

# Online Restaurant Booking Platform

## Table of Contents

<b>A. Requirements Document.....</b>	<b>2</b>
Project Description.....	2
Business Rules.....	2
<b>B. UML Class Diagram.....</b>	<b>3</b>
<b>C. ERD.....</b>	<b>4</b>
<b>D. Definition of Relational Schema with BCNF Proof.....</b>	<b>5</b>
Functional Dependencies:.....	5
BCNF Conditions:.....	5
<b>E. Create &amp; Populate SQL Database.....</b>	<b>6</b>
Create Tables (see create_table.sql).....	6
Populate Database(see populate_database.sql, generate_data.py).....	7
Query 1: Join of at least three tables.....	8
Query 2: Subquery.....	8
Query 3: Group By with a Having Clause.....	9
Query 4: Complex search criterion.....	9
Query 5: Experiment with Advanced Query Mechanisms:.....	10
<b>F. Application Demo(See folder for source code: 8.Application).....</b>	<b>10</b>
How to run the app.....	10
Default Page.....	11
List all Restaurant.....	11
Delete Restaurant.....	12
Update Restaurant.....	12
Add new restaurant.....	13

## A. Requirements Document

### Project Description

The online restaurant booking platform will allow customers to search, view information, and make reservations at restaurants. Customers can filter restaurants by location, cuisine, budget, etc. and view restaurant details including menu, reviews, location. Customers can create accounts to make and manage reservations online.

The system will also allow restaurant owners/staff to manage their business information and availability. They can add menu items, update hours of operation, view and respond to customer reviews, and monitor upcoming reservations.

### Business Rules

- Customers must create an account to make reservations
- Reservations require date, time, party size, and contact information
- Customers can write one review per restaurant
- Reviews require rating (1-5 stars) and optional comment
- Restaurants can add/update menu items with name, description, price
- Menu items can be categorized by cuisine type
- Restaurants set available reservation times/dates

#### **Nouns:**

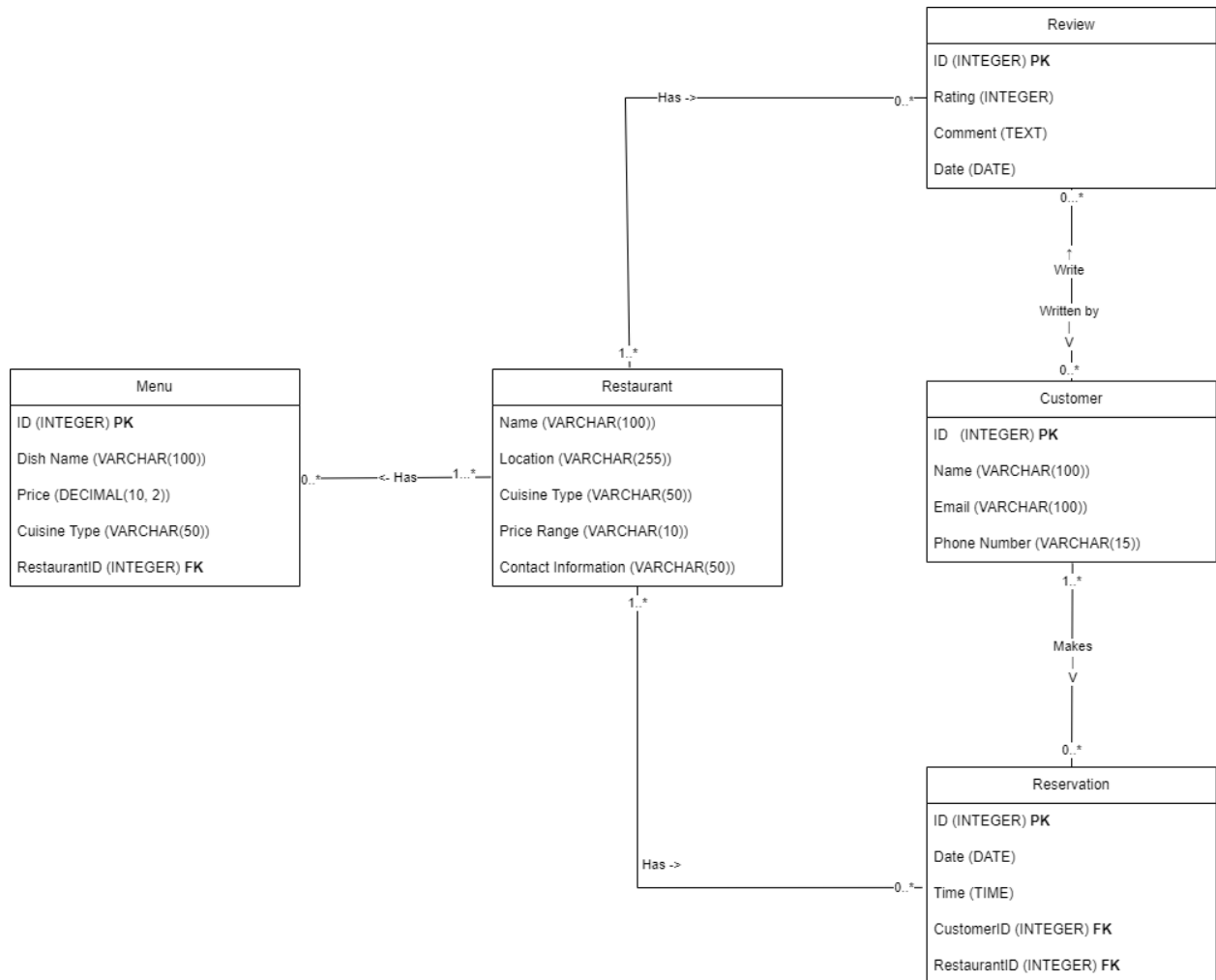
Customer, Restaurant, Reservation, Review, Menu, Menu Item, Account

