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WGU

C170 VHT2 — VHT2 Task 1:

Normalization and Database Design

Part A

A. 1. Nora's Bagel Bin Database Blueprints

Second Normal Form (2NF)

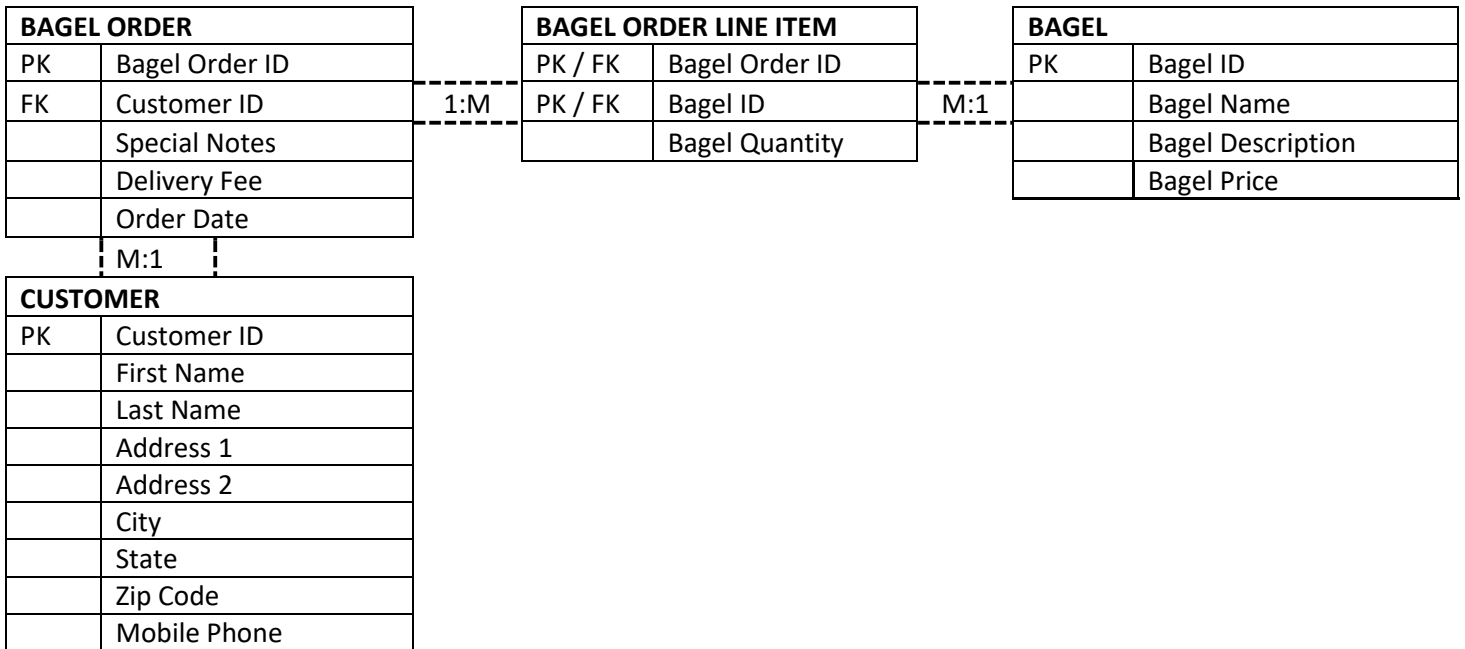
BAGEL ORDER			BAGEL ORDER LINE ITEM			BAGEL	
PK	Bagel Order ID		PK / FK	Bagel Order ID		PK	Bagel ID
	Order Date	1:M	PK / FK	Bagel ID	M:1		Bagel Name
	First Name			Bagel Quantity			Bagel Description
	Last Name						Bagel Price
	Address 1						
	Address 2						
	City						
	State						
	Zip Code						
	Mobile Phone						
	Delivery Fee						
	Special Notes						

A. 1. c.

I assigned the attributes to the 2NF table according to their relationships with the composite keys in BAGEL ORDER LINE ITEM. If they depend on only one part of the primary key, they are assigned to their appropriate new table, named correspondingly with BAGEL ORDER or BAGEL. If they depend on both, I assigned them (Bagel Quantity) to the one “original” table, BAGEL ORDER LINE ITEM table which contains foreign keys of both new tables’ primary keys (Bagel Order ID and Bagel ID). For cardinality, a single BAGEL ORDER can contain many BAGEL ORDER LINE ITEMS, as in one order must have at least one, but can have many, line item(s). Furthermore, at least one BAGEL ORDER LINE ITEM can have many BAGELS, as in there can be many line items, each allowing only one bagel per item.

