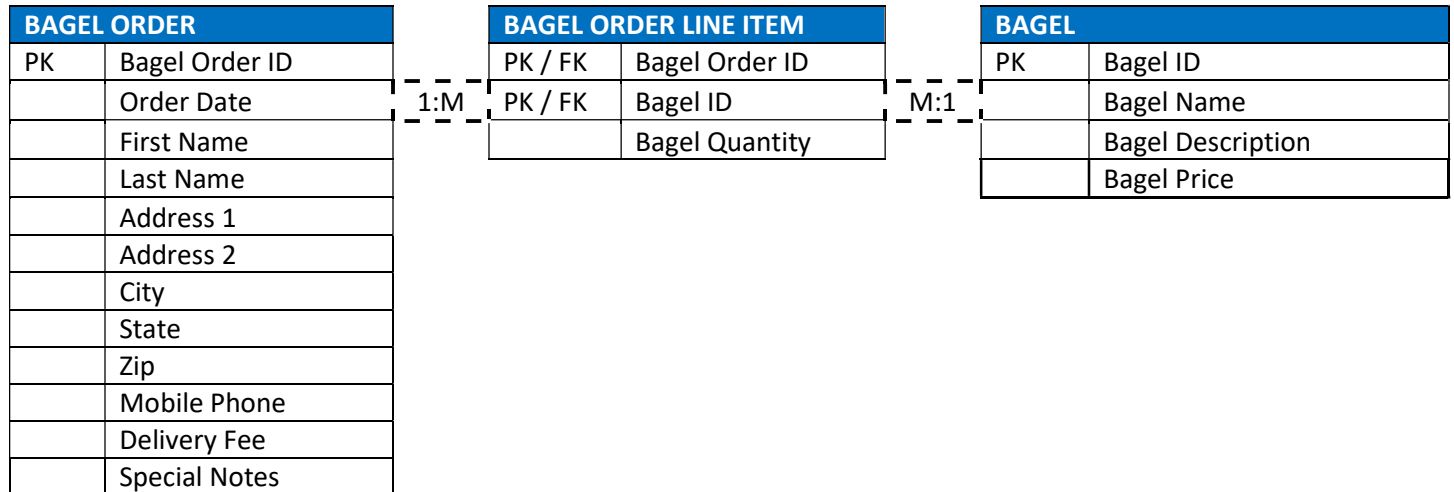


## Part A1

### Nora's Bagel Bin Database Blueprints

#### Second Normal Form (2NF)



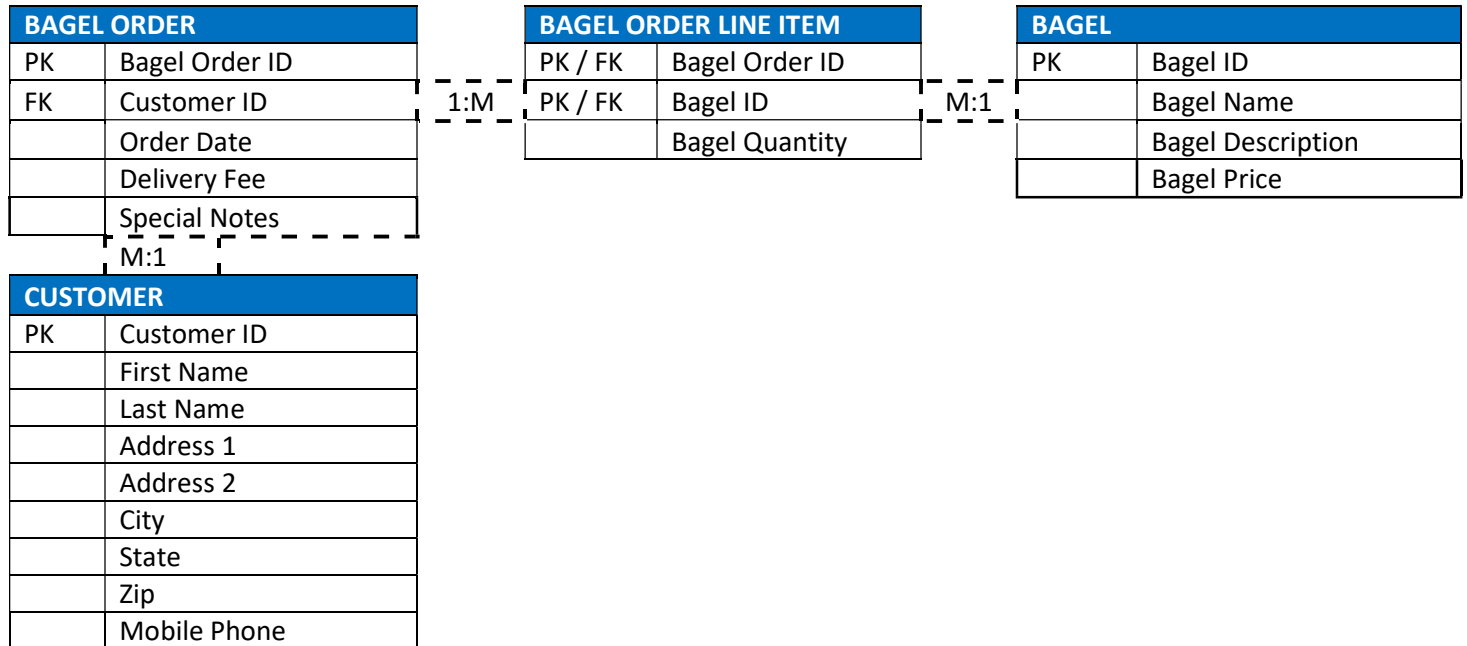
#### Explanation

- **(Attributes)** In second normal form, there is not yet a table for exclusively storing and retrieving customer information. Instead, these attributes are stored as part of the order details within the bagel order table. The bagel order line item table already contained the bagel order id as well as the bagel id, so it only needed the addition of a bagel quantity attribute to be able to communicate the proper information for each bagel order. Lastly, the bagel table needed to be populated with the attributes required for identifying each respective bagel.
- **(Cardinality)** In second normal form, there can only be one bagel order per customer. This is because the customer is not established as a separate entity yet. Instead, the customer details are listed as part of the bagel order. Since the creation of a bagel order also requires the customer to input their information each time, there can semantically only be one bagel order per customer. A single bagel order may contain many bagel order line items, which indicates a one-to-many relationship. While there can be many bagel order line items per bagel order, a bagel order line item is only permitted to refer to one specific type of bagel, which indicates a many-to-one relationship.