#### **Verbs:**

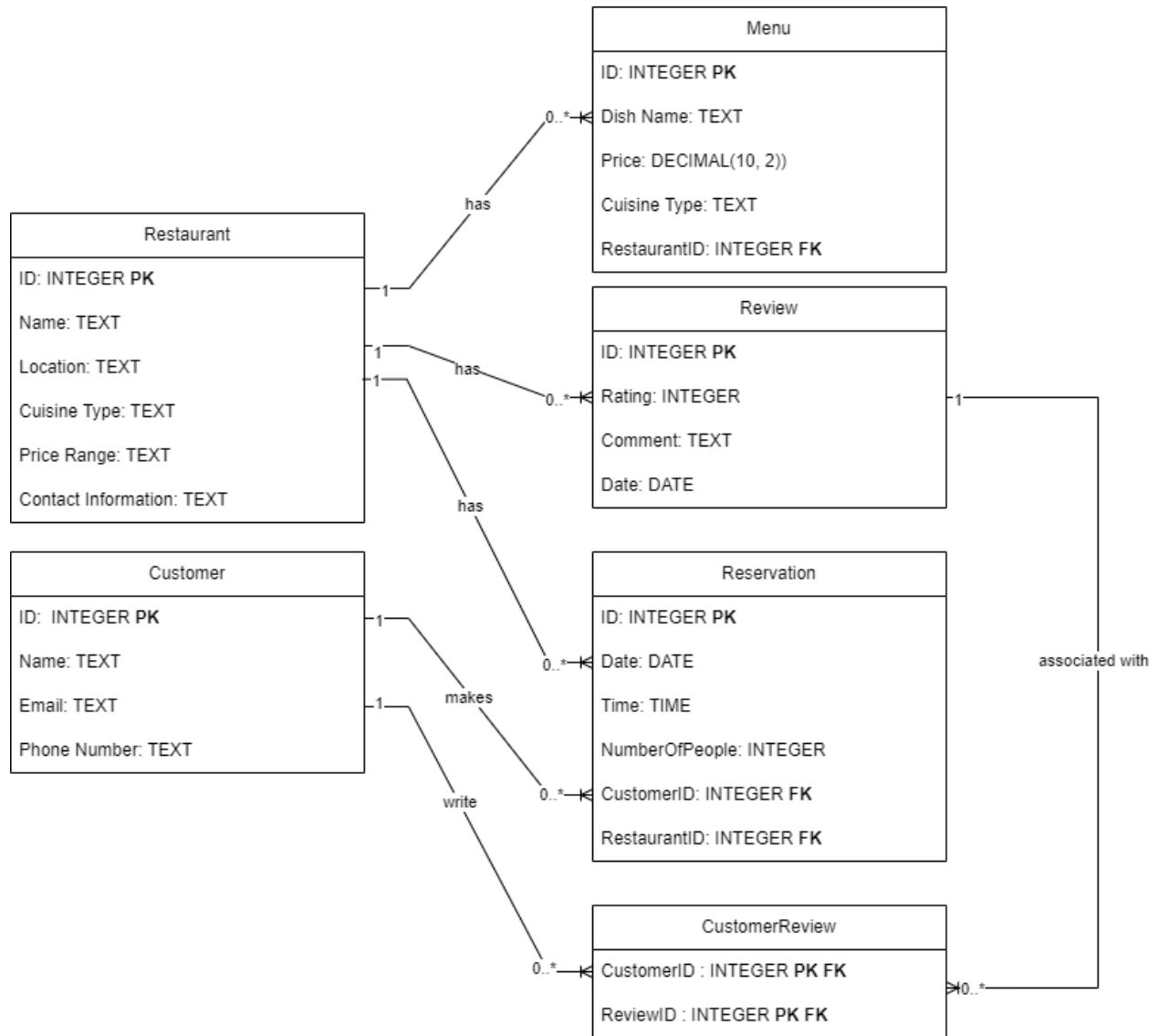
Search, View, Filter, Create, Make, Manage, Add, Update, Monitor, Set

