Colonial Council Bank

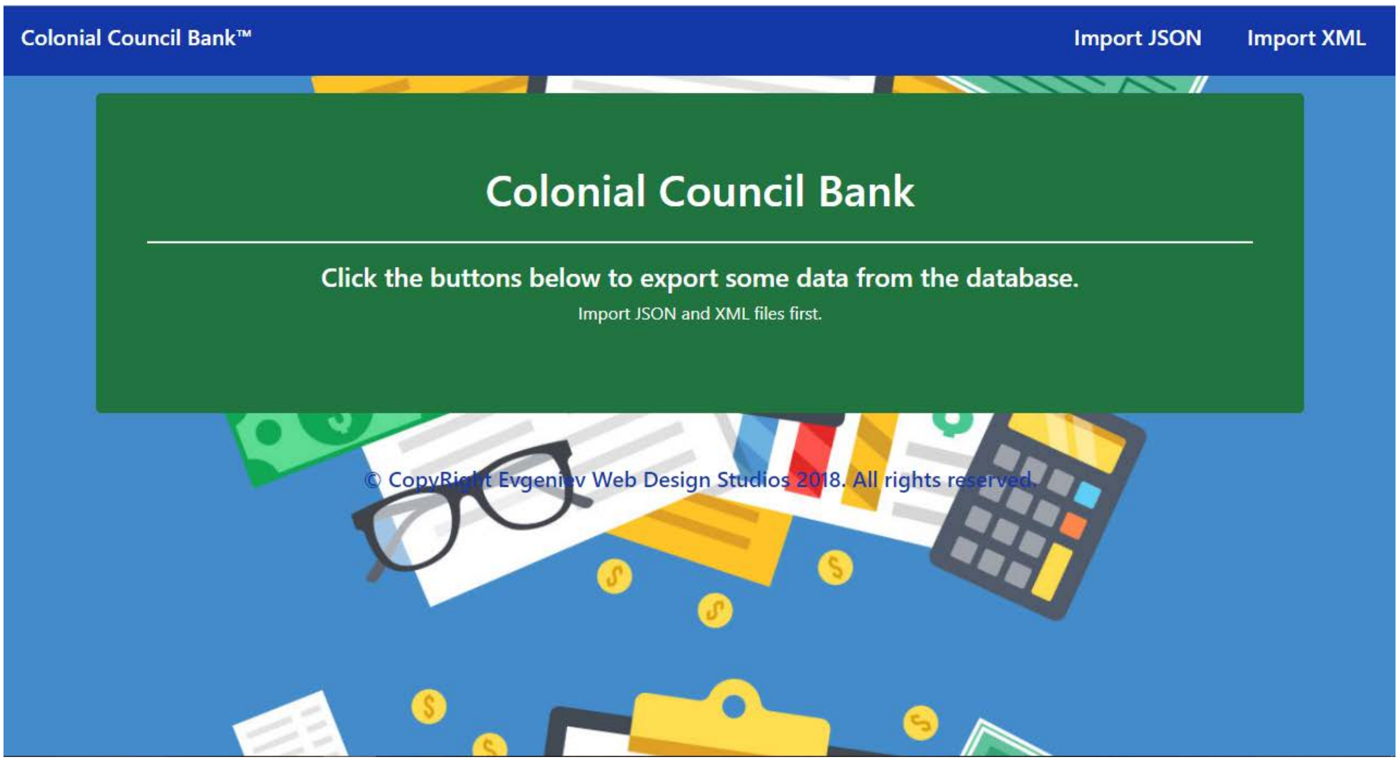
After the success of the Colonial Journey, the Council has decided to establish a bank – Colonial Council Bank. You have been employed by the Council to finish the database layer, which supports basic functionality like importing JSON and XML data and exporting some results.

1. Functionality Overview

The Council has hired you as their application developer, to implement the **database layer**. The application should be able to easily **import** hard-formatted data from **XML** and **JSON** and **support functionality** for also **exporting** the imported data. The application is called – **ccb**.

Look at the pictures below to see what must happen:

- Home page before importing anything:



Colonial Council Bank

Click the buttons below to export some data from the database.

Import JSON and XML files first.

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- Import JSON page before importing anything:

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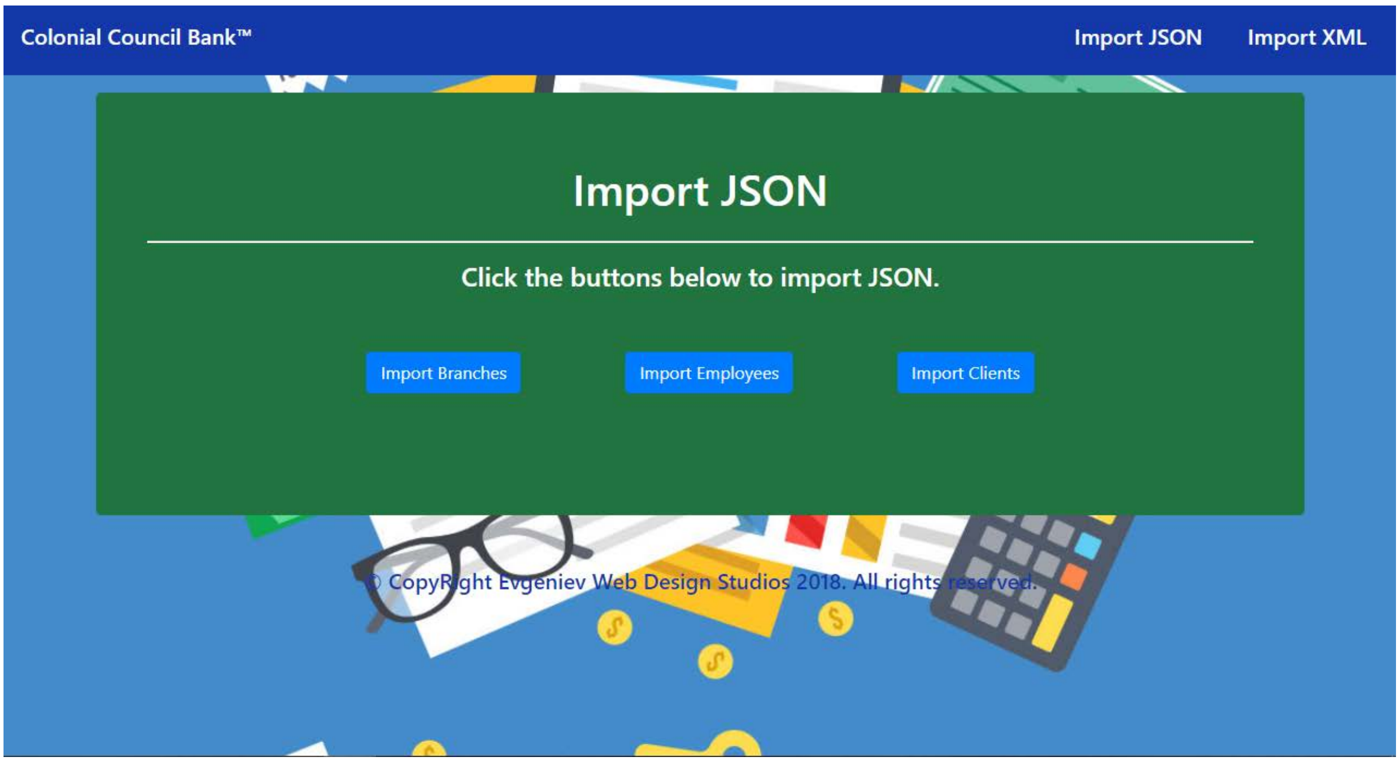

Import JSON

Click the buttons below to import JSON.