## Part A2

### Nora's Bagel Bin Database Blueprints *(continued)*

#### Third Normal Form (3NF)



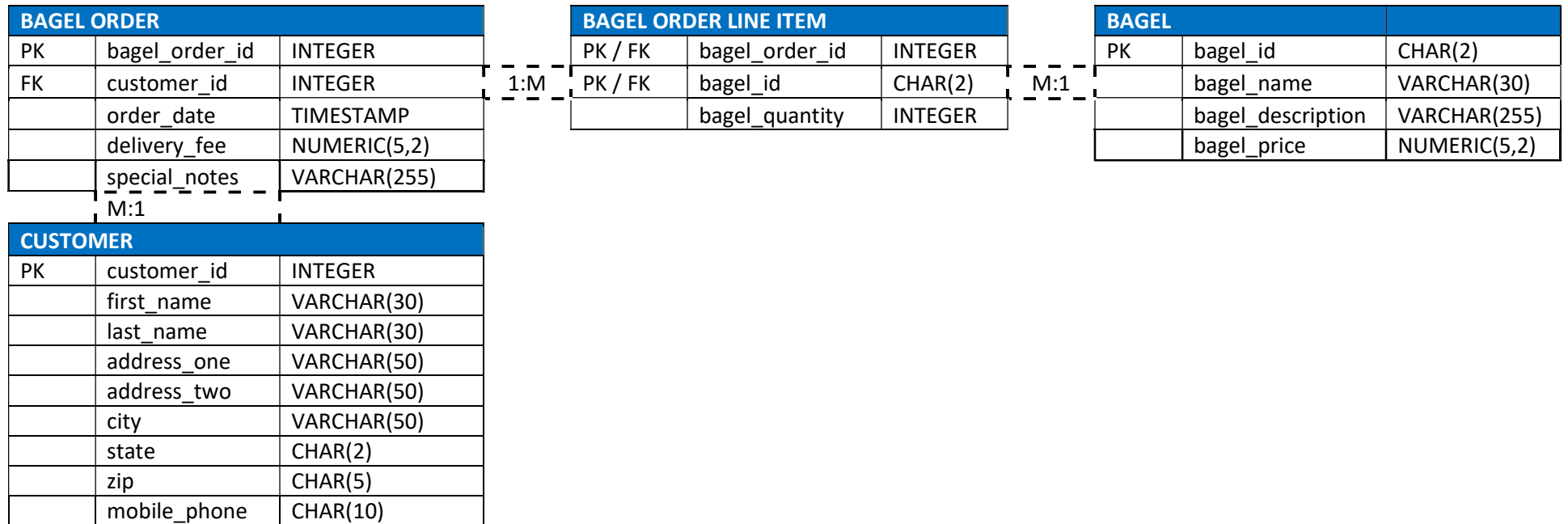
#### Explanation

- **(Attributes)** In third normal form, the customer's information needed to be separated from the bagel order table with the creation of a customer table. This allows customers to place multiple orders without the redundancy of being required to input their information with each order. To achieve this outcome, the customer's information needed to be relocated from the bagel order table to the new customer table. A new customer id primary/foreign key enables proper communication between the customer and bagel order tables.
- **(Cardinality)** By creating a customer table, the inherent one-to-one relationship between the customer and the bagel order has been removed, which allows a customer to place many orders. From top-to-bottom, this creates a many-to-one relationship between bagel orders and the customer. The relationship between bagel orders and bagel order line items remains unchanged at one-to-many, and the relationship between bagel order line items and bagels remains unchanged at many-to-one.

## Part A3

### Nora's Bagel Bin Database Blueprints *(continued)*

#### Final Physical Database Model



#### Explanation

- **(Attributes)** Attributes were modified to adhere to proper naming convention. Each attribute has also been assigned a respective datatype.
- **(Cardinality)** Cardinality remains unchanged from third normal form.

# Part B1

## Jaunty Coffee Co.

### (a) Create All Tables

```
1 • use jaunty_coffee_co;
2
3 • create table coffee_shop
4 (
5     shop_id int,
6     shop_name varchar(50),
7     city varchar(50),
8     state char(2),
9     primary key (shop_id)
10 );
11
12 • create table employee
13 (
14     employee_id int,
15     first_name varchar(30),
16     last_name varchar(30),
17     hire_date date,
18     job_title varchar(30),
19     shop_id int,
20     primary key (employee_id),
21     constraint foreign key (shop_id)
22     references coffee_shop(shop_id)
23 );
24
25 • create table supplier
26 (
27     supplier_id int,
28     company_name varchar(50),
29     country varchar(30),
30     sales_contact_name varchar(60),
31     email varchar(50) not null,
32     primary key (supplier_id)
33 );
34
35 • create table coffee
36 (
37     coffee_id int,
38     shop_id int,
39     supplier_id int,
40     coffee_name varchar(30),
41     price_per_pound numeric(5,2),
42     primary key (coffee_id),
43     constraint foreign key (shop_id)
44     references coffee_shop(shop_id),
45     constraint foreign key (supplier_id)
46     references supplier(supplier_id)
47 );
```

### (b) Output

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	18:21:49	use jaunty_coffee_co	0 row(s) aff...	0.000 sec
2	18:21:49	create table coffee_shop ( shop_id int, shop_name varchar(50), city varchar(50), state char(2), primary key (shop_id) )	0 row(s) aff...	0.047 sec
3	18:21:49	create table employee ( employee_id int, first_name varchar(30), last_name varchar(30), hire_date date, job_title varchar(30), shop_id int, primary key (employee_id), constraint foreign key (shop_id) references coffee_shop(shop_id) )	0 row(s) aff...	0.046 sec
4	18:21:49	create table supplier ( supplier_id int, company_name varchar(50), country varchar(30), sales_contact_name varchar(60), email varchar(50) not null, primary key (supplier_id) )	0 row(s) aff...	0.031 sec
5	18:21:49	create table coffee ( coffee_id int, shop_id int, supplier_id int, coffee_name varchar(30), price_per_pound numeric(5,2), primary key (coffee_id), constraint foreign key (shop_id) references coffee_shop(shop_id), constraint foreign key (supplier_id) references supplier(supplier_id) )	0 row(s) aff...	0.047 sec

