LVX VERITAS VIRTVS

Chinese Restaurant Management System Database

Team 9: Fang-Ying Tien, Jingzhi Zhang, Yaqing Peng, Yiyun Lyu, Yi-Chieh Huang

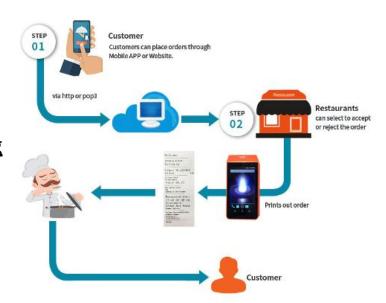


Agenda 🗐

- → 1.Fang-Ying Tien: Design Document
- → 2.Yiyun Lyu: ERD
- → 3.Jingzhi Zhang: SQL DDL
- → 4.Yaqing Peng: Views
- → 5.Yi-Chieh Huang: Visualization

Purpose:

- Systematically <u>organize and preserve critical</u> <u>restaurant data</u>
- Facilitate efficient management of <u>dish offerings</u>, <u>customer profiles</u>, <u>customer orders</u>, <u>and shopping</u> <u>carts</u>
- Enhance customer experience by streamline the process of <u>browsing menus</u>, <u>placing orders and</u> <u>making payment</u> in the restaurant



Business Problem Addressed:

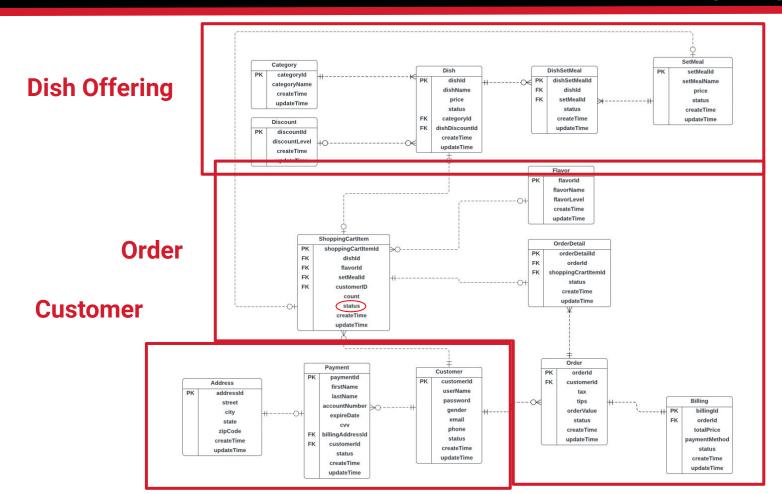
- Streamline <u>order management and menu organization</u>
- Generate reports to <u>analyze the overall business performance</u>

13 Entities:

- Category: Organize menu by categorizing dishes
- Dish: Manage dish offerings with unique IDs, names, prices, and statuses
- DishSetMeal: Establish connections between dishes and set meals
- SetMeal: Define bundled meal options
- Payment: Document customer payment details
- Flavor: Represent customer preferences for dish flavors
- Discount: Manage promotional offers on dishes
- OrderDetail: Detail each order and link to shopping cart items
- Order: Store information about customer orders
- Customer: Store customer profiles and account information
- Address: Store customer billing addresses
- Billing: Capture information related to bills paid by customers
- ShoppingCartItem: Enable customers to add dishes and set meals to shopping carts

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Table Creation:

PK, default time, default status and when status change

13 tables including Category, Discount, Dish, SetMeal, DishSetMeal, Flavor, Address, Customer, Payment, ShoppingCartItem, Order, OrderDetail and Billing

'ON' → 'OFF'

```
CREATE TABLE dbo.Dish (
    dishId INT IDENTITY NOT NULL PRIMARY KEY.
    dishName VARCHAR(255) NOT NULL.
    price DECIMAL(10, 2) NOT NULL,
   status VARCHAR(50) NOT NULL DEFAULT 'ON',
    categoryId INT NOT NULL REFERENCES Category(categoryId),
    dishDiscountId INT REFERENCES Discount(discountId),
    createTime DATETIME DEFAULT GETDATE(),
    updateTime DATETIME DEFAULT GETDATE()
CREATE TABLE SetMeal (
    setMealId INT IDENTITY NOT NULL PRIMARY KEY,
    setMealName VARCHAR(255) NOT NULL,
   price DECIMAL(10, 2) NOT NULL.
   status VARCHAR(50) NOT NULL DEFAULT 'ON',
    createTime DATETIME DEFAULT GETDATE(),
    updateTime DATETIME DEFAULT GETDATE()
CREATE TABLE DishSetMeal
    dishSetMealId INT IDENTITY NOT NULL PRIMARY KEY,
    dishId INT NOT NULL REFERENCES Dish(dishId),
    setMealId INT NOT NULL REFERENCES SetMeal(setMealId),
    status VARCHAR(50) NOT NULL DEFAULT 'ON',
    createTime DATETIME DEFAULT GETDATE(),
    updateTime DATETIME DEFAULT GETDATE()
```