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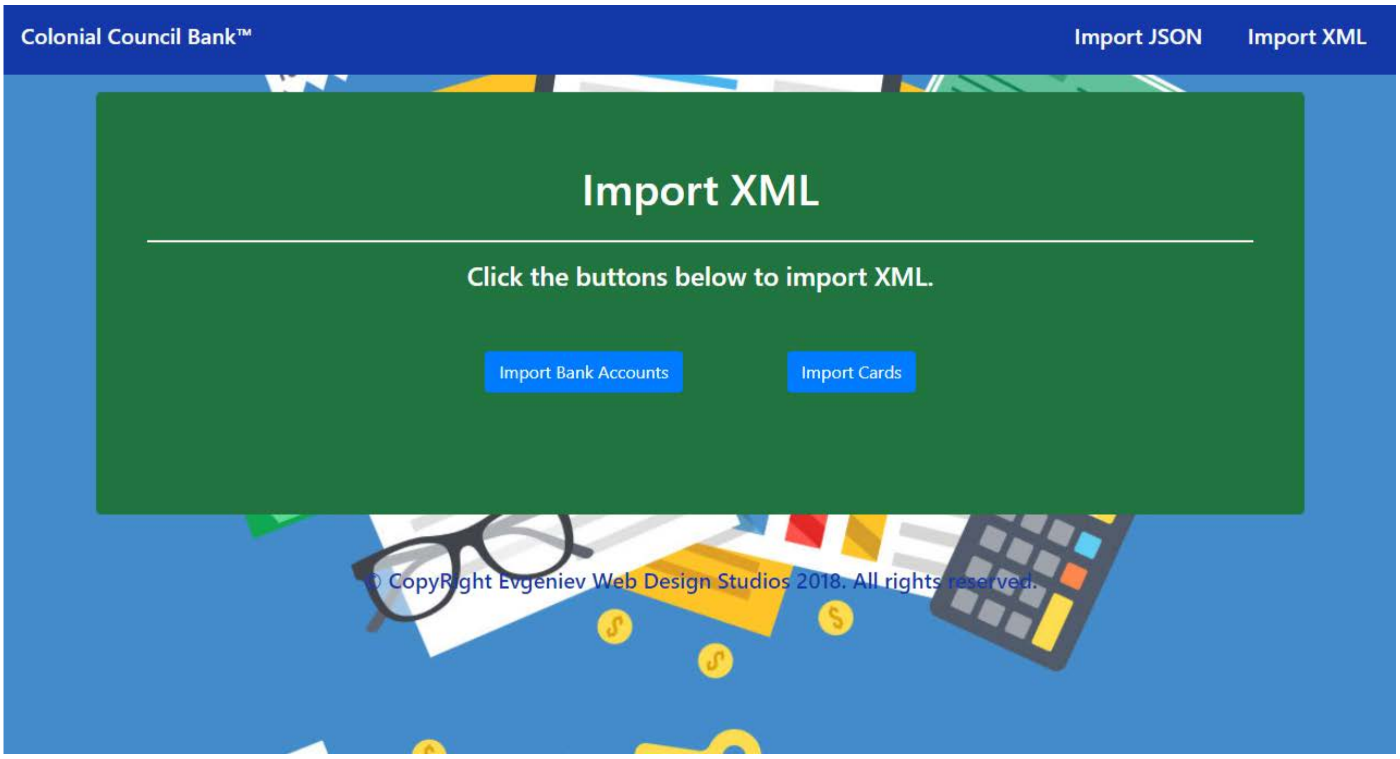
- Import XML page before importing anything:



Import XML

Click the buttons below to import XML.

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- Import Branches page after reading the **branches.json** file:

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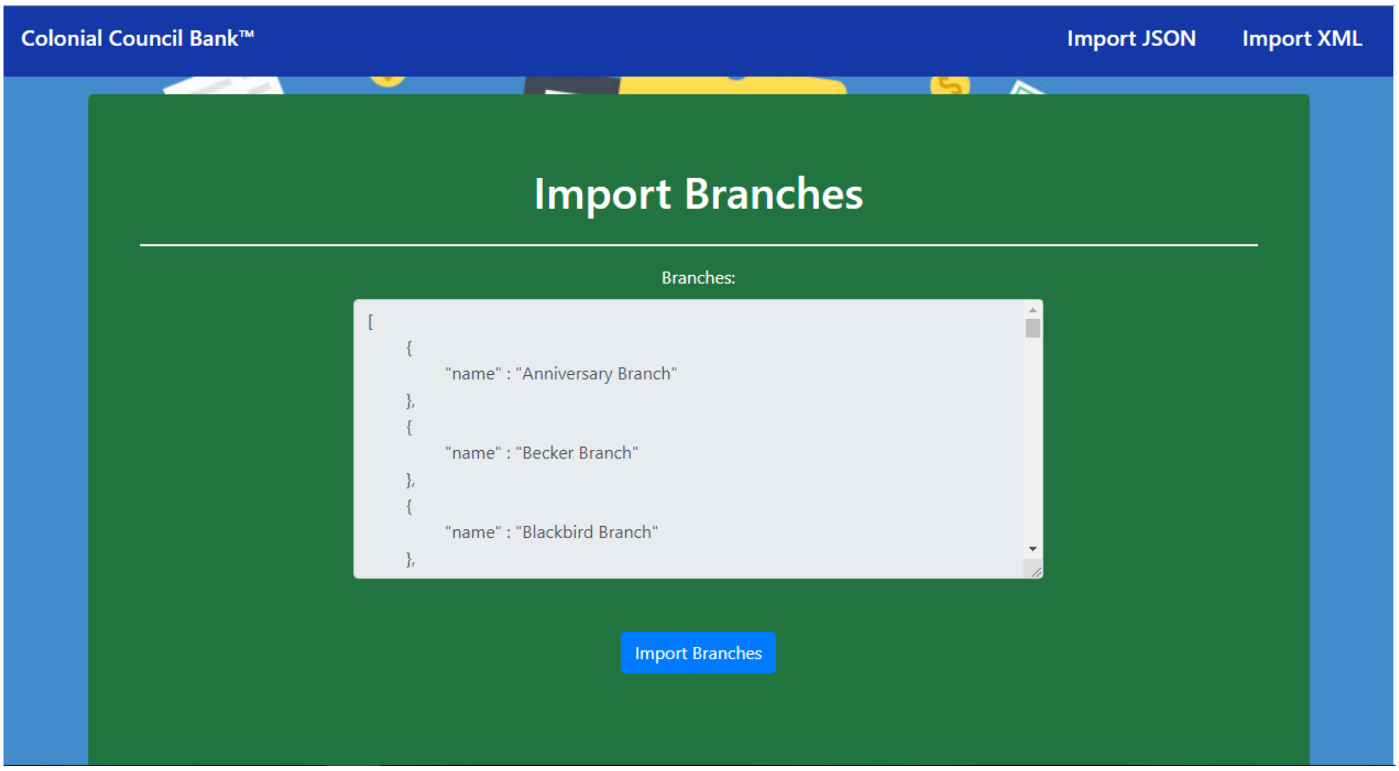
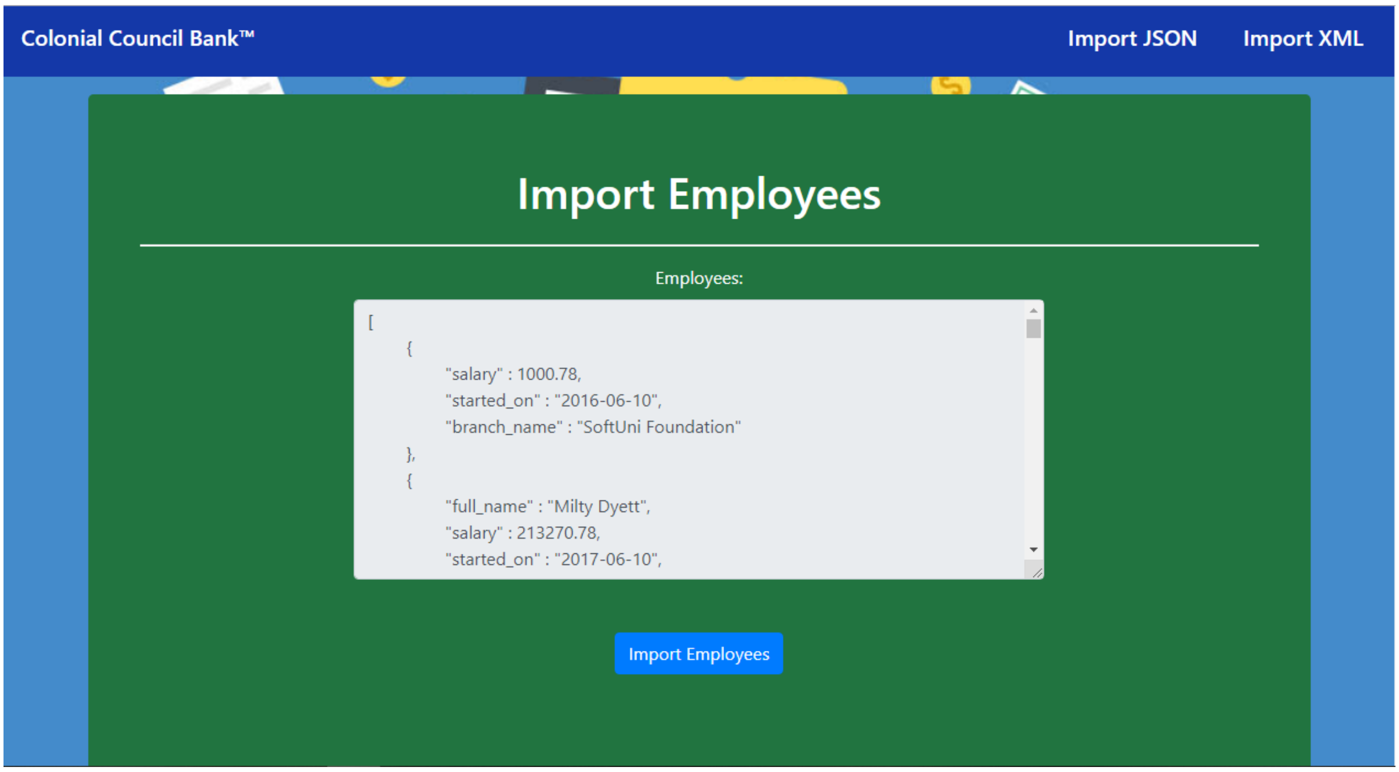


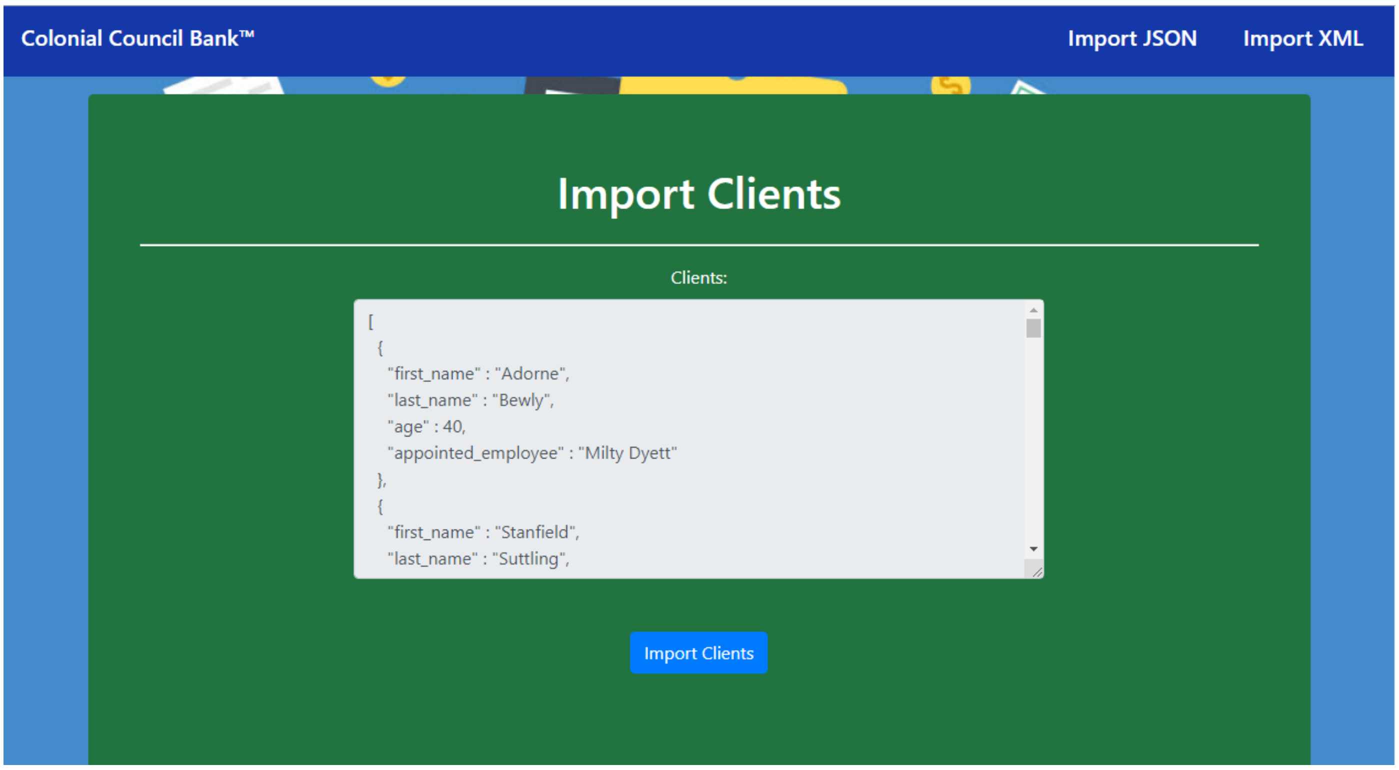
```
[
    {
        "name" : "Anniversary Branch"
    },
    {
        "name" : "Becker Branch"
    },
    {
        "name" : "Blackbird Branch"
    },
```

