uri_mongo)
db = conexion.housemusic
```

Mediante el siguiente código creamos las colecciones SONGS, ÁLBUMS, ARTIST y USERS:

```
#  Las tablas de base de datos son collections (colecciones). Guardamos en las siguientes
SONGS = db.SONGS
ALBUMS = db.ALBUMS
ARTIST = db.ARTIST
USERS = db.USERS
#db.createCollection('SONGS')
#db.createCollection('ALBUMS')
#db.createCollection('ARTIST')
#db.createCollection('USERS')
```

A continuación, realizamos las inserciones de las canciones (contenido del fichero JSON que hemos descargado de la api) y que anteriormente hemos almacenado en la variable documentosSONGS:

```
# Insertar varios documentos

SONGS.insert_many(documentosSONGS)

    InsertManyResult([ObjectId('6560ee13c3a5146e84a128bf'),
    ObjectId('6560ee13c3a5146e84a128c0'), ObjectId('6560ee13c3a5146e84a128c1'),
    ObjectId('6560ee13c3a5146e84a128c2'), ObjectId('6560ee13c3a5146e84a128c3'),
    ObjectId('6560ee13c3a5146e84a128c4'), ObjectId('6560ee13c3a5146e84a128c5'),
    ObjectId('6560ee13c3a5146e84a128c6'), ObjectId('6560ee13c3a5146e84a128c7'),
    ObjectId('6560ee13c3a5146e84a128c8'), ObjectId('6560ee13c3a5146e84a128c9'),
    ObjectId('6560ee13c3a5146e84a128ca'), ObjectId('6560ee13c3a5146e84a128cb'),
    ObjectId('6560ee13c3a5146e84a128cc'), ObjectId('6560ee13c3a5146e84a128cd'),
    ObjectId('6560ee13c3a5146e84a128ce'), ObjectId('6560ee13c3a5146e84a128cf'),
    ObjectId('6560ee13c3a5146e84a128d0'), ObjectId('6560ee13c3a5146e84a128d1'),
    ObjectId('6560ee13c3a5146e84a128d2'), ObjectId('6560ee13c3a5146e84a128d3'),
    ObjectId('6560ee13c3a5146e84a128d4'), ObjectId('6560ee13c3a5146e84a128d5'),
    ObjectId('6560ee13c3a5146e84a128d6'), ObjectId('6560ee13c3a5146e84a128d7'),
    ObjectId('6560ee13c3a5146e84a128d8'), ObjectId('6560ee13c3a5146e84a128d9'),
    ObjectId('6560ee13c3a5146e84a128da'), ObjectId('6560ee13c3a5146e84a128db'),
    ObjectId('6560ee13c3a5146e84a128dc'), ObjectId('6560ee13c3a5146e84a128dd'),
    ObjectId('6560ee13c3a5146e84a128de'), ObjectId('6560ee13c3a5146e84a128df'),
    ObjectId('6560ee13c3a5146e84a128e0'), ObjectId('6560ee13c3a5146e84a128e1'),
    ObjectId('6560ee13c3a5146e84a128e2'), ObjectId('6560ee13c3a5146e84a128e3'),
    ObjectId('6560ee13c3a5146e84a128e4'), ObjectId('6560ee13c3a5146e84a128e5'),
    ObjectId('6560ee13c3a5146e84a128e6'), ObjectId('6560ee13c3a5146e84a128e7'),
    ObjectId('6560ee13c3a5146e84a128e8'), ObjectId('6560ee13c3a5146e84a128e9'),
    ObjectId('6560ee13c3a5146e84a128ea'), ObjectId('6560ee13c3a5146e84a128eb'),
    ObjectId('6560ee13c3a5146e84a128ec'), ObjectId('6560ee13c3a5146e84a128ed'),
```