A. 2.

Third Normal Form (3NF)

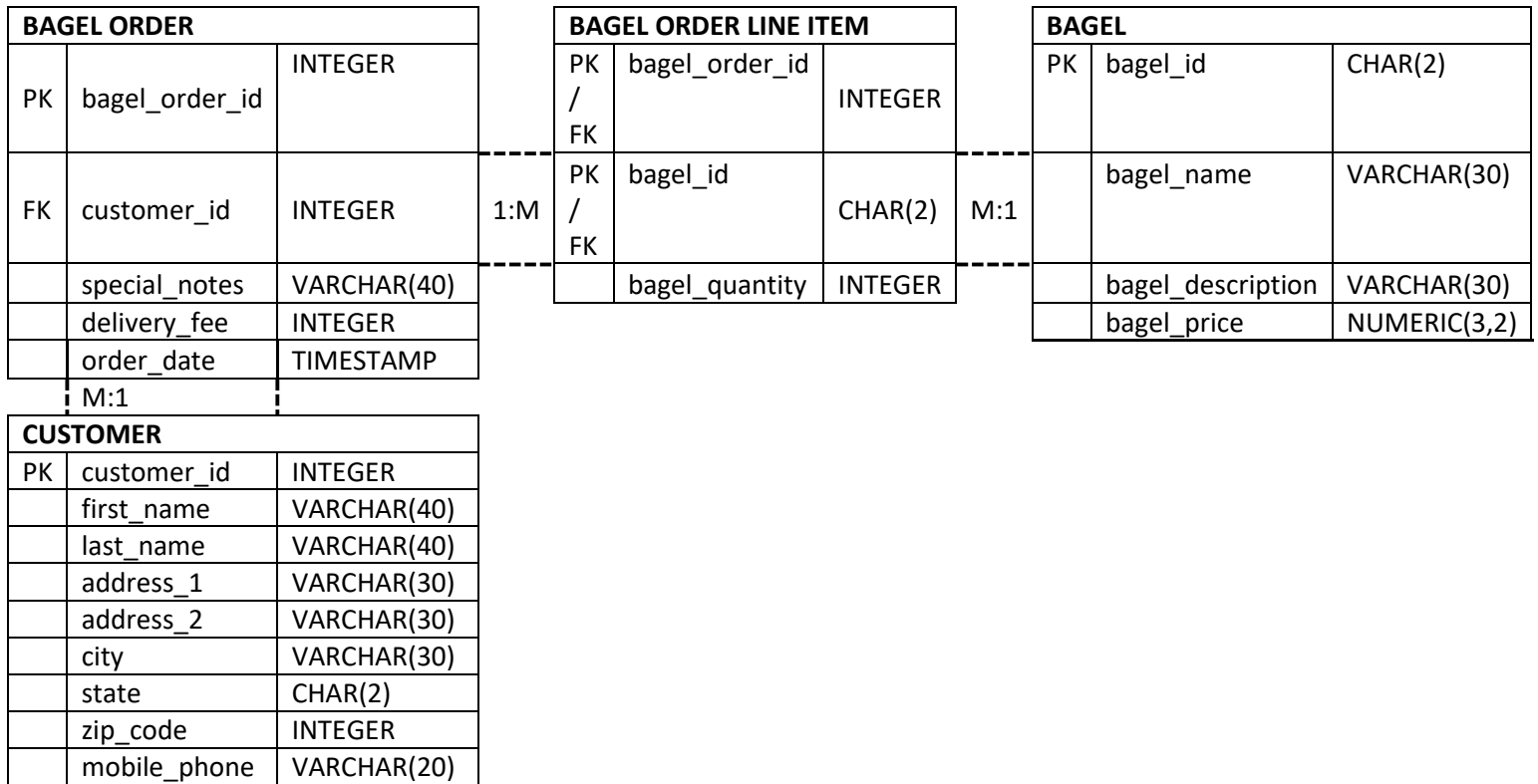


A. 2. e.

I assigned the attributes to the 3NF table by further eliminating redundancy within the tables and creating a fourth table, CUSTOMER, that holds all previously redundant information regarding the customer (first and last names, addresses, city, state, zip, and mobile phone). A new foreign key in BAGEL ORDER table named Customer ID became the new primary key in the CUSTOMER table as a result of this, as well as the fact that a bagel order must have a relationship with the customer ordering. All other attributes remained the same. The cardinalities also remained the same, except for establishing a cardinality between BAGEL ORDER table and CUSTOMER table. This new cardinality is M:1 because a single customer must order at least one, but overall can have, many orders.

A. 3.

Final Physical Database Model



PART B

B. 1. a.

```
CREATE TABLE coffee_shop (  
    shop_id INTEGER PRIMARY KEY,  
    shop_name VARCHAR(50),  
    city VARCHAR(50),  
    state CHAR(2)  
);  
  
CREATE TABLE employee (  
    employee_id INTEGER PRIMARY KEY,  
    shop_id INTEGER,  
    first_name VARCHAR(30),  
    last_name VARCHAR(30),  
    hire_date DATE,  
    job_title VARCHAR(30),  
    FOREIGN KEY (shop_id) REFERENCES coffee_shop(shop_id)  
);  
  
CREATE TABLE supplier (  
    supplier_id INTEGER PRIMARY KEY,  
    company_name VARCHAR(50),  
    country VARCHAR(30),  
    sales_contact_name VARCHAR(60),  
    email VARCHAR(50) NOT NULL  
);  
  
CREATE TABLE coffee (  
    coffee_id INTEGER PRIMARY KEY,  
    shop_id INTEGER,  
    supplier_id INTEGER,  