## Part B2

### Jaunty Coffee Co. *(continued)*

#### *(a) Populate Tables*

```
1 • use jaunty_coffee_co;
2
3 • insert into employee (employee_id, first_name, last_name, hire_date, job_title, shop_id)
4     values (1, 'john', 'smith', '2020-12-31', 'retail manager', 609);
5 • insert into employee (employee_id, first_name, last_name, hire_date, job_title, shop_id)
6     values (2, 'taylor', 'williams', '2021-01-15', 'commercial manager', 856);
7 • insert into employee (employee_id, first_name, last_name, hire_date, job_title, shop_id)
8     values (3, 'arthur', 'franklin', '2022-07-24', 'hiring manager', 715);
9
10 • insert into coffee_shop (shop_id, shop_name, city, state)
11     values (609, 'jaunty coffee co', 'philadelphia', 'pa');
12 • insert into coffee_shop (shop_id, shop_name, city, state)
13     values (856, 'jaunty coffee co', 'boston', 'ma');
14 • insert into coffee_shop (shop_id, shop_name, city, state)
15     values (715, 'jaunty coffee co', 'chicago', 'il');
16
17 • insert into coffee (coffee_id, shop_id, supplier_id, coffee_name, price_per_pound)
18     values (9422, 609, 1234, 'dark roast', 12.00);
19 • insert into coffee (coffee_id, shop_id, supplier_id, coffee_name, price_per_pound)
20     values (5153, 856, 3579, 'medium roast', 10.00);
21 • insert into coffee (coffee_id, shop_id, supplier_id, coffee_name, price_per_pound)
22     values (3667, 715, 2468, 'light roast', 8.00);
23
24 • insert into supplier (supplier_id, company_name, country, sales_contact_name, email)
25     values (1234, 'coffee haven', 'united states', 'jane doe', 'janedoe@coffeehaven.com');
26 • insert into supplier (supplier_id, company_name, country, sales_contact_name, email)
27     values (3579, 'espresso world', 'united states', 'bob jonathan', 'bobjonathan@espressoworld.com');
28 • insert into supplier (supplier_id, company_name, country, sales_contact_name, email)
29     values (2468, 'beans r us', 'united states', 'jimmy james', 'jimmyjames@beansrus.com');
```

## Part B2

### Jaunty Coffee Co. *(continued)*

#### (b) Results

	employee_id	first_name	last_name	hire_date	job_title	shop_id
▶	1	john	smith	2020-12-31	retail manager	609
	2	taylor	williams	2021-01-15	commercial manager	856
	3	arthur	franklin	2022-07-24	hiring manager	715

	shop_id	shop_name	city	state
▶	609	jaunty coffee co	philadelphia	pa
	715	jaunty coffee co	chicago	il
	856	jaunty coffee co	boston	ma

	coffee_id	shop_id	supplier_id	coffee_name	price_per_pound
▶	3667	715	2468	light roast	8.00
	5153	856	3579	medium roast	10.00
	9422	609	1234	dark roast	12.00

	supplier_id	company_name	country	sales_contact_name	email
▶	1234	coffee haven	united states	jane doe	janedoe@coffeehaven.com
	2468	beans r us	united states	jimmy james	jimmyjames@beansrus.com
	3579	espresso world	united states	bob jonathan	bobjonathan@espressoworld.com

#### (b) Output

Output					
Action Output					
#	Time	Action	Message	Duration / Fetch	
1	19:31:53	use jaunty_coffee_co	0 row(s) affected	0.000 sec	
2	19:31:54	insert into employee (employee_id, first_name, last_name, hire_date, job_title, shop_id) values (1, 'john', 'smith', '2020-12-31', 'retail manager', 609)	1 row(s) affected	0.000 sec	
3	19:31:54	insert into employee (employee_id, first_name, last_name, hire_date, job_title, shop_id) values (2, 'taylor', 'williams', '2021-01-15', 'commercial manager', 856)	1 row(s) affected	0.000 sec	
4	19:31:54	insert into employee (employee_id, first_name, last_name, hire_date, job_title, shop_id) values (3, 'arthur', 'franklin', '2022-07-24', 'hiring manager', 715)	1 row(s) affected	0.000 sec	
5	19:31:54	insert into coffee_shop (shop_id, shop_name, city, state) values (609, 'jaunty coffee co', 'philadelphia', 'pa')	1 row(s) affected	0.015 sec	
6	19:31:54	insert into coffee_shop (shop_id, shop_name, city, state) values (856, 'jaunty coffee co', 'boston', 'ma')	1 row(s) affected	0.016 sec	
7	19:31:54	insert into coffee_shop (shop_id, shop_name, city, state) values (715, 'jaunty coffee co', 'chicago', 'il')	1 row(s) affected	0.000 sec	
8	19:31:54	insert into coffee (coffee_id, shop_id, supplier_id, coffee_name, price_per_pound) values (9422, 609, 1234, 'dark roast', 12.00)	1 row(s) affected	0.016 sec	
9	19:31:55	insert into coffee (coffee_id, shop_id, supplier_id, coffee_name, price_per_pound) values (5153, 856, 3579, 'medium roast', 10.00)	1 row(s) affected	0.000 sec	
10	19:31:55	insert into coffee (coffee_id, shop_id, supplier_id, coffee_name, price_per_pound) values (3667, 715, 2468, 'light roast', 8.00)	1 row(s) affected	0.016 sec	
11	19:31:55	insert into supplier (supplier_id, company_name, country, sales_contact_name, email) values (1234, 'coffee haven', 'united states', 'jane doe', 'janedoe@cof...	1 row(s) affected	0.000 sec	
12	19:31:55	insert into supplier (supplier_id, company_name, country, sales_contact_name, email) values (3579, 'espresso world', 'united states', 'bob jonathan', 'bobjon...	1 row(s) affected	0.000 sec	
13	19:31:55	insert into supplier (supplier_id, company_name, country, sales_contact_name, email) values (2468, 'beans r us', 'united states', 'jimmy james', 'jimmyjames@...	1 row(s) affected	0.016 sec	

