



UNIVERSITY OF  
**TORONTO**

**ECE 1779: Introduction to Cloud Computing**  
**Project 2: Amazon Lambda**

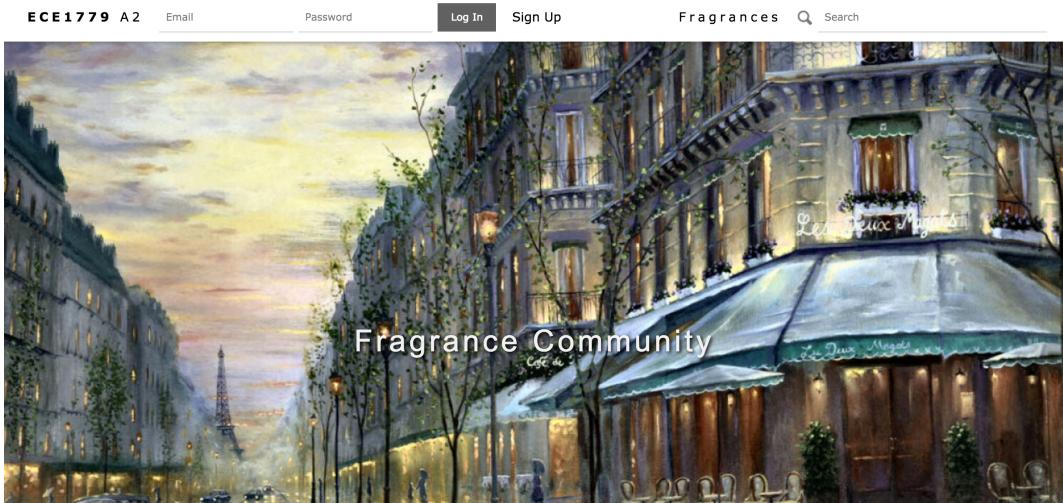
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# 1 Description of the general architecture:

Our application is called Fragrance Community. It is basically designed to provide perfume lovers with comprehensive and reliable fragrance information. For our application, we mainly used Amazon technologies Lambda, API Gateway and S3. Another important technology we used is the Amazon DynamoDB. We created two tables for our application, one for the user data and another for fragrance information.

Our website can be accessed by clicking the link below:

<https://ke3wnd1igh.execute-api.us-east-1.amazonaws.com/dev>



## 1.1 Welcome Page

The welcome page of our application mainly includes three sections. The first section shows the five top rated perfumes. We can see that there is a rating figure under each perfume, and all these scores come from the users of our application.

Top Rated

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 La Fille de Berlin by Serge Lutens 4.5 ★	 Miracle by Lancôme 4.5 ★	 COCO MADEMOISELLE by Chanel 3.5 ★	 Un Jardin en Méditerranée by Hermès 3 ★	 The one by D&G 2.5 ★
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The second section lists the top five perfumes that have been added to favorites list by the users. From this section we can know how many people like a particular type of perfume.

## Top Favorites



**The one**  
by D&G  
**4 user favors**



**La Fille de Berlin**  
by Serge Lutens  
**3 user favors**



**Miracle**  
by Lancome  
**3 user favors**



**COCO  
MADEMOISELLE**  
by Chanel  
**1 user favors**



**Un Jardin en  
Mediterranée**  
by Hermès  
**1 user favors**

The third section shows the top five perfumes that get most reviews.

## Most Reviews



**La Fille de Berlin**  
by Serge Lutens  
**30 user reviews**



**The one**  
by D&G  
**22 user reviews**



**Miracle**  
by Lancome  
**14 user reviews**



**Un Jardin en  
Mediterranée**  
by Hermès  
**13 user reviews**



**COCO  
MADEMOISELLE**  
by Chanel  
**9 user reviews**

## 1.2 Information Pages

If we click the picture of a particular perfume, we will then be led to the detailed information page. This page shows all the information of the perfume including the name, brand and a brief description. Some more detailed information will also be shown on this page including family classification, top note, heart note, base note, flavorist and style. We can see the rating of this perfume by the users as well.

[La Fille de Berlin](#) by Serge Lutens 30 reviews



She's a rose with thorns, don't mess with her. She's a girl who goes to extremes. When she can, she soothes; and when she wants... Her fragrance lifts you higher. She rocks and shocks.