```
ObjectId('6560ee13c3a5146e84a128ee'),  ObjectId('6560ee13c3a5146e84a128ef'),
ObjectId('6560ee13c3a5146e84a128f0'),  ObjectId('6560ee13c3a5146e84a128f1'),
ObjectId('6560ee13c3a5146e84a128f2'),  ObjectId('6560ee13c3a5146e84a128f3'),
ObjectId('6560ee13c3a5146e84a128f4'),  ObjectId('6560ee13c3a5146e84a128f5'),
ObjectId('6560ee13c3a5146e84a128f6'),  ObjectId('6560ee13c3a5146e84a128f7'),
ObjectId('6560ee13c3a5146e84a128f8'),  ObjectId('6560ee13c3a5146e84a128f9'),
ObjectId('6560ee13c3a5146e84a128fa'),  ObjectId('6560ee13c3a5146e84a128fb'),
ObjectId('6560ee13c3a5146e84a128fc'),  ObjectId('6560ee13c3a5146e84a128fd'),
ObjectId('6560ee13c3a5146e84a128fe'),  ObjectId('6560ee13c3a5146e84a128ff'),
ObjectId('6560ee13c3a5146e84a12900'),  ObjectId('6560ee13c3a5146e84a12901'),
ObjectId('6560ee13c3a5146e84a12902'),  ObjectId('6560ee13c3a5146e84a12903'),
ObjectId('6560ee13c3a5146e84a12904'),  ObjectId('6560ee13c3a5146e84a12905'),
ObjectId('6560ee13c3a5146e84a12906'),  ObjectId('6560ee13c3a5146e84a12907'),
ObjectId('6560ee13c3a5146e84a12908'),  ObjectId('6560ee13c3a5146e84a12909'),
ObjectId('6560ee13c3a5146e84a1290a'),  ObjectId('6560ee13c3a5146e84a1290b'),
ObjectId('6560ee13c3a5146e84a1290c'),  ObjectId('6560ee13c3a5146e84a1290d'),
ObjectId('6560ee13c3a5146e84a1290e'),  ObjectId('6560ee13c3a5146e84a1290f'),
ObjectId('6560ee13c3a5146e84a12910'),  ObjectId('6560ee13c3a5146e84a12911'),
ObjectId('6560ee13c3a5146e84a12912'),  ObjectId('6560ee13c3a5146e84a12913'),
ObjectId('6560ee13c3a5146e84a12914'),  ObjectId('6560ee13c3a5146e84a12915'),
ObjectId('6560ee13c3a5146e84a12916'),  ObjectId('6560ee13c3a5146e84a12917'),
ObjectId('6560ee13c3a5146e84a12918'),  ObjectId('6560ee13c3a5146e84a12919'),
ObjectId('6560ee13c3a5146e84a1291a'),  ObjectId('6560ee13c3a5146e84a1291b'),
ObjectId('6560ee13c3a5146e84a1291c'),  ObjectId('6560ee13c3a5146e84a1291d'),
ObjectId('6560ee13c3a5146e84a1291e'),  ObjectId('6560ee13c3a5146e84a1291f'),
ObjectId('6560ee13c3a5146e84a12920'),  ObjectId('6560ee13c3a5146e84a12921'),
ObjectId('6560ee13c3a5146e84a12922'),  ObjectId('6560ee13c3a5146e84a12923'),
ObjectId('6560ee13c3a5146e84a12924'),  ObjectId('6560ee13c3a5146e84a12925'),
ObjectId('6560ee13c3a5146e84a12926'),  ObjectId('6560ee13c3a5146e84a12927'),
ObjectId('6560ee13c3a5146e84a12928'),  ObjectId('6560ee13c3a5146e84a12929'),
ObjectId('6560ee13c3a5146e84a1292a'),  ObjectId('6560ee13c3a5146e84a1292b'),
ObjectId('6560ee13c3a5146e84a1292c'),  ObjectId('6560ee13c3a5146e84a1292d'),
ObjectId('6560ee13c3a5146e84a1292e'),  ObjectId('6560ee13c3a5146e84a1292f'),
ObjectId('6560ee13c3a5146e84a12930'),  ObjectId('6560ee13c3a5146e84a12931'),
```

De nuevo, hacemos lo mismo pero con los datos de los álbums.