    coffee_name VARCHAR(30),  
    price_per_pound NUMERIC(5,2),  
    FOREIGN KEY (shop_id) REFERENCES coffee_shop(shop_id),  
    FOREIGN KEY (supplier_id) REFERENCES supplier(supplier_id)  
);
```

B. 1. b.

SQL Fiddle MySQL 5.6 View Sample Fiddle Clear Text to DDL Donate About

```
1 CREATE TABLE coffee_shop (  
2   shop_id INTEGER PRIMARY KEY,  
3   shop_name VARCHAR(50),  
4   city VARCHAR(50),  
5   state CHAR(2)  
6 );  
7
```

Build Schema Edit Fullscreen Browser [;] Run SQL Edit Fullscreen [;]

Schema Ready

SQL Fiddle MySQL 5.6 View Sample Fiddle Clear Text to DDL Donate About

```
1 CREATE TABLE coffee_shop (  
2   shop_id INTEGER PRIMARY KEY,  
3   shop_name VARCHAR(50),  
4   city VARCHAR(50),  
5   state CHAR(2)  
6 );  
7  
8 CREATE TABLE employee (  
9   employee_id INTEGER PRIMARY KEY,  
10  shop_id INTEGER,  
11  first_name VARCHAR(30),  
12  last_name VARCHAR(30),  
13  hire_date DATE,  
14  job_title VARCHAR(30),  
15  FOREIGN KEY (shop_id) REFERENCES coffee_shop(shop_id)  
16 );
```

Build Schema Edit Fullscreen Browser [;] Run SQL Edit Fullscreen [;]

Schema Ready

SQL Fiddle MySQL 5.6 View Sample Fiddle Clear Text to DDL Donate About

```
10  
11 shop_id INTEGER,  
12 first_name VARCHAR(30),  
13 last_name VARCHAR(30),  
14 hire_date DATE,  
15 job_title VARCHAR(30),  
16 FOREIGN KEY (shop_id) REFERENCES coffee_shop(shop_id)  
17 );  
18  
19 CREATE TABLE supplier (  
20   supplier_id INTEGER PRIMARY KEY,  
21   company_name VARCHAR(50),  
22   country VARCHAR(30),  
23   sales_contact_name VARCHAR(60),  
24   email VARCHAR(50) NOT NULL  
25 );
```

Build Schema Edit Fullscreen Browser [;] Run SQL Edit Fullscreen [;]