**Family:** Oriental Floral

**Top Note:** Rose Geranium

**Heart Note:** Palmarosa

**Base Note:** Patchouli Oakmoss Honey

**Flavorist:** Christopher Sheldrake

**Style:** Rose Edgy Feminine Audacious

**Rating:** 4.5 2 users rated



[Add To Favorites](#) (3 users favor)

If we click the “Fragrances” button at the top, all the fragrances in our database will be shown. However,

since the database was created by ourselves, it is very small for now and only has limited data. Similarly, we can click the picture of a particular perfume to see detailed information.

ECE 1779 A2 Email Password Log In Sign Up Fragrances Search

Fragrances

sorted by Name

COCO MADEMOISELLE by Chanel

Eau De Parfum by Chloe

Eau des Merveilles by Hermes

La Fille de Berlin by Serge Lutens

Miracle by Lancome

### 1.3 Search Function

Users can also type in whatever keyword in the search bar to find the perfumes that they are interested in. For example, if a user types in family information “Oriental Floral” in the search bar, all the fragrances related with “Oriental Floral” will be shown. By default, the fragrances are sorted in the order of correlation.

Search:oriental floral 9 results sorted by Correlation



**La Fille de Berlin** by Serge Lutens

Family: Oriental Floral Rating: 4.5 ★

Top Note: Rose Geranium 3 Users Favor

Heart Note: Palmarosa 31 User Reviews

Base Note: Patchouli Oakmoss Honey

Flavorist: Christopher Sheldrake

Style: Rose Edgy Feminine Audacious



The one by D&G

Users can also choose to sort them by Rating, Favors, Reviews, Brand and Name.

Search:oriental floral 9 results sorted by Correlation

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<a href="#">Rating</a>
<a href="#">Favors</a>
<a href="#">Reviews</a>
<a href="#">Brand</a>
<a href="#">Name</a>



**La Fille de Berlin** by Serge Lutens

Family: Oriental Floral Rating: 4.5 ★

Top Note: Rose Geranium 3 Users Favor

Heart Note: Palmarosa 31 User Reviews

Base Note: Patchouli Oakmoss Honey

Flavorist: Christopher Sheldrake

Style: Rose Edgy Feminine Audacious

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**The one** by D&G

On this page, we can see that fragrances with the family label “Oriental Floral” will be shown at the top of the list. However, other fragrances with labels such as “Floral” or “Floral Aquatic” will also appear on this page. Therefore, if users want to search for the exact oriental floral perfumes, they can click the “Oriental Floral” tag to filter out the precise results.

Search:oriental floral 3 results sorted by Correlation

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**La Fille de Berlin** by Serge Lutens

Family: Oriental Floral Rating: 4.5 ★

Top Note: Rose Geranium 3 Users Favor

Heart Note: Palmarosa 31 User Reviews

Base Note: Patchouli Oakmoss Honey

Flavorist: Christopher Sheldrake

Style: Rose Edgy Feminine Audacious

## 1.4 Sign up and verify account

Apart from the search function, users of our application are also allowed to register using their email address and a password of their choice. It is worth mentioning that we used Amazon Simple Email Service (SES) in our register part, which means that once an email address has been entered by the new user, a confirmation email will be sent to the registered email address for verification.

### Sign UP

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## Sign UP

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To complete the registration, check your emails.

You'll get an email with a link to comfirm that the address is yours.

Once the user clicks the link in the confirmation email, the account will be activated successfully.

**Hi Yiren Shen !**

Welcome to the [Fragrance Community](#).

**Verify Your Account**

To complete your registration, please verify your email address by clicking this [Link](#).

Alternatively, you can copy and paste the following link into your browser's address window:

[https://ke3wnd1igh.execute-api.us-east-1.amazonaws.com/dev/sign\\_up/verify/yiren0616@gmail.com&863b708e3d010c8ecbdd8c21f8bde726](https://ke3wnd1igh.execute-api.us-east-1.amazonaws.com/dev/sign_up/verify/yiren0616@gmail.com&863b708e3d010c8ecbdd8c21f8bde726)

## Sign UP

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**Congratulations!**

**Your account has been successfully created!**

**Please login with your email and have fun!**

### 1.5 Rating and favorite list

After logging in, users are allowed to rate a particular perfume on a scale of 1 to 5 stars. They can also save fragrances that they are interested in to their own favorites list so that they can check the information of their favorite perfumes conveniently if they want to buy them in the future.