- Import Employees page after reading the **employees.json** file:



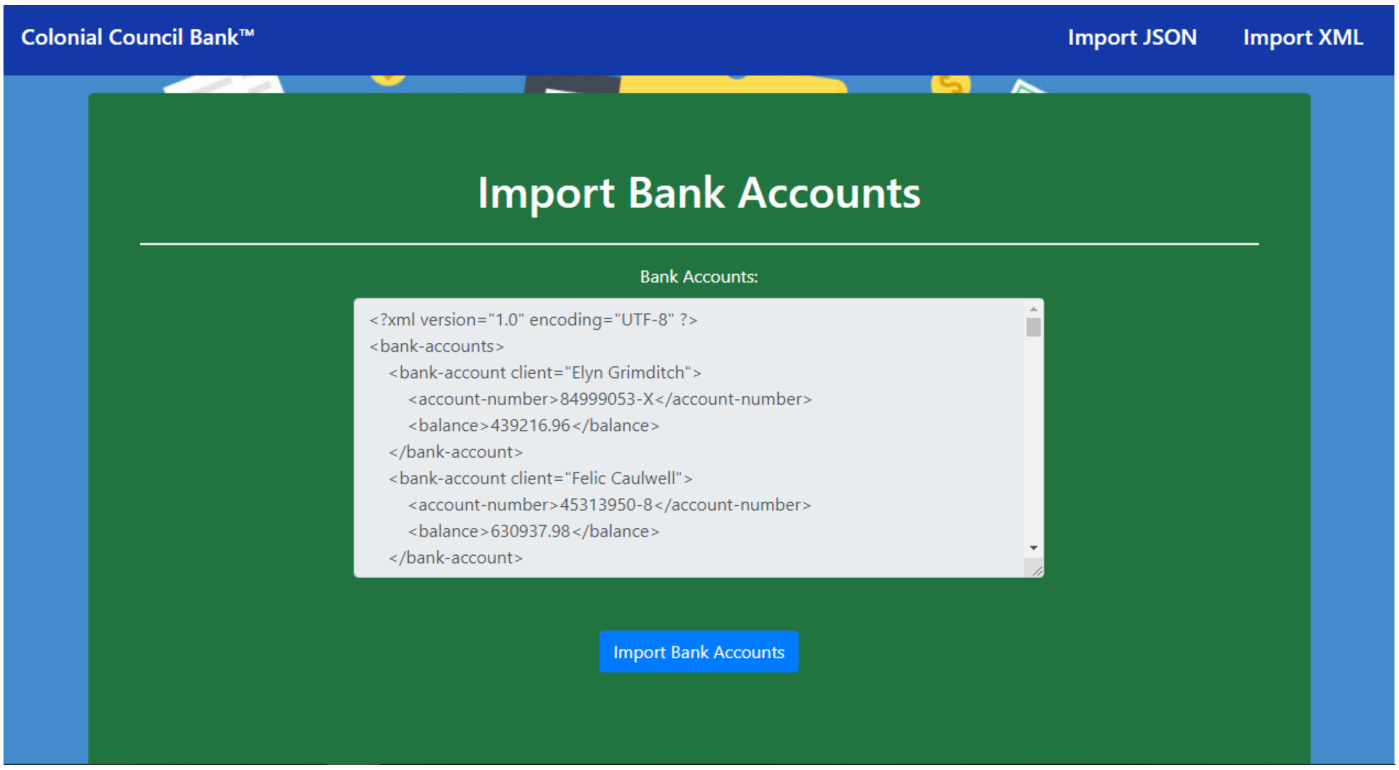
```
[
    {
        "salary" : 1000.78,
        "started_on" : "2016-06-10",
        "branch_name" : "SoftUni Foundation"
    },
    {
        "full_name" : "Milty Dyett",
        "salary" : 213270.78,
        "started_on" : "2017-06-10",
```

- Import Clients page after reading the **clients.json** file:



```
[
 {
   "first_name" : "Adorne",
   "last_name" : "Bewly",
   "age" : 40,
   "appointed_employee" : "Milty Dyett"
 },
 {
   "first_name" : "Stanfield",
   "last_name" : "Suttling",
```

- Import Bank Accounts page after reading **bank-accounts.xml** file:



```
<?xml version="1.0" encoding="UTF-8" ?>
<bank-accounts>
    <bank-account client="Elyn Grimditch">
        <account-number>84999053-X</account-number>
        <balance>439216.96</balance>
    </bank-account>
    <bank-account client="Felic Caulwell">
        <account-number>45313950-8</account-number>
        <balance>630937.98</balance>
    </bank-account>
```

- Import Cards page after reading **cards.xml** file:

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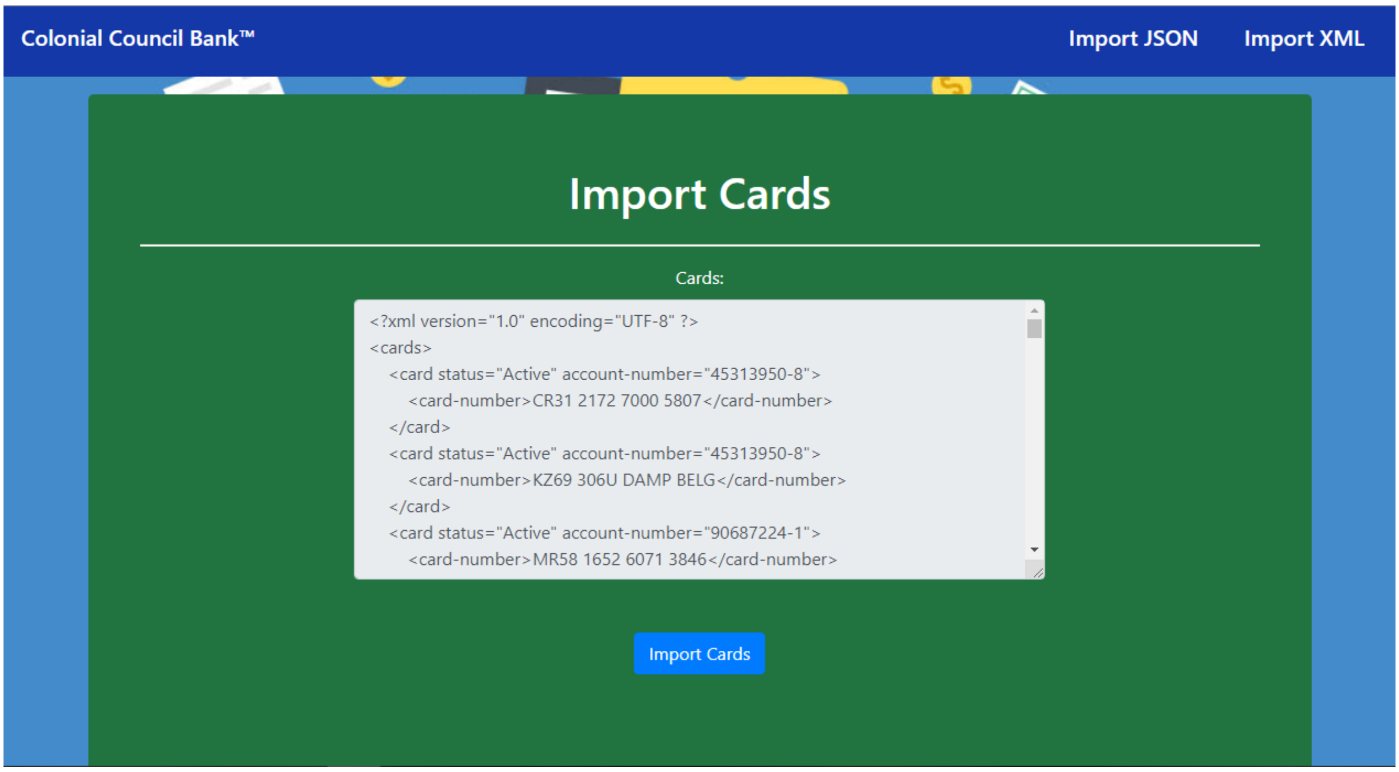
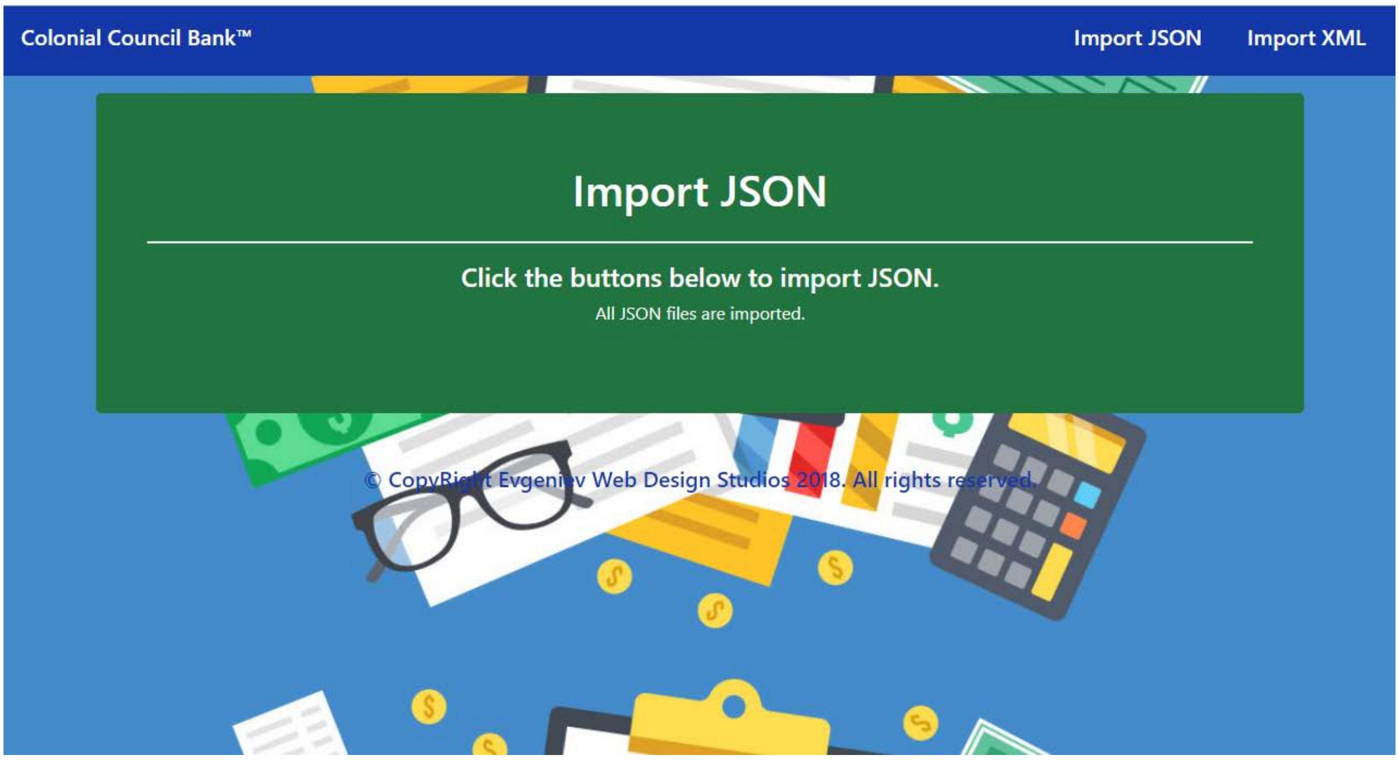


```
<?xml version="1.0" encoding="UTF-8" ?>
<cards>
  <card status="Active" account-number="45313950-8">
    <card-number>CR31 2172 7000 5807</card-number>
  </card>
  <card status="Active" account-number="45313950-8">
    <card-number>KZ69 306U DAMP BELG</card-number>
  </card>
  <card status="Active" account-number="90687224-1">
    <card-number>MR58 1652 6071 3846</card-number>
```

- Import JSON page after importing the given data:



Click the buttons below to import JSON.

All JSON files are imported.

