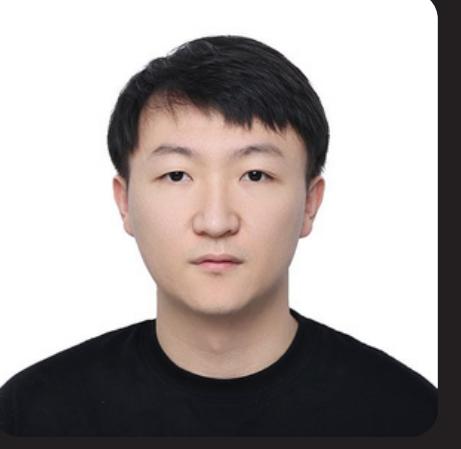


# RELATIONAL DATABASE FOR DACHENG BISTRO



Management of Organizational Data

Purdue MSBAIM 2024



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# 01 CLIENT INTRO



Dacheng is renowned as a culinary influencer in Taiwan. Dacheng Bistro is an online business specializing in instant food products, including jams, noodles, and hotpot ingredients.



# 01 CLIENT INTRO



Dacheng requests we help with efficiently managing and organizing data pertaining to customers, orders, products, delivery systems, payment methods, and so on.



## 02 BUSINESS OBJECTIVES

01

### **Operation Management:**

Operation Management: to improve the operation efficiency by providing a robust SQL database

02

### **Increase sales:**

Analyze the annual sales cycle to enable the client to enhance promotion during peak sales seasons to improve revenue.

03

### **Provide statistics:**

Provide statistics about the best and worst performing products



# STRATEGIES

**01**

## **completion rate**

What percentage of payments are actually completed?

**02**

## **average payment**

What is the average amount of money spent per customer?

**03**

## **item amount**

What is the average order number of items bought per customer?

**04**

## **loyal customer**

Who are the most loyal customers?

**05**

## **city**

Which city has the most customers?

**06**

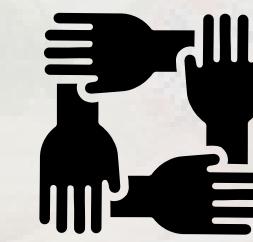
## **delivery**

What is the percentage share of each delivery method?

(loyalty calculated based on RFM:  
recency, frequency and monetary)



# BUSINESS INSIGHTS



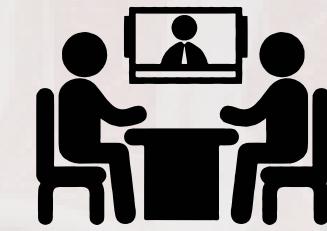
best-seller?

What is the  
best-selling  
category/item  
by amount  
sold?



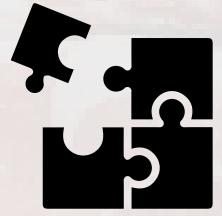
worst-seller?

What is the  
worst-selling  
category/item  
by amount?



peak-month?

What is the  
peak month  
for sales?



best promotion?

Which  
promotions  
result in  
higher orders?

# 03 ENTITIES INTRO

There are 8 entities in the ERD presented in rectangular shapes. Each entity will become a table in the final database.

The attributes associated with each of these are presented in oval shapes and the relationships are presented in diamond shapes.

|   |          |   |             |
|---|----------|---|-------------|
| 1 | Order    | 5 | Customer    |
| 2 | Product  | 6 | Coupon      |
| 3 | Payment  | 7 | Promotion   |
| 4 | Delivery | 8 | Composition |

# 04

## ENTITY RELATIONSHIP DIAGRAM

8 entities in the ERD  
are presented in  
rectangular shapes.





# 05 NORMAL FORM RELATIONAL SCHEMA

Customer (CustomerID, CustomerName, CustomerPhone#, CustomerCity)

Product (ProductID, ProductName, ProductType, ProductCategory, ProductPrice)

Delivery (DeliveryID, DeliveryStatus, DeliveryMethod, DeliveryFee, CustomerRecievedTime, DeliveryCity, ShippingDateTime, DeliveryCompany)

Coupon (Coupon ID, CouponName, CouponAmount)

Promotion (PromotionID, PromotionName, PromotionAmount)

Payment (PaymentID, PaymentMethod, PaymentDateTime, PaymentStatus)