Schema Ready

SQL Fiddle MySQL 5.6 View Sample Fiddle Clear Text to DDL Donate About

```
20  
21 company_name VARCHAR(50),  
22 country VARCHAR(30),  
23 sales_contact_name VARCHAR(60),  
24 email VARCHAR(50) NOT NULL  
25 );  
26  
27 CREATE TABLE coffee (  
28   coffee_id INTEGER PRIMARY KEY,  
29   shop_id INTEGER,  
30   supplier_id INTEGER,  
31   coffee_name VARCHAR(30),  
32   price_per_pound NUMERIC(5,2),  
33   FOREIGN KEY (shop_id) REFERENCES coffee_shop(shop_id),  
34   FOREIGN KEY (supplier_id) REFERENCES supplier(supplier_id)  
35 );
```

Build Schema Edit Fullscreen Browser [;] Run SQL Edit Fullscreen [;]

Schema Ready

B. 2. a.

```
INSERT INTO coffee_shop VALUES
(10, 'Good Mornings', 'Asheville', 'TN'),
(11, 'Juggheads', 'Boone', 'NC'),
(12, 'Pepper Oak Brews', 'Turnersville', 'NJ');
```

```
INSERT INTO employee VALUES
(100, 10, 'First', 'Last', '2022-01-01', 'Barista'),
(101, 11, 'First1', 'Last1', '2021-09-27', 'Bartender'),
(102, 12, 'First2', 'Last2', '2023-12-21', 'Hostess');
```

```
INSERT INTO supplier VALUES
(1000, 'Great Grounds', 'United States', 'Meredith Way', 'merway@greatgrounds.com'),
(1001, 'Arabic Industries', 'UAE', 'Nassir Khalil', 'nkhalil133@arabind.uae.com'),
(1002, 'Jamaican Express Coffee', 'Jamaica', 'Rosalie Clarke', 'rosalieclarke@jec.com');
```

```
INSERT INTO coffee VALUES
(01, 50, 1000, 'Rise n Shine', 98.00),
(02, 51, 1001, 'Desert Dessert', 120.54),
(03, 52, 1002, 'Sun Roast', 116.76);
```

B. 2. b.

SQL Fiddle MySQL 5.6 View Sample Fiddle Clear Text to DDL Donate About

```
25
26 CREATE TABLE coffee (
27   coffee_id INTEGER PRIMARY KEY,
28   shop_id INTEGER,
29   supplier_id INTEGER,
30   coffee_name VARCHAR(30),
31   price_per_pound NUMERIC(5,2),
32   FOREIGN KEY (shop_id) REFERENCES coffee_shop(shop_id),
33   FOREIGN KEY (supplier_id) REFERENCES supplier(supplier_id)
34 );
35
36 INSERT INTO coffee_shop VALUES
37 (10, 'Good Mornings', 'Asheville', 'TN'),
38 (11, 'Juggheads', 'Boone', 'NC'),
39 (12, 'Pepper Oak Brews', 'Turnersville', 'NJ');
40
```

1

Build Schema Edit Fullscreen Browser Run SQL Edit Fullscreen

Schema Ready

SQL Fiddle

MySQL 5.6

View Sample Fiddle

Clear

Text to DDL

Donate

About

```
30 supplier_id VARCHAR(10),
31 coffee_name VARCHAR(30),
32 price_per_pound NUMERIC(5,2),
33 FOREIGN KEY (shop_id) REFERENCES coffee_shop(shop_id),
34 FOREIGN KEY (supplier_id) REFERENCES supplier(supplier_id)
35 );
36 INSERT INTO coffee_shop VALUES
37 (10, 'Good Mornings', 'Asheville', 'TN'),
38 (11, 'Juggheads', 'Boone', 'NC'),
39 (12, 'Pepper Oak Brews', 'Turnersville', 'NJ');
40
41 INSERT INTO employee VALUES
42 (100, 10, 'First', 'Last', '2022-01-01', 'Barista'),
43 (101, 11, 'First1', 'Last1', '2021-09-27', 'Bartender'),
44 (102, 12, 'First2', 'Last2', '2023-12-21', 'Hostess');
45
```

Build Schema

Edit Fullscreen

Browser

[:]

Run SQL

Edit Fullscreen

[:]