```
# Insertar varios documentos

ALBUMS.insert_many(documentosalbum)

    InsertManyResult([ObjectId('6560ee1dc3a5146e84a12949'),
    ObjectId('6560ee1dc3a5146e84a1294a'),  ObjectId('6560ee1dc3a5146e84a1294b'),
    ObjectId('6560ee1dc3a5146e84a1294c'),  ObjectId('6560ee1dc3a5146e84a1294d'),
    ObjectId('6560ee1dc3a5146e84a1294e'),  ObjectId('6560ee1dc3a5146e84a1294f'),
    ObjectId('6560ee1dc3a5146e84a12950'),  ObjectId('6560ee1dc3a5146e84a12951'),
    ObjectId('6560ee1dc3a5146e84a12952')], acknowledged=True)
```

Insertamos ahora los datos de los artistas en la collección ARTIST

```
# Insertar varios documentos

ARTIST.insert_many(documentosartist)
```

```
InsertManyResult([ObjectId('6560ee21c3a5146e84a12953'),
ObjectId('6560ee21c3a5146e84a12954'), ObjectId('6560ee21c3a5146e84a12955'),
ObjectId('6560ee21c3a5146e84a12956'), ObjectId('6560ee21c3a5146e84a12957'),
ObjectId('6560ee21c3a5146e84a12958'), ObjectId('6560ee21c3a5146e84a12959'),
ObjectId('6560ee21c3a5146e84a1295a'), ObjectId('6560ee21c3a5146e84a1295b'),
ObjectId('6560ee21c3a5146e84a1295c')], acknowledged=True)
```

▾ 5. Consultas a base de datos.

Para comprobar las anteriores inserciones, realizamos las siguientes consultas:

1) Se consulta una canción (documento) de la colección SONGS de la base de datos

```
print(SONGS.find_one())
```

```
{'_id': ObjectId('6560ee13c3a5146e84a128bf'), 'id': 15515240, 'album': 1433384,
```

2) Buscamos la canción llamada dile en la colección SONGS

```
print(SONGS.find_one({"name": "Dile"}))
```

```
{'_id': ObjectId('6560ee13c3a5146e84a128c2'), 'id': 15515244, 'album': 1433384,
```

3) Mostramos solo los nombres de todas las canciones (sin el id)

```
s=SONGS.find({},{"name":1,"_id":0})
for i in s:
  pprint(i)
```

```
{'name': 'Intro (Album Version)'}
{'name': 'Dale Don Mas Duro (Album Version)'}
{'name': 'Intocable'}
{'name': 'Dile'}
{'name': 'Aunque Te Fuiste'}
{'name': 'La Noche Esta Buena (Album Version)'}
{'name': 'Provócandome'}
{'name': 'Caserios #2 (Album Version)'}
{'name': 'Quien La Vio Llorar (Album Version)'}
{'name': 'Perreando (Remix)'}
{'name': 'Tu Cuerpo Me Arrebata'}
{'name': 'La Recompenza (Album Version)'}
{'name': 'Guayaquil (Album Version)'}
{'name': 'Intocable (Remix)'}
{'name': 'Dale Don Dale'}
{'name': 'Как тебя забыть 2'}
```