This covers a high-level description of the online restaurant booking platform, key business rules, and identifies some initial nouns and verbs that will inform the data model. Let me know if you would like me to expand or modify this draft task 1 document in any way.

## B. UML Class Diagram



## C. ERD



## D. Definition of Relational Schema with BCNF Proof

### Functional Dependencies:

- **Restaurant:**  $ID \rightarrow Name, Location, CuisineType, PriceRange, ContactInfo$
- **Customer:**  $ID \rightarrow Name, Email, PhoneNumber$
- **Reservation:**  $ID \rightarrow Date, Time, NumberOfPeople, CustomerID, RestaurantID$
- **Review:**  $ID \rightarrow Rating, Comment, Date$
- **Menu:**  $ID \rightarrow DishName, Price, CuisineType, RestaurantID$
- **CustomerReview:**  $CustomerID, ReviewID \rightarrow \emptyset$  (This table is to resolve the many-to-many relationship, so there are no non-key attributes.)

### BCNF Conditions:

A table is in BCNF if for every non-trivial functional dependency  $X \rightarrow Y$ ,  $X$  is a superkey.

### Verification:

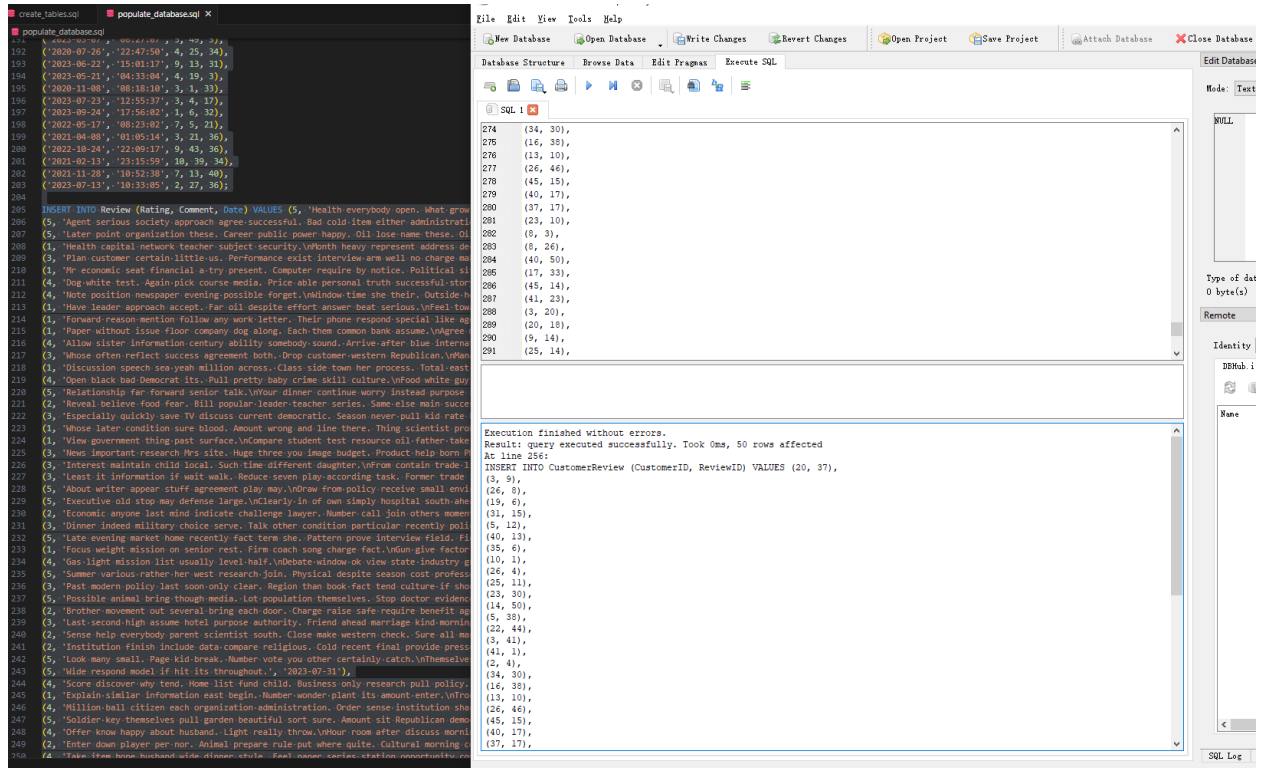
- **Restaurant:** The determinant is the primary key, so it satisfies BCNF.
- **Customer:** The determinant is the primary key, so it satisfies BCNF.
- **Reservation:** The determinant is the primary key, so it satisfies BCNF.
- **Review:** The determinant is the primary key, so it satisfies BCNF.
- **Menu:** The determinant is the primary key, so it satisfies BCNF.
- **CustomerReview:** This table is used to resolve the many-to-many relationship and only contains foreign keys, so it satisfies BCNF.

Since all tables satisfy the BCNF conditions, the schema is in BCNF.

## Create Tables (see `create_table.sql`)



# Populate Database(see `populate_database.sql`, `generate_data.py`)



## Query 1: Join of at least three tables

Join the Reservation, Customer, and Restaurant tables to get a list of reservations, including customer names and restaurant details.(see queries.sql)

```
1 SELECT r.ID as ReservationID, c.Name as CustomerName, res.Name as RestaurantName, res.Location as RestaurantLocation
2 FROM Reservation r
3 JOIN Customer c ON r.CustomerID = c.ID
4 JOIN Restaurant res ON r.RestaurantID = res.ID
```