# Part B3

## Jaunty Coffee Co. *(continued)*

### (a) Create View

```
1 • use jaunty_coffee_co;
2
3 • create view employeeView as
4     select *,
5         concat (first_name, ' ', last_name) as employee_full_name
6     from employee;
```

### (b) Results

	employee_id	first_name	last_name	hire_date	job_title	shop_id	employee_full_name
▶	1	john	smith	2020-12-31	retail manager	609	john smith
	2	taylor	williams	2021-01-15	commercial manager	856	taylor williams
	3	arthur	franklin	2022-07-24	hiring manager	715	arthur franklin

### (b) Output

Output			
Action Output			
#	Time	Action	Duration / Fetch
✓ 1	19:11:22	use jaunty_coffee_co	0 row(s) affected 0.000 sec
✓ 2	19:11:23	create view employeeView as select *, concat (first_name, ' ', last_name) as employee_full_name from employee	0 row(s) affected 0.000 sec

# Part B4

## Jaunty Coffee Co. *(continued)*

### *(a) Create Index*

```
1 • use jaunty_coffee_co;
2
3 • alter table coffee
4     add index index_coffee_name (coffee_name);
```

### *(b) Output*

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
✓ 1	18:01:26	use jaunty_coffee_co	0 row(s) affected	0.000 sec
✓ 2	18:01:26	alter table coffee add index index_coffee_name (coffee_name)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.047 sec



# Part B5

## Jaunty Coffee Co. *(continued)*

### (a) Create SFW Query

```
1 • use jaunty_coffee_co;
2
3 • select *
4   from coffee
5  where price_per_pound >= 10;
```

### (b) Results

	coffee_id	shop_id	supplier_id	coffee_name	price_per_pound
▶	5153	856	3579	medium roast	10.00
	9422	609	1234	dark roast	12.00

### (b) Output

Output					
Action Output					
#	Time	Action	Message	Duration / Fetch	
✓ 1	18:22:03	use jaunty_coffee_co	0 row(s) affected	0.000 sec	
✓ 2	18:22:03	select * from coffee where price_per_pound >= 10 LIMIT 0, 1000	2 row(s) returned	0.000 sec / 0.000 sec	

# Part B6

## Jaunty Coffee Co. *(continued)*

### (a) Create Table Joins Query

```
1 • use jaunty_coffee_co;
2
3 • select coffee_shop.shop_id, coffee_shop.city, coffee.coffee_name, coffee.price_per_pound, supplier.supplier_id, supplier.company_name
4   from coffee_shop, coffee, supplier
5  where coffee_shop.shop_id = coffee.shop_id
6        and coffee.supplier_id = supplier.supplier_id
7        order by coffee.price_per_pound;
```

### (b) Results

	shop_id	city	coffee_name	price_per_pound	supplier_id	company_name
▶	715	chicago	light roast	8.00	2468	beans r us
	856	boston	medium roast	10.00	3579	espresso world
	609	philadelphia	dark roast	12.00	1234	coffee haven

### (b) Output

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	18:46:29	use jaunty_coffee_co	0 row(s) affected	0.000 sec
2	18:46:29	select coffee_shop.shop_id, coffee_shop.city, coffee.coffee_name, coffee.price_per_pound, supplier.supplier_id, supplier.company_name from coffee_sh...	3 row(s) returned	0.000 sec / 0.000 sec