```
{'name': 'Как тебя забыть 2 (sped up)'}
{'name': '*'}
{'name': 'Grovel'}
{'name': '*(struggling..)'}
{'name': 'Endless Return to the Kingdom of Sleep'}
{'name': 'Seeds of Frustration'}
{'name': 'The Well Within'}
{'name': 'Shedding Weathered Skin'}
{'name': 'Funerary Vision'}
{'name': 'All About Us'}
{'name': 'All The Things She Said'}
{'name': 'Not Gonna Get Us'}
{'name': 'How Soon Is Now?'}
{'name': 'Loves Me Not'}
{'name': 'Friend or Foe'}
{'name': 'Gomenasai'}
{'name': 'Null And Void (Non-LP Version)'}
{'name': 'Cosmos (Outer Space) (She Wants Revenge Remix)'}
{'name': 'Show Me Love (Radio Edit)'}
{'name': "Craving (I Only Want What I Can't Have) (Bollywood Mix)"}
{'name': 'Ne Ver, Ne Boisia (Eurovision 2003 Version)'}
{'name': '30 Minutes'}
{'name': 'Divine (Long Version)'}
{'name': 'Perfect Enemy'}
{'name': 'All The Things She Said (Extension 119 Club Edit)'}
{'name': 'Ludi Invalidi (Russian Version Remix)'}
{'name': 'Loves Me Not (Guena G Remix Edit)'}
{'name': 'Nas Ne Dagoniat'}
{'name': 'Ya Soshla S Uma'}
{'name': 'Moonchild'}
{'name': "Don't Save Us From The Flames"}
{'name': "In The Cold I'm Standing"}
{'name': 'Farewell / Goodbye'}
{'name': 'Fields, Shorelines And Hunters'}
{'name': '*'}
{'name': "I Guess I'm Floating"}
{'name': 'Teen Angst'}
{'name': "Can't Stop"}
{'name': 'Safe'}
{'name': 'Let Men Burn Stars'}
{'name': 'Car Chase Terror !'}
{'name': 'Slight Night Shiver'}
```

4) Se realiza una consulta avanzada donde se muestran todas las canciones que tiene un album

```python
for org in ALBUMS.aggregate([{
    '$lookup': {
        'from': "SONGS",
        'localField': "id",
        'foreignField': "album",
        'as': "SONGS"
    }
}]):
print("----",org["title"],"----")
for musica in org["SONGS"]:
```

```
print(musica["name"])
```

---- The Last Don ----
Intro (Album Version)
Dale Don Mas Duro (Album Version)
Intocable
Dile
Aunque Te Fuiste
La Noche Esta Buena (Album Version)
Provócandome
Caserios #2 (Album Version)
Quien La Vio Llorar (Album Version)
Perreando (Remix)
Tu Cuerpo Me Arrebata
La Recompenza (Album Version)
Guayaquil (Album Version)
Intocable (Remix)
Dale Don Dale
---- Как тебя забыть 2 ----
Как тебя забыть 2
Как тебя забыть 2 (sped up)
*
---- Seven Keys to the Discomfort of Being ----
Grovel
*(struggling..)
Endless Return to the Kingdom of Sleep
Seeds of Frustration
The Well Within
Shedding Weathered Skin
Funerary Vision
---- t.A.T.u. - The Best ----
All About Us
All The Things She Said
Not Gonna Get Us
How Soon Is Now?
Loves Me Not
Friend or Foe
Gomenasai
Null And Void (Non-LP Version)
Cosmos (Outer Space) (She Wants Revenge Remix)
Show Me Love (Radio Edit)
Craving (I Only Want What I Can't Have) (Bollywood Mix)
Ne Ver, Ne Boisia (Eurovision 2003 Version)
30 Minutes
Divine (Long Version)
Perfect Enemy
All The Things She Said (Extension 119 Club Edit)
Ludi Invalidi (Russian Version Remix)
Loves Me Not (Guena G Remix Edit)
Nas Ne Dagoniat
Ya Soshla S Uma
---- Before The Dawn Heals Us ----
Moonchild
Don't Save Us From The Flames
In The Cold I'm Standing

```
Farewell / Goodbye
Fields, Shorelines And Hunters
*
I Guess I'm Floating
Teen Angst
```

5) Listado de cancione de un album especifico