Order (OrderID, CustomerID, PaymentID, CouponID, DeliveryID, OrderDateTime, CancelDateTime, OrderStatus, OrderValue)

OrderComposition (OrderID, ProductID, Quantity, PromotionID)

# 07 ANALYSIS AND INSIGHTS

## QUESTION 1

What is the best-selling category/item by amount sold?

```
1  ##Analysis
2  #1. What is the best-selling category/item by amount sold?
3  • select distinct(a.product_category) as "Product Category", sum(c.TotalAmount) as "Total Sales"
4  from sc.products as a
5  join sc.order_composition as b
6  join sc.orders as c
7  on a.product_ID = b.product_id and b.order_id = c.OrderID
8  where (c.OrderStatus = "Closed") and (a.product_category is not null or a.product_category <> '')
9  group by a.product_category
10 order by sum(c.TotalAmount) desc
11 limit 2
12 offset 1; #There are blanks in product category since the business is new, so excluding the blank row
13
14
15
16
```

100% 1:16

Result Grid Filter Rows: Search Export: Fetch rows:

| Product Category | Total Sales |
|------------------|-------------|
| dried noodles    | 12037914    |
| hot pot food     | 6044378     |

Result Grid Form Editor Field Tools

# 07 ANALYSIS AND INSIGHTS

## QUESTION 2

What is the worst-selling category/item by amount?

```
18  ##Analysis
19  #2. What is the worst-selling category/item by amount?
20 • select distinct(a.product_category) as "Product Category", sum(c.TotalAmount) as "Total Sales"
21  from sc.products as a
22  join sc.order_composition as b
23  join sc.orders as c
24  on a.product_ID = b.product_id and b.order_id = c.OrderID
25  where (c.OrderStatus = "Closed") and (a.product_category is not null or a.product_category <> '')
26  group by a.product_category
27  order by sum(c.TotalAmount) asc
28  limit 2;
29
30
31
32
33
```

The screenshot shows a database query results grid. The grid has two columns: 'Product Category' and 'Total Sales'. There are two rows of data: 'one-flavor jam' with a total sales of 576106, and 'mixed flavor jam' with a total sales of 1095307. The grid includes standard data manipulation toolbar buttons like 'Result Grid', 'Filter Rows', 'Search', 'Export', and 'Fetch rows'.

| Product Category | Total Sales |
|------------------|-------------|
| one-flavor jam   | 576106      |
| mixed flavor jam | 1095307     |



# 07 ANALYSIS AND INSIGHTS

## QUESTION 3

What is the peak month for sales?

```
35  ##Analysis
36  #3. What is the peak month for sales?
37 • select distinct monthname(a.OrderDateTime) as "Month", year(a.OrderDateTime) as "Year", sum(a.TotalAmount) as "Total Sales"
38  from sc.orders as a
39  where a.OrderStatus = "Closed"
40  group by monthname(a.OrderDateTime), year(a.OrderDateTime)
41  order by sum(a.TotalAmount) desc
42  limit 5;
43
44
45
46
47
48
49
50
```

100% 1:49

Result Grid Filter Rows: Search Export: Fetch rows: Result Grid Form Editor Field Types

| Month    | Year | Total Sales |
|----------|------|-------------|
| January  | 2022 | 3056367     |
| April    | 2022 | 2836177     |
| December | 2022 | 1586188     |
| November | 2022 | 1575620     |
| February | 2022 | 1354856     |