Schema Ready

SQL Fiddle

MySQL 5.6

View Sample Fiddle

Clear

Text to DDL

Donate

About

```
36 INSERT INTO coffee_shop VALUES
37 (10, 'Good Mornings', 'Asheville', 'TN'),
38 (11, 'Juggheads', 'Boone', 'NC'),
39 (12, 'Pepper Oak Brews', 'Turnersville', 'NJ');
40
41 INSERT INTO employee VALUES
42 (100, 10, 'First', 'Last', '2022-01-01', 'Barista'),
43 (101, 11, 'First1', 'Last1', '2021-09-27', 'Bartender'),
44 (102, 12, 'First2', 'Last2', '2023-12-21', 'Hostess');
45
46 INSERT INTO supplier VALUES
47 (1000, 'Great Grounds', 'United States', 'Meredith Way', 'merway@greatgrounds.com'),
48 (1001, 'Arabic Industries', 'UAE', 'Nassir Khalil', 'nkhalil133@arabind.uae.com'),
49 (1002, 'Jamaican Express Coffee', 'Jamaica', 'Rosalie Clarke', 'rosalieclarke@jec.com');
50
51
```

Build Schema

Edit Fullscreen

Browser

[:]

Run SQL

Edit Fullscreen

[:]

Schema Ready

SQL Fiddle

MySQL 5.6

View Sample Fiddle

Clear

Text to DDL

Donate

About

```
41 INSERT INTO employee VALUES
42 (100, 10, 'First', 'Last', '2022-01-01', 'Barista'),
43 (101, 11, 'First1', 'Last1', '2021-09-27', 'Bartender'),
44 (102, 12, 'First2', 'Last2', '2023-12-21', 'Hostess');
45
46 INSERT INTO supplier VALUES
47 (1000, 'Great Grounds', 'United States', 'Meredith Way', 'merway@greatgrounds.com'),
48 (1001, 'Arabic Industries', 'UAE', 'Nassir Khalil', 'nkhalil133@arabind.uae.com'),
49 (1002, 'Jamaican Express Coffee', 'Jamaica', 'Rosalie Clarke', 'rosalieclarke@jec.com');
50
51 INSERT INTO coffee VALUES
52 (01, 10, 1000, 'Rise n Shine', 98.00),
53 (02, 11, 1001, 'Desert Dessert', 120.54),
54 (03, 12, 1002, 'Sun Roast', 116.76);
55
56
```

Build Schema

Edit Fullscreen

Browser

[:]

Run SQL

Edit Fullscreen

[:]

Schema Ready

B. 3. a.

```
CREATE VIEW employee_table  
  
AS SELECT "employee_id",  
  
        CONCAT(employee.first_name,' ',employee.last_name) employee_full_name,  
  
        hire_date,  
  
        job_title,  
  
        shop_id  
  
FROM employee;
```

B. 3. b.

The screenshot shows the SQL Fiddle interface. The SQL editor contains the following code:

```
48 (1001, 'Arabic Industries', 'UAE', 'Nassir Khalil', 'nkhalil133@arabind.uae.com'),  
49 (1002, 'Jamaican Express Coffee', 'Jamaica', 'Rosalie Clarke', 'rosalieclarke@jec.co  
50  
51 INSERT INTO coffee VALUES  
52 (01, 10, 1000, 'Rise n Shine', 98.00),  
53 (02, 11, 1001, 'Desert Dessert', 120.54),  
54 (03, 12, 1002, 'Sun Roast', 116.76);  
55  
56 CREATE VIEW employee_table  
57 AS SELECT "employee_id",  
58         CONCAT(employee.first_name,' ',employee.last_name) employee_full_name,  
59         hire_date,  
60         job_title,  
61         shop_id  
62 FROM employee;  
63
```

The results pane on the right shows two rows of data:

1
2

Buttons at the bottom include "Build Schema", "Edit Fullscreen", "Browser", "Run SQL", "Edit Fullscreen", and "Schema Ready" status.