```
for org in SONGS.aggregate([
  {
    '$match': {
      'album': 1433384
    }
  },
  {
    '$lookup': {
      'from': "ALBUMS",
      'localField': "album",
      'foreignField': "id",
      'as': "albumInfo"
    }
  },
  {
    '$unwind': "$albumInfo"
  },
  {
    '$sort': {
      'track': 1
    }
  }
]):

  print(org["albumInfo"]["title"],": ",org["name"])

    The Last Don :  Intro (Album Version)
    The Last Don :  Dale Don Mas Duro (Album Version)
    The Last Don :  Intocable
    The Last Don :  Dile
    The Last Don :  Aunque Te Fuiste
    The Last Don :  La Noche Esta Buena (Album Version)
    The Last Don :  Provócandome
    The Last Don :  Caserios #2 (Album Version)
    The Last Don :  Quien La Vio Llorar (Album Version)
    The Last Don :  Perreando (Remix)
    The Last Don :  Tu Cuerpo Me Arrebata
    The Last Don :  La Recompenza (Album Version)
    The Last Don :  Guayaquil (Album Version)
    The Last Don :  Intocable (Remix)
    The Last Don :  Dale Don Dale
```

6) Albunes entre el 2010 y 2020

```
for org in db.ALBUMS.aggregate(
  [
```

```
  {
    '$match': { 'year': { '$gte': 2010, '$lte': 2020 } }
  }
  ]
):
print(org["title"])
```

    Before The Dawn Heals Us

7) Obtener todos los álbumes de un artista específico

```
for  org in ALBUMS.aggregate([
  {
    '$match': {
      'artist': 725
    }
  },
  {
    '$lookup': {
      'from': "SONGS",
      'localField': "id",
      'foreignField': "album",
      'as': "songs"
    }
  }
]):

print("--",org["title"],"--")
for musica in org["songs"]:
  print(musica["name"])
```

    -- The Last Don --
    Intro (Album Version)
    Dale Don Mas Duro (Album Version)
    Intocable
    Dile
    Aunque Te Fuiste
    La Noche Esta Buena (Album Version)
    Provócandome
    Caserios #2 (Album Version)
    Quien La Vio Llorar (Album Version)
    Perreando (Remix)
    Tu Cuerpo Me Arrebata
    La Recompenza (Album Version)
    Guayaquil (Album Version)
    Intocable (Remix)
    Dale Don Dale

6. Conclusiones

- En el diseño y estructura de la BBDD ampliamos los conocimientos en los modelos de datos
  semiestructurados; aplicando conceptos y características basadas en un diseño NoSQL

orientado a la aplicación web propuesta; la cual posibilitará a los usuarios encontrar de forma rápida y eficiente (poco consumo de recursos) canciones en un banco de música libre y gratuita. Además de garantizar baja latencia. Garantizando la escalabilidad horizontal, gran número de usuarios conectados simultáneamente y optimizando grandes volúmenes de datos.

- Los datos los hemos obtenido utilizando un modelo propio creando un "dataset" con formato JSON; a partir del cual se insertaron los datos en la BBDD propuesta.

- Se implementaron las consultas; focalizándolas en los datos ya introducidos, en primer lugar, hacer pruebas a la BBDD. Revisar si se garantiza la baja latencia; para esto se diseñaron varios tipos de consultas.

- Muchos de los elementos de la base de datos son mostrador en Jupyter Notebook; al ser una aplicación web interactiva de código abierto; nos permitió compartir datos, consultas, visualizaciones y texto narrativo; garantizando de esta forma que otros especialistas pueden comprender de forma adecuada nuestra propuesta.

- Este ABP aportó al equipo conocimiento y experiencia en el trabajo con las herramientas de modelado de datos NoSQL, gestores de BBDD NoSQL, Jupyter Notebook, entre otras consultas realizadas en internet para cumplimentar la actividad; además, aplicando los conocimientos adquiridos en la asignatura Bases de Datos Web.