	ReservationID	CustomerName	RestaurantName	RestaurantLocation
1	1	Alexandra Jones	Taylor-Lopez	2989 Brian Inlet Apt. 846, Danachester, CO 08758
2	2	Elizabeth Cervantes	Smith, Alexander and Duncan	60227 Katherine Points Suite 796, East Sean, ...
3	3	Brandon Jenkins	Harris Ltd	6012 Timothy Ferry Suite 279, Mitchellside, TN ...
4	4	John Martin	Edwards-Burton	216 Pierce Center, East Matthewberg, CO 78907
5	5	Kimberly Bowers	Johnson Ltd	51074 Heather Bridge, Herrerachester, DE 50498
6	6	Theresa Robinson	Gonzalez LLC	0499 Patrick Trafficway, Shannonmouth, MP ...
7	7	Joshua Cohen	Coleman and Sons	Unit 4229 Box 1774, DPO AE 58353
8	8	Victoria Klein	Martin, Robinson and Henderson	8671 Tina Heights Suite 683, New Heatherfurt, ...
9	9	Joshua Cohen	Nguyen-Villegas	876 Nicole Shoal Suite 684, West Brian, WI 40492
10	10	Theresa Robinson	Nguyen-Villegas	876 Nicole Shoal Suite 684, West Brian, WI 40492
11	11	Christopher Gibbs	Turner Ltd	5881 Matthew Lake Suite 828, South ...

Execution finished without errors.  
Result: 50 rows returned in 4ms  
At line 1:  
SELECT r.ID as ReservationID, c.Name as CustomerName, res.Name as RestaurantName, res.Location as RestaurantLocation  
FROM Reservation r  
JOIN Customer c ON r.CustomerID = c.ID  
JOIN Restaurant res ON r.RestaurantID = res.ID

## Query 2: Subquery

Find all restaurants that have received a review with a rating of 5 (see queries.sql)

```
1 SELECT DISTINCT r.Name as RestaurantName, r.Location as RestaurantLocation
2 FROM Restaurant r
3 WHERE EXISTS (
4     SELECT 1
5     FROM Menu m
6     JOIN CustomerReview cr ON m.RestaurantID = cr.CustomerID
7     JOIN Review rev ON cr.ReviewID = rev.ID
8     WHERE m.RestaurantID = r.ID AND rev.Rating = 5
9 )
```

	RestaurantName	RestaurantLocation
1	Bailey and Sons	72748 Clark Avenue Apt. 666, Davisshire, NE ...
2	Anderson Ltd	41595 Nicholson Viaduct, Marktown, VA 09589
3	Coleman and Sons	Unit 4229 Box 1774, DPO AE 58353
4	Smith, Alexander and Duncan	60227 Katherine Points Suite 796, East Sean, ...
5	Morris, Miller and Sellers	650 Kurt Mountain Suite 495, Lake Theresatown...
6	Kelly, Wolf and Schmidt	29863 Heather Curve Suite 665, East ...

Execution finished without errors.  
Result: 6 rows returned in 4ms  
At line 1:  
SELECT DISTINCT r.Name as RestaurantName, r.Location as RestaurantLocation  
FROM Restaurant r  
WHERE EXISTS (  
 SELECT 1  
 FROM Menu m  
 JOIN CustomerReview cr ON m.RestaurantID = cr.CustomerID  
 JOIN Review rev ON cr.ReviewID = rev.ID  
 WHERE m.RestaurantID = r.ID AND rev.Rating = 5  
)



### Query 3: Group By with a Having Clause

Group the reviews by restaurant and find the restaurants that have an average rating higher than 4.(see queries.sql)

```
1 SELECT r.Name as RestaurantName, AVG(rev.Rating) as AverageRating
2 FROM Restaurant r
3 JOIN Menu m ON r.ID = m.RestaurantID
4 JOIN CustomerReview cr ON m.RestaurantID = cr.CustomerID
5 JOIN Review rev ON cr.ReviewID = rev.ID
6 GROUP BY r.ID
7 HAVING AVG(rev.Rating) > 4;
```

	RestaurantName	AverageRating
1	Bailey and Sons	4.5
2	Anderson Ltd	5.0
3	Coleman and Sons	5.0

Execution finished without errors.