B. 4. a.

```
CREATE INDEX coffee_index  
  
ON coffee(coffee_name);
```

B. 4. b.

The screenshot shows the SQL Fiddle interface. The SQL editor contains the following code:

```
51 INSERT INTO coffee VALUES  
52 (01, 10, 1000, 'Rise n Shine', 98.00),  
53 (02, 11, 1001, 'Desert Dessert', 120.54),  
54 (03, 12, 1002, 'Sun Roast', 116.76);  
55  
56 CREATE VIEW employee_table  
57 AS SELECT "employee_id",  
58         CONCAT(employee.first_name,' ',employee.last_name) employee_full_name,  
59         hire_date,  
60         job_title,  
61         shop_id  
62 FROM employee;  
63  
64 CREATE INDEX coffee_index  
65 ON coffee(coffee_name);  
66
```

The results pane on the right shows one row of data:

1

Buttons at the bottom include "Build Schema", "Edit Fullscreen", "Browser", "Run SQL", "Edit Fullscreen", and "Schema Ready" status.

B. 5. a.

```
SELECT *  
  
FROM supplier  
  
WHERE company_name = 'Great Grounds';
```

B. 5. b.

SQL Fiddle MySQL 5.6 View Sample Fiddle Clear Text to DDL Donate About

```
50  
51 INSERT INTO coffee VALUES  
52 (01, 10, 1000, 'Rise n Shine', 98.00),  
53 (02, 11, 1001, 'Desert Dessert', 120.54),  
54 (03, 12, 1002, 'Sun Roast', 116.76);  
55  
56 CREATE VIEW employee_table  
57 AS SELECT "employee_id",  
58 CONCAT(employee.first_name, ' ', employee.last_name) employee_full_name,  
59 hire_date,  
60 job_title,  
61 shop_id  
62 FROM employee;  
63  
64 CREATE INDEX coffee_index  
65 ON coffee(coffee_name);
```

```
1 SELECT *  
2 FROM supplier  
3 WHERE company_name = 'Great Grounds';  
4
```

Build Schema Edit Fullscreen Browser [;] Run SQL Edit Fullscreen [;]

supplier_id	company_name	country	sales_contact_name	email
1000	Great Grounds	United States	Meredith Way	merway@greatgrounds.com

Record Count: 1; Execution Time: 5ms View Execution Plan link

B. 6. a.

```
SELECT *  
  
FROM coffee_shop A LEFT JOIN employee B  
ON A.shop_id = B.shop_id  
  
LEFT JOIN coffee c  
ON C.shop_id = B.shop_id  
  
LEFT JOIN supplier d  
ON D.supplier_id = C.supplier_id;
```

B. 6. b.

SQL Fiddle MySQL 5.6 View Sample Fiddle Clear Text to DDL Donate About

```
14 job_title VARCHAR(30),
15 FOREIGN KEY (shop_id) REFERENCES coffee_shop(shop_id)
16 );
17
18 CREATE TABLE supplier (
19   supplier_id INTEGER PRIMARY KEY,
20   company_name VARCHAR(50),
21   country VARCHAR(30),
22   sales_contact_name VARCHAR(60),
23   email VARCHAR(50) NOT NULL
24 );
25
26 CREATE TABLE coffee (
27   coffee_id INTEGER PRIMARY KEY,
28   shop_id INTEGER,
29   supplier_id INTEGER,
```

```
1 SELECT *
2 FROM coffee_shop A LEFT JOIN employee B
3 ON A.shop_id = B.shop_id
4 LEFT JOIN coffee C
5 ON C.shop_id = B.shop_id
6 LEFT JOIN supplier D
7 ON D.supplier_id = C.supplier_id;
8
```

Build Schema Edit Fullscreen Browser [;] Run SQL Edit Fullscreen [;]

shop_id	shop_name	city	state	employee_id	shop_id	first_name	last_name	hire_date	job_title	coffee_id	shop_id	supplier_id	coffee_name	price_per_pound	supplier_id	company_name	country
10	Good Mornings	Asheville	TN	100	10	First	Last	2022-01-01	Barista	1	10	1000	Rise n Shine	98	1000	Great Grounds	United States
11	Juggheads	Boone	NC	101	11	First1	Last1	2021-09-27	Bartender	2	11	1001	Desert Dessert	120.54	1001	Arabic Industries	UAE
12	Pepper Oak Brews	Turnersville	NJ	102	12	First2	Last2	2023-12-21	Hostess	3	12	1002	Sun Roast	116.76	1002	Jamaican Express Coffee	Jamaica

Record Count: 3; Execution Time: 7ms View Execution Plan link