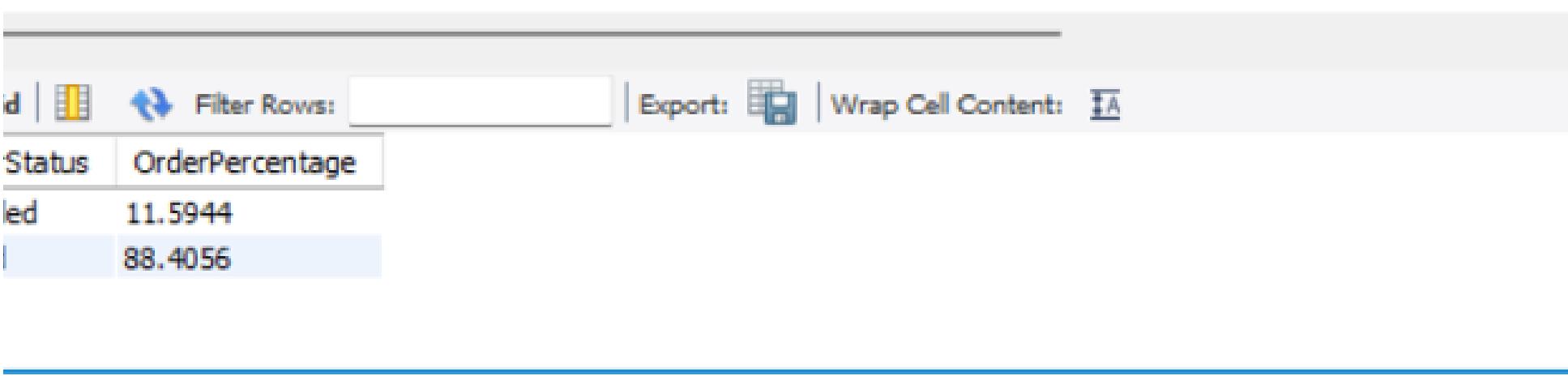
# 07 ANALYSIS AND INSIGHTS

## QUESTION 4

What percentage of payments are actually completed?

```
SET @TotalOrderCount = (SELECT COUNT(DISTINCT OrderID) FROM orders);

SELECT OrderStatus, (COUNT(DISTINCT OrderID))*100/@TotalOrderCount AS OrderPercentage
FROM orders
GROUP BY OrderStatus;
```



| Status    | OrderPercentage |
|-----------|-----------------|
| Completed | 11.5944         |
| Pending   | 88.4056         |

# 07 ANALYSIS AND INSIGHTS

## QUESTION 5

What is the average order amount (monetary) per customer?

```
6 •   SELECT SUM(TotalAmount)/COUNT(DISTINCT CustomerID) AS AverageRevenuePerCustomer  
7     FROM orders  
8     WHERE OrderStatus = "Closed";  
9  
10
```

| Result Grid               |  | Filter Rows: | Export: | Wrap Cell Content: |
|---------------------------|--|--------------|---------|--------------------|
| AverageRevenuePerCustomer |  |              |         |                    |
| 2491.7651398708886        |  |              |         |                    |

# 07 ANALYSIS AND INSIGHTS

## QUESTION 6

What is the average order amount (items) per customer?

```
4
5 •   SELECT COUNT(B.ProductID)/COUNT(DISTINCT A.CustomerID) AS AverageProductsPerCustomer
6     FROM orders AS A
7     LEFT JOIN order_composition AS B ON A.OrderID = B.OrderID
8     WHERE OrderStatus = "Closed";
9
```

| Result Grid                | Filter Rows: | Export: | Wrap Cell Content: |
|----------------------------|--------------|---------|--------------------|
| AverageProductsPerCustomer |              |         |                    |
| 3.7456                     |              |         |                    |

# 07 ANALYSIS AND INSIGHTS

## QUESTION 7

Get the most loyal customer list

```
49  # Loyal Customer Info
50  SELECT A.CustomerID,
51  IF(CustomerName = '', "Unknown", CustomerName) AS CustomerName,
52  IF(CustomerCity = '', "Unknown", CustomerCity) AS CustomerCity,
53  IF(CustomerPhoneNumber = '', "Unknown", CustomerPhoneNumber) AS CustomerPhoneNumber
54  FROM LoyalCustomers AS A
55  INNER JOIN Customer AS B ON A.CustomerID = B.CustomerID;
56
```

| Result Grid |            |              |                 |                     |
|-------------|------------|--------------|-----------------|---------------------|
|             | CustomerID | CustomerName | CustomerCity    | CustomerPhoneNumber |
| ▶           | 10536079   | Unknown      | Unknown         | Unknown             |
|             | 11056222   | Unknown      | nantou county   | Unknown             |
|             | 11561489   | Unknown      | Unknown         | Unknown             |
|             | 12094756   | Unknown      | miaoli county   | Unknown             |
|             | 12387105   | Unknown      | new taipei city | Unknown             |
|             | 12484779   | Unknown      | new taipei city | Unknown             |
|             | 6892204    | Unknown      | hsinchu city    | Unknown             |
|             | 8007700    | Unknown      | new taipei city | Unknown             |