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- Import XML page after importing the given data:

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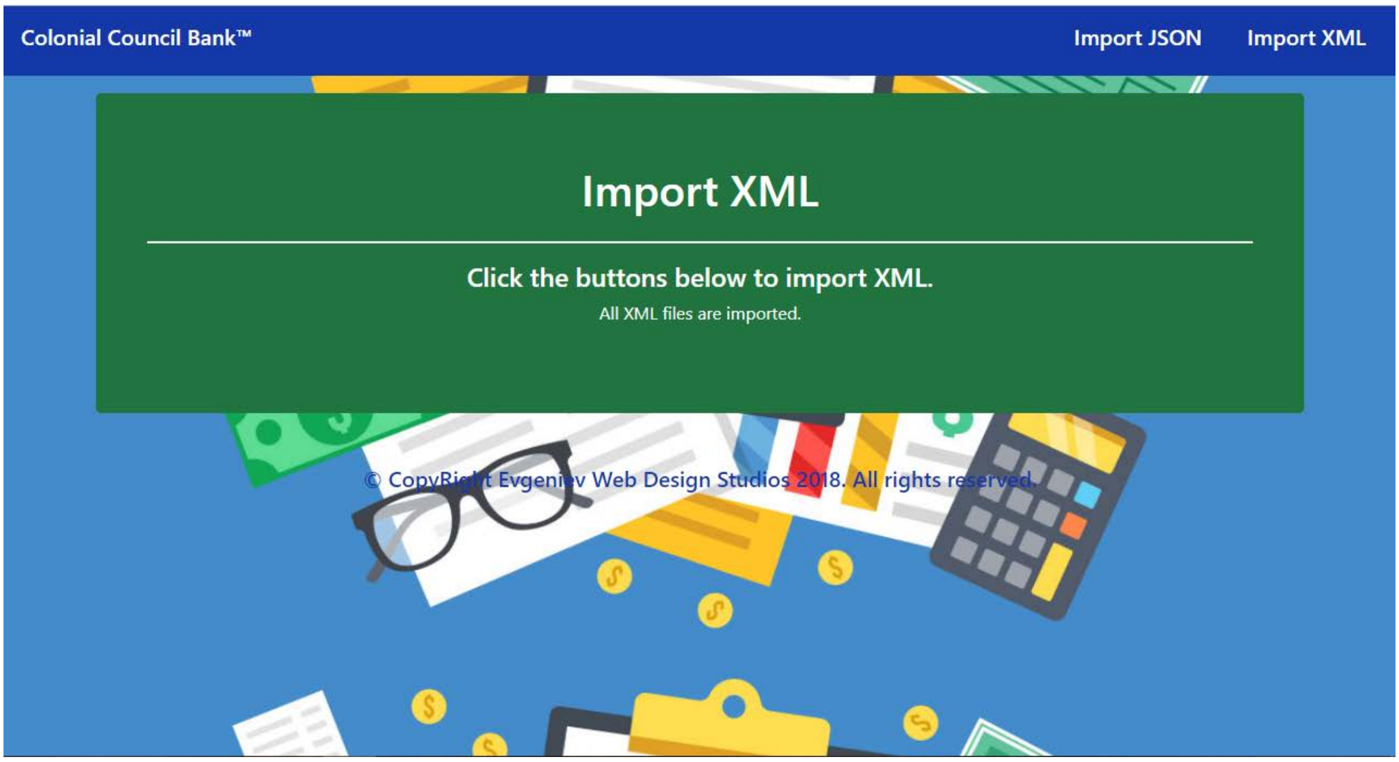

Import XML

Click the buttons below to import XML.

All XML files are imported.

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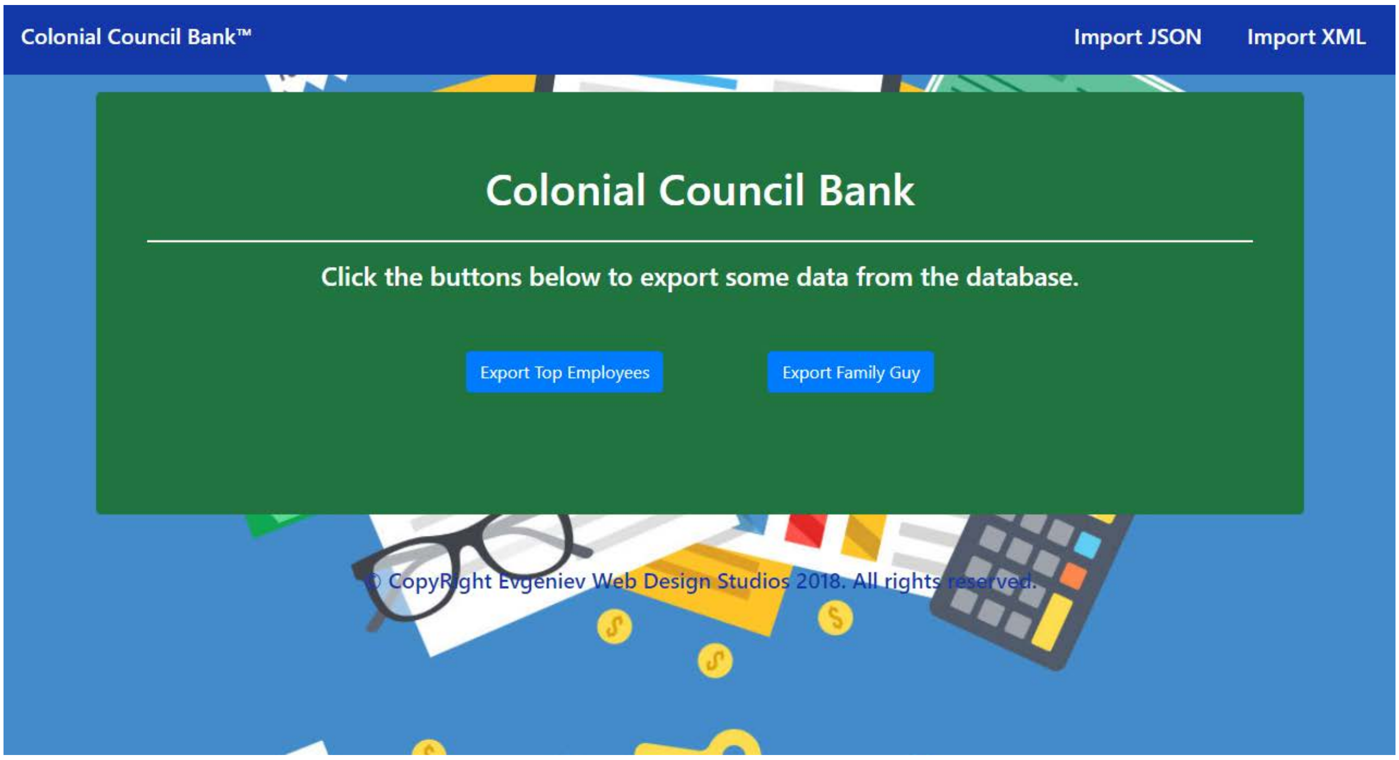
- Home page after importing the given data:



Colonial Council Bank

Click the buttons below to export some data from the database.