**Rating: 4** 1 users rated and you rated 4 stars



**Add To Favorites** (0 users favor)

When we return to the main page, we can see that an additional section name “My Favorites” has been created for the users. If the users click the “view all” button, they can see all the fragrances that they have saved before.



Miracle



La Fille de Berlin



Eau De Parfum



Eau des Merveilles

by Lancome

by Serge Lutens

by Chloe

by Hermes

## 2 Main technologies

In our application, the main AWS technologies used are listed as follows:

- Amazon Lambda:

AWS Lambda allows us to run code without provisioning or managing servers. Our backend logic is implemented using Lambda functions.

- zappa:

With Zappa, each request is given its own virtual HTTP "server" by Amazon API Gateway. AWS handles the horizontal scaling automatically, so no requests ever time out. After our app returns, the "server" dies.

- API Gateway:

Amazon API Gateway can be integrated with Lambda and acts as a "front door" for functionality from our back-end services.

- DynamoDB:

We create two tables in DynamoDB which are fragrance table and users table to store the information of fragrance and users separately.

- Amazon simple email service:

We employed Amazon SES and boto3 api to send verification email to users in order to activate their accounts.

- S3:

In our application, all the images of fragrances are stored on S3.

- S3 bucket name: fragrance1779

### 2.1 DynamoDB

We used boto3 API to read and write data such as the information of fragrances and users from the dynamo db.

- **Fragrance table:**  
partition key: brand  
sort key: name  
attributes: brand, name, favors, key(store image url), rating, reviews(number of reviews)

- **Users table:**  
primary key: account  
attributes: account, favor(the information of fragrance user added to favourite list), name, password, active(check the account status), code, rated(the brand, name of the fragrance and the rating)

## 2.2 Image Display

We stored all the fragrance images in S3. Then we stored the link as key in the fragrance table in DynamoDB. If we want to get the link of the image from DynamoDB, we only need to know the brand and name of the fragrance and then use boto3 API to extract the link. After putting the link in the “src” property in `<img>` tag, the corresponding image will be shown on the webpage.

## 2.3 Implementation of Search Function

We first extracted all items from DynamoDB. Then we checked if the value of the items includes the keyword the user typed in. If the value of that item does not include the keyword, then the item will be removed. The remaining ones are those that contain the keyword.

If we click the tag of a fragrance within the filtered results, it will trigger the jQuery function and we can get the string that we clicked. In addition, we defined an attribute key in the jQuery function to mark the information of the item. Then the key and the keyword that user entered before will be posted to the backend, finally we can get the items which contain the tag we clicked.

## 2.4 Implementation of Sort Function

We get the filtered items according to the keyword the users entered after searching. If we change the way of sorting, it will trigger the corresponding jQuery function and submit the form, which means to post the value of option to backend. Then the sort function in backend will return the sorted items according to the way of sorting the user has selected.

## 2.5 User Verification

We employed the Amazon Simple Email Service (SES) and boto3 API to send a verification email which includes a link for the users. The mailbox we set in SES plays the role of sending verification email to the users.

The user will receive the verification email after they have filled the register information and clicked the sign up button. The link in the email includes two parameters which are account and code, and the code is encoded by md5. Once the user clicked the link in the verification email, two parameters will be posted to back end and check if they are matched with the information stored in DynamoDB. If matched, the attribute of active in users table will become ‘True’, which means the user account has been activated.

## 2.6 Implementation of Login Function

Once the user submits the form with user name and password, those information will be sent to the backend for matching. If they are matched with the information stored in the database, the user will get authority for that account the user claimed for.

## 2.7 Implementation of the Rating Function

We employed the star rating jQuery plugin. Once the user rates the fragrance, the score will be posted to backend. Then the previous average rating will be extracted from the DynamoDB and the new average rating will be calculated in backend and then be sent to the front end.