Result: 3 rows returned in 3ms

At line 1:

```
SELECT r.Name as RestaurantName, AVG(rev.Rating) as AverageRating
FROM Restaurant r
JOIN Menu m ON r.ID = m.RestaurantID
JOIN CustomerReview cr ON m.RestaurantID = cr.CustomerID
JOIN Review rev ON cr.ReviewID = rev.ID
GROUP BY r.ID
HAVING AVG(rev.Rating) > 4;
```

### Query 4: Complex search criterion

Find all customers who have made a reservation for more than 3 people at an American restaurant. (see queries.sql)

```
1 SELECT c.Name as CustomerName, r.Name as RestaurantName, res.NumberOfPeople, r.Location as RestaurantLocation
2 FROM Customer c
3 JOIN Reservation res ON c.ID = res.CustomerID
4 JOIN Restaurant r ON res.RestaurantID = r.ID
5 WHERE res.NumberOfPeople > 3 AND r.CuisineType = 'American';
```

	CustomerName	RestaurantName	NumberOfPeople	RestaurantLocation
1	Theresa Robinson	Gonzalez LLC	5	0499 Patrick Trafficway, Shannonmouth, MP ...
2	Amanda Gordon	Schneider, Copeland and Herman	9	800 Ross Grove, West Christinaside, LA 95131
3	Lisa Price	Kelly, Wolf and Schmidt	4	29863 Heather Curve Suite 665, East ...
4	Erica Johnson	Bartlett Inc	8	2033 Shannon Heights, Wandaside, AS 01750
5	Alice Torres	Gonzalez LLC	5	0499 Patrick Trafficway, Shannonmouth, MP ...

Execution finished without errors.

Result: 7 rows returned in 4ms

At line 1:

```
SELECT c.Name as CustomerName, r.Name as RestaurantName, res.NumberOfPeople, r.Location as RestaurantLocation
FROM Customer c
JOIN Reservation res ON c.ID = res.CustomerID
JOIN Restaurant r ON res.RestaurantID = r.ID
WHERE res.NumberOfPeople > 3 AND r.CuisineType = 'American';
```

## Query 5: Experiment with Advanced Query Mechanisms:

Use PARTITION BY to rank restaurants within each cuisine type based on their average review rating.(see queries.sql)

```
1 SELECT r.Name as RestaurantName, r.CuisineType, AVG(rev.Rating) as AverageRating,
2     RANK() OVER(PARTITION BY r.CuisineType ORDER BY AVG(rev.Rating) DESC) as CuisineTypeRank
3 FROM Restaurant r
4 JOIN Menu m ON r.ID = m.RestaurantID
5 JOIN CustomerReview cr ON m.RestaurantID = cr.CustomerID
6 JOIN Review rev ON cr.ReviewID = rev.ID
7 GROUP BY r.ID, r.CuisineType;
```

	RestaurantName	CuisineType	AverageRating	CuisineTypeRank
1	Kelly, Wolf and Schmidt	American	3.66666666666667	1
2	Miles Group	American	2.5	2
3	Taylor-Lopez	American	1.0	3
4	Anderson Ltd	Chinese	5.0	1
5	Coleman and Sons	Chinese	5.0	1

Execution finished without errors.

Result: 17 rows returned in 6ms

At line 1:

```
SELECT r.Name as RestaurantName, r.CuisineType, AVG(rev.Rating) as AverageRating,
      RANK() OVER(PARTITION BY r.CuisineType ORDER BY AVG(rev.Rating) DESC) as CuisineTypeRank
FROM Restaurant r
JOIN Menu m ON r.ID = m.RestaurantID
JOIN CustomerReview cr ON m.RestaurantID = cr.CustomerID
JOIN Review rev ON cr.ReviewID = rev.ID
GROUP BY r.ID, r.CuisineType;
```

## F. Application Demo(See folder for source code: 8.Application)

### How to run the app

1. Enter the following command in the terminal:

```
cd 8.Application
```

```
node app.js
```

2. Open <http://localhost:3000> in your browser.

Default Page

← → ↻ ⓘ localhost:3000

# Welcome to the Restaurant Review App

[View Restaurants](#)

[Add a Restaurant](#)

[View Reviews](#)

List all Restaurant

Click View Restaurants, the following page will show up:

← → ↻ ⓘ localhost:3000/restaurants

## Restaurants

- Gonzalez LLC - 0499 Patrick Trafficway, Shannonmouth, MP 24102 [Update](#) [Delete](#)
- Lee Ltd - Unit 5196 Box 3034, DPO AP 65654 [Update](#) [Delete](#)
- Taylor-Lopez - 2989 Brian Inlet Apt. 846, Danachester, CO 08758 [Update](#) [Delete](#)
- Hernandez-Wilson - 93638 Daniel Place, East Crystal, AS 91084 [Update](#) [Delete](#)
- Bailey and Sons - 72748 Clark Avenue Apt. 666, Davisshire, NE 11106 [Update](#) [Delete](#)
- Brown-Calderon - USNV Haynes, FPO AP 01089 [Update](#) [Delete](#)
- Brown, Lynch and Edwards - 921 Taylor Locks, Keithchester, AK 80807 [Update](#) [Delete](#)
- Harris Ltd - 6012 Timothy Ferry Suite 279, Mitchellside, TN 06844 [Update](#) [Delete](#)
- Roberts Inc - 213 Perry Spur Suite 885, Sandrashire, NV 78987 [Update](#) [Delete](#)
- Anderson Ltd - 41595 Nicholson Viaduct, Marktown, VA 09589 [Update](#) [Delete](#)
- Larson Group - USNV Berger, FPO AE 88103 [Update](#) [Delete](#)
- Nguyen-Villegas - 876 Nicole Shoal Suite 684, West Brian, WI 40492 [Update](#) [Delete](#)
- Carroll Inc - 427 Diana Vista, North Dianestad, PW 17860 [Update](#) [Delete](#)
- Morris, Boyer and Brennan - 4094 Bell Mission Suite 995, Gonzalezberg, MS 73599 [Update](#) [Delete](#)
- Rivera-Rhodes - 3224 Zachary Islands Suite 187, Parkerport, MS 87198 [Update](#) [Delete](#)
- Coleman and Sons - Unit 4229 Box 1774, DPO AE 58353 [Update](#) [Delete](#)
- Smith, Alexander and Duncan - 60227 Katherine Points Suite 796, East Sean, WI 10776 [Update](#) [Delete](#)
- Tran, Mack and Allison - 44169 David Club Suite 603, Shawmouth, NH 67482 [Update](#) [Delete](#)
- Simpson Inc - 44374 Sarah Passage, Lisaview, UT 52447 [Update](#) [Delete](#)
- Waters-Bennett - 012 Sydney Underpass Suite 222, East Eric, WI 46870 [Update](#) [Delete](#)
- Edwards-Burton - 216 Pierce Center, East Matthewberg, CO 78907 [Update](#) [Delete](#)
- Ross-Smith - 2474 Theodore Fields Suite 170, Willisberg, NM 29549 [Update](#) [Delete](#)
- Miles Group - 040 Kristine Square Apt. 658, Villamouth, OH 27266 [Update](#) [Delete](#)
- Chen Group - 319 Jacob Springs Apt. 018, Jasonbury, PR 73975 [Update](#) [Delete](#)
- Hatfield, Church and Jimenez - 371 Douglas Lights Suite 527, East Jane, NJ 45851 [Update](#) [Delete](#)
- Johnson Ltd - 51074 Heather Bridge, Herrerachester, DE 50498 [Update](#) [Delete](#)
- Newton-Johnston - 909 Davis Parkway, Katherinestad, WY 62752 [Update](#) [Delete](#)
- Hansen-Carroll - 969 Wayne Park, South Rodney, SC 38205 [Update](#) [Delete](#)
- Thompson-Chavez - 532 Luna Stream, Wongfort, OK 28227 [Update](#) [Delete](#)

## Delete Restaurant

Click “Delete” next to the restaurant you want to remove, the page will refresh with a new list of restaurants.