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- Export Top Employees page:

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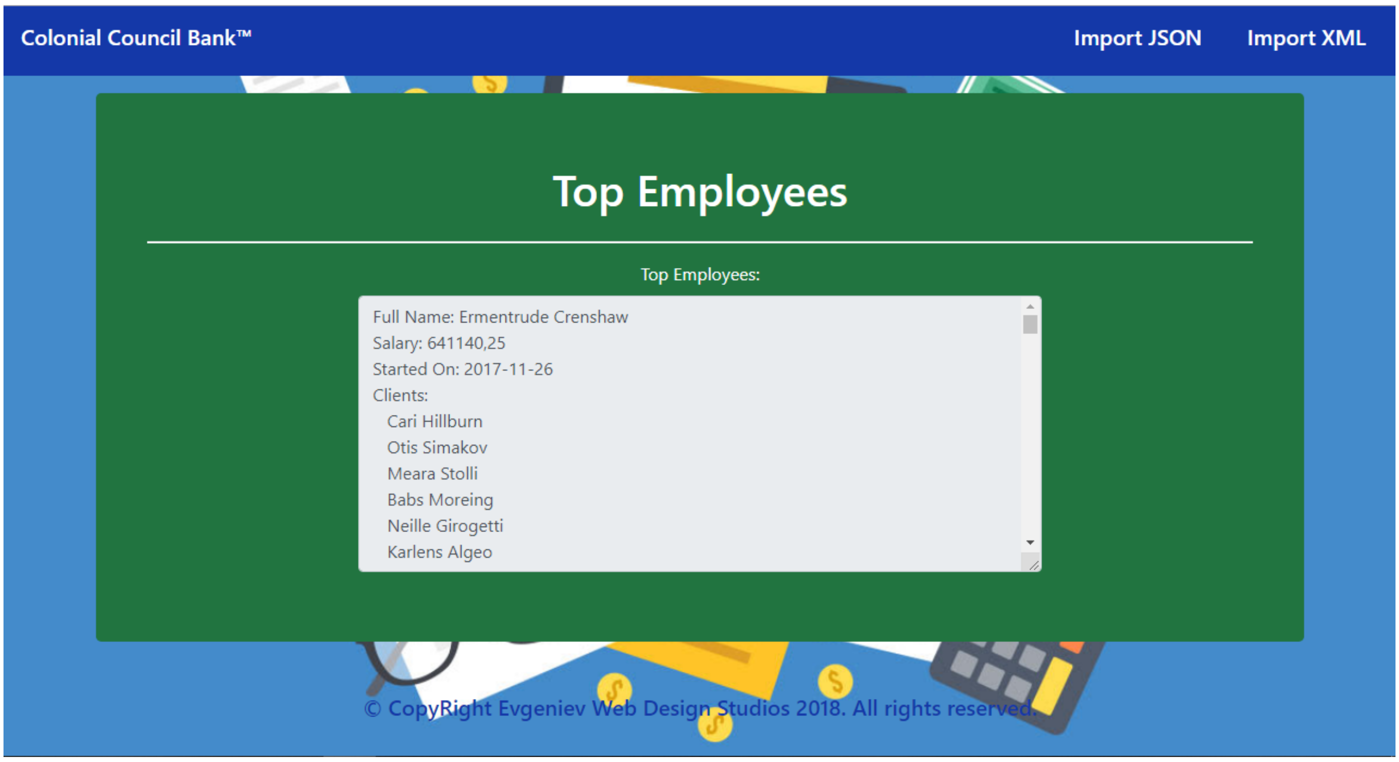

Top Employees

Top Employees:

```
Full Name: Ermentrude Crenshaw
Salary: 641140,25
Started On: 2017-11-26
Clients:
  Cari Hillburn
  Otis Simakov
  Meara Stolli
  Babs Moreing
  Neille Girogetti
  Karlens Algeo
```

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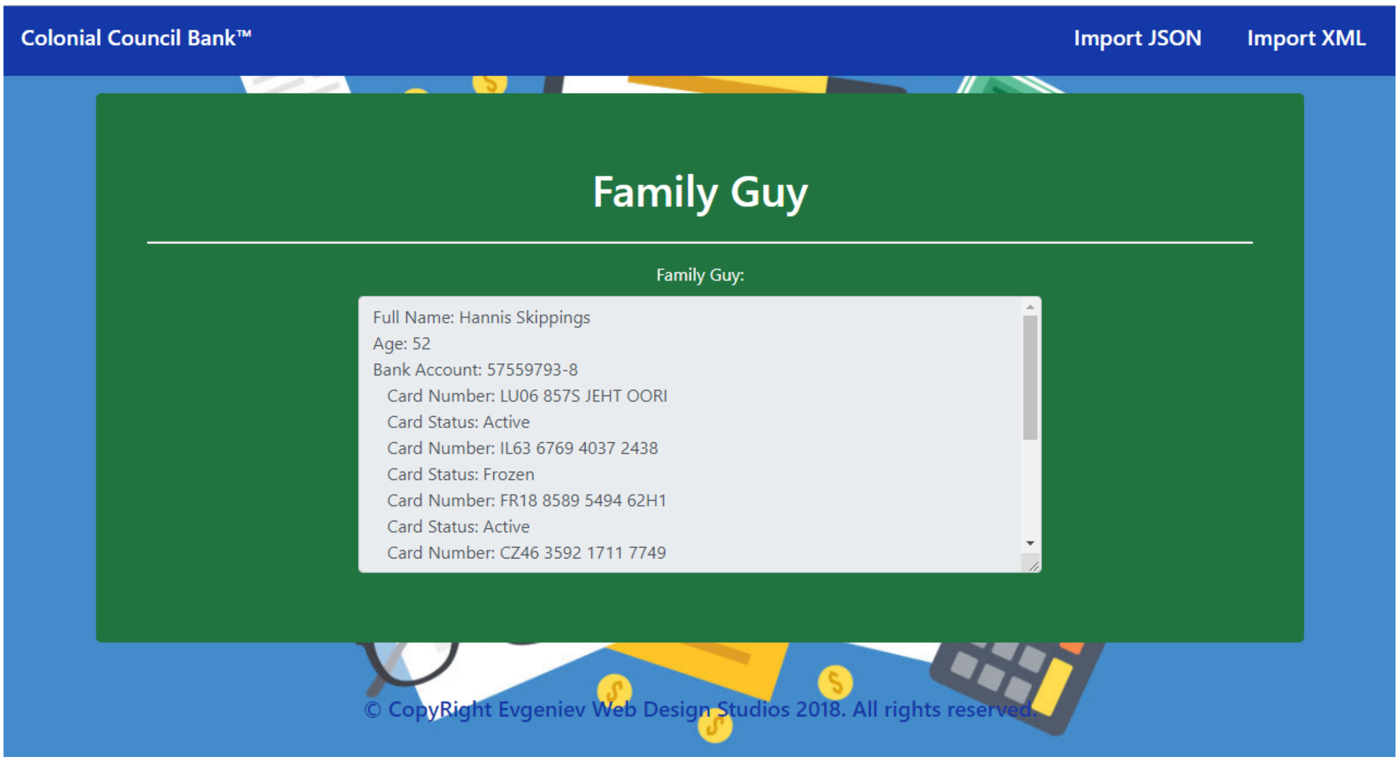
- Export Family Guy page:



Family Guy

Family Guy:

```
Full Name: Hannis Skippings
Age: 52
Bank Account: 57559793-8
  Card Number: LU06 857S JEHT OORI
  Card Status: Active
  Card Number: IL63 6769 4037 2438
  Card Status: Frozen
  Card Number: FR18 8589 5494 62H1
  Card Status: Active
  Card Number: CZ46 3592 1711 7749
```

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2. Project Skeleton Overview

You will be given a **Skeleton**, containing a **certain architecture(MVC)** with **several classes**, some of which – completely empty. The **Skeleton** will include the **files** with which you will **seed** the **database**.

3. Model Definition

There are 5 main models that the **ccb** database application should contain in its functionality.

Design them in the **most appropriate** way, considering the following **data constraints**:

Branch

- `id` – **integer** number, **primary identification field**.
- `name` – a **string** (**required**).

Employee

- `id` – **integer** number, **primary identification field**.
- `first_name` – a **string** (**required**).
- `last_name` – a **string** (**required**).
- `salary` – a **decimal** data type.
- `started_on` – a **Date**.
- `branch` – a **`Branch`** entity (**required**).
- `clients` – a **collection** of **`Client`** entity.

Clients

- `id` – **integer** number, **primary identification field**.
- `full_name` – a **string** (**required**).
- `age` – an **integer** number.
- `bank_account` – a **`Bank Account`** entity (**One**).

Bank Account

- `id` – **integer** number, **primary identification field**.
- `account_number` – a **string** (**required**).
- `balance` – a **decimal** data type.
- `client` – a **`Client`** entity (**One**).
- `cards` – a **collection** of **`Card`** entity.

Card

- `id` – **integer** number, **primary identification field**.
- `card_number` – a **string** (**required**).
- `card_status` – a **string** (**required**).
- `bank_account` – a **`Bank Account`** entity.

NOTE: Name the entities and their class members, **exactly** in the **format stated** above. Do not name them in snake case with the dashes, of course. But if a field is specified as **`bank_account`**, you are to name it **`bankAccount`**.

Relationships

The Council decided to give you a little hint about the more complex relationships in the database, so that you can implement it correctly.

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One **Employee** may have only one **Branch**, and one **Branch** may have many **Employees**.

One **Employee** may have many **Clients**, and one **Client** m ay be appointed to many **Employees**.

A **Client** can have only one **Bank Account**, and one **Bank Account** can have only one **Client**.

One **Card** can have only one **Bank Account**, and one **Bank Account** can have many **Cards**.

4. Data Import

Use the provided **JSON** and **XML** files to populate the database with data. Import all the information from those files into the database.

You are not allowed **to modify the provided JSON and XML files.**

ANY INCORRECT data should be **ignored** and a message "**Error: Incorrect Data!**" should be printed.

- **NOTE**: An incorrect data input is an input which is **missing required fields**.
- There are **no other validation criteria**.

ANY SUCCESSFUL data import should **result** in a message "**Successfully imported {entityClass} - {entityField}.**".

The **entityField** depends on the **entityClass**:

- For **Branch** – **{name}**.
- For **Employee** – a string **composed** in the following format – "**{first_name} {last_name}**".
- For **Client** – **{full_name}**.
- For **BankAccount** – **{account_number}**.
- For **Card** – **{card_number}**.

JSON Import

branches (branches.json)

branches.json

```
[
      { "name" : "Anniversary Branch" },
      { "name" : "Becker Branch" },
      . . .
]
```

```
Successfully imported Branch - Anniversary Branch.
Successfully imported Branch - Becker Branch.
. . .
```

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Employees (employees.json)

employees.json

```
[
	{
		"full_name" : "Milty Dyett",
		"salary" : 213270.78,
		"started_on" : "2017-06-10",
		"branch_name" : "Mendota Branch",

	},
	{
		"full_name" : "Ermentrude Crenshaw",
		"salary" : 641140.25,
		"started_on" : "2017-11-26",
		"branch_name" : "Grasskamp Branch",
	},
	. . .
]
```

```
Successfully imported Employee - Milty Dyett.
Successfully imported Employee - Ermentrude Crenshaw.
. . .
```

Clients (clients.json)

clients.json

```
[
	{
		"first_name" : "Adorne",
		"last_name" : "Bewly",
		"age" : 34,
		"appointed_employee" : "Milty Dyett"
	},
	. . .
]
```

```
Successfully imported Client - Adorne Bewly.
. . .
```

XML Import

The **ccb** have prepared some XML data for you to import too. Don't worry, it's not too much.

Bank Accounts (bank-accounts.xml)

bank-accounts.xml

```
<?xml version="1.0" encoding="utf-8"?>
<bank-accounts>
    <bank-account client="Elyn Grimditch">
        <account-number>84999053-X</account-number>
        <balance>439216.96</balance>
    </bank-account>
    ...
</bank-accounts>
```

```
Successfully imported Bank Account - 84999053-X.
. . .
```

Cards (cards.xml)

cards.xml

```
<?xml version="1.0" encoding="utf-8"?>
<cards>
    <card status="Active" account-number="45313950-8">
        <card-number>CR31 2172 7000 5807</card-number>
    </card>
    <card status="Active" account-number="45313950-8">
        <card-number>KZ69 306U DAMP BELG</card-number>
    </card>
    <card status="Active" account-number="90687224-1">
        <card-number>MR58 1652 6071 3846</card-number>
    </card>
    ...
</cards>
```

```
Successfully imported Card - CR31 2172 7000 5807.
```

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```
. . .
```

5. Data Export

Get ready to export the data you've imported in the previous task. Here you will have some pretty complex database querying. Export the data in the formats specified below.

Top Employees

Export all employees which have **any clients** in them:

- Extract from the database, the **`employees`** and their **`clients`**.
- **Order** them **descending** by **`count of clients`**, and **ascending** by **`employee id`**.

Family Guy

Export the **client** with the **most cards** in his **bank account**.

- Export the **client's full name**, **age, bank_account** and his **cards**.
- For **each** of his **cards**, **export** the **card_number** and the **status**.

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