# 07 ANALYSIS AND INSIGHTS

## QUESTION 8

Which promotions result in higher orders?

```
2 • select sum(quantity) as order_amount,PromotionName from order_composition as t1  
3   join promotion as t2  
4   on t1.PromotionID = t2.PromotionID  
5   group by PromotionName  
6   order by order_amount desc;  
7  
8
```

Result Grid | Filter Rows:  Export: Wrap Cell Content:

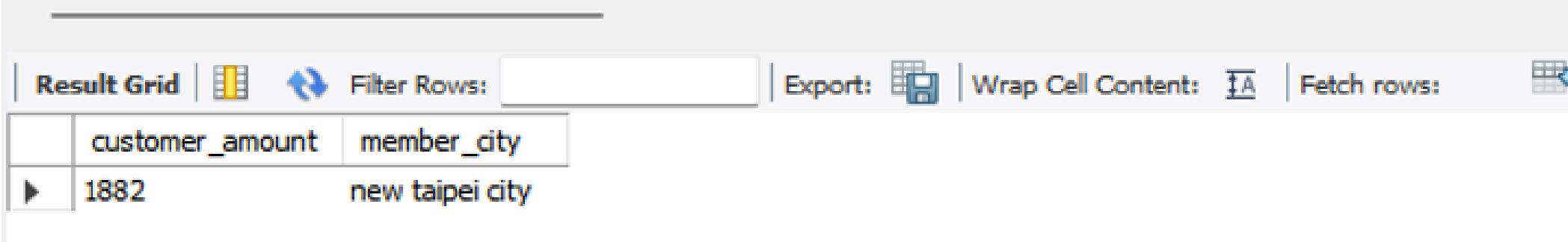
| order_amount | PromotionName                                      |
|--------------|--|
| 49647        | Choose 20 packs of dried noodles for \$850 or 3... |
| 28499        | Anniversary Event-Choose 27 packs of dried no...   |
| 7388         | 1111-Choose 27 packs of noodles for \$1111         |
| 2148         | 1111-Choose 8 boxes of hot pot food for \$1111     |
| 469          | Anniversary Event-Choose 4 jars of jam for \$999   |
| 271          | 1111-Choose 5 jars of jam for \$1111               |
| 248          | Grouponly-Choose 27 packages of noodles for ...    |
| 72           | Grouponly-Choose 8 boxes of hot pot food for ...   |
| 15           | Grouponly-Choose 5 jars of jam for \$1111          |

# 07 ANALYSIS AND INSIGHTS

## QUESTION 9

Which city has the most customers?

```
9      #9
10 •  select count(CustomerID) as customer_amount,member_city from orders as t1
11    left join customer as t2
12    on t1.CustomerID = t2.member_id
13    group by member_city
14    order by customer_amount desc
15    limit 1
16    offset 1;
```



The screenshot shows a MySQL query results window. At the top, there are several buttons: 'Result Grid' (selected), 'Filter Rows:' with a search bar, 'Export:' with a file icon, 'Wrap Cell Content:' with a checkbox, and 'Fetch rows:' with a grid icon. Below these buttons is a table with two columns: 'customer\_amount' and 'member\_city'. A single row is displayed, showing '1882' in the first column and 'new taipei city' in the second column. There is also a small navigation arrow pointing right next to the first column.

|   | customer_amount | member_city     |
|---|-----------------|-----------------|
| ▶ | 1882            | new taipei city |

# 07 ANALYSIS AND INSIGHTS

## QUESTION 10

What is the percentage share of each delivery method?

```
19 • select DeliveryMethod, count(DeliveryMethod) as total,  
20   (count(DeliveryMethod)*100)/(select count(*) from delivery) as percentage  
21   from delivery  
22   group by DeliveryMethod  
23   order by percentage desc;
```

Result Grid | Filter Rows:  Export: Wrap Cell Content:

| DeliveryMethod                    | total | percentage |
|-----------------------------------|-------|------------|
| 7-11cash on delivery              | 4301  | 47.1188    |
| home delivery(main island)        | 4005  | 43.8760    |
| 7-11 pick up                      | 777   | 8.5123     |
| frozen home delivery(main island) | 28    | 0.3067     |
| home delivery(outer islands)      | 15    | 0.1643     |
| t-cat delivery                    | 2     | 0.0219     |

# THANK YOU