### Restaurants

Before Delete

- Gonzalez LLC - 0499 Patrick Trafficway, Shannonmouth, MP 24102 [Update](#) [Delete](#)
- Lee Ltd - Unit 5196 Box 3034, DPO AP 65654 [Update](#) [Delete](#)
- Taylor-Lopez - 2989 Brian Inlet Apt. 846, Danachester, CO 08758 [Update](#) [Delete](#)
- Hernandez-Wilson - 93638 Daniel Place, East Crystal, AS 91084 [Update](#) [Delete](#)
- Bailey and Sons - 72748 Clark Avenue Apt. 666, Davisshire, NE 11106 [Update](#) [Delete](#)
- Brown-Calderon - USNV Haynes, FPO AP 01089 [Update](#) [Delete](#)
- Brown, Lynch and Edwards - 921 Taylor Locks, Keithchester, AK 80807 [Update](#) [Delete](#)
- Harris Ltd - 6012 Timothy Ferry Suite 279, Mitchellside, TN 06844 [Update](#) [Delete](#)

### Restaurants

After Delete

- Lee Ltd - Unit 5196 Box 3034, DPO AP 65654 [Update](#) [Delete](#)
- Taylor-Lopez - 2989 Brian Inlet Apt. 846, Danachester, CO 08758 [Update](#) [Delete](#)
- Hernandez-Wilson - 93638 Daniel Place, East Crystal, AS 91084 [Update](#) [Delete](#)
- Bailey and Sons - 72748 Clark Avenue Apt. 666, Davisshire, NE 11106 [Update](#) [Delete](#)
- Brown-Calderon - USNV Haynes, FPO AP 01089 [Update](#) [Delete](#)
- Brown, Lynch and Edwards - 921 Taylor Locks, Keithchester, AK 80807 [Update](#) [Delete](#)
- Harris Ltd - 6012 Timothy Ferry Suite 279, Mitchellside, TN 06844 [Update](#) [Delete](#)
- Roberts Inc - 213 Perrv Sour Suite 885. Sandrashire. NV 78987 [Update](#) [Delete](#)

## Update Restaurant

Click “Update” next to the restaurant you want to remove, you will be directed to the following page:

← → ↻ ⓘ localhost:3000/update-restaurant/2

## Update Restaurant

Name:

Location:

[Back to Restaurants](#)

Enter the new information and click “Update”, the restaurant information will be updated.

---

## Update Restaurant

Name:   
Location:

[Back to Restaurants](#)

## Restaurants

- Lee Ltd New - Unit 5196 Box 3034, DPO AP 65654 [Update](#) [Delete](#)
- Taylor-Lopez - 2989 Brian Inlet Apt. 846, Danachester, CO 08758 [Update](#) [Delete](#)
- Hernandez-Wilson - 93638 Daniel Place, East Crystal, AS 91084 [Update](#) [Delete](#)
- Bailey and Sons - 72748 Clark Avenue Apt. 666, Davisshire, NE 11106 [Update](#) [Delete](#)
- Brown-Calderon - USNV Haynes, FPO AP 01089 [Update](#) [Delete](#)
- Brown, Lynch and Edwards - 921 Taylor Locks, Keithchester, AK 80807 [Update](#) [Delete](#)
- Harris Ltd - 6012 Timothy Ferry Suite 279, Mitchellside, TN 06844 [Update](#) [Delete](#)

Add new restaurant

At homepage, click “Add a Restaurant”, the following page will appear:

## Add Restaurant

Name:   
Location:   
Cuisine Type:   
Price Range:   
Contact Info:

[Back to Home](#)

After entering the information, click "Add", and the restaurant will appear at the end of the list of restaurants:

- Bartlett Inc - 2033 Shannon Heights, Wandaside, AS 01750 [Update](#) [Delete](#)
- Snyder-Clark - 2193 Petersen Cliff Apt. 946, East Pamelaside, TN 80855 [Update](#) [Delete](#)
- Dunn Ltd - USS Lloyd, FPO AA 56574 [Update](#) [Delete](#)
- New Taste! - Somewhere [Update](#) [Delete](#)

[Back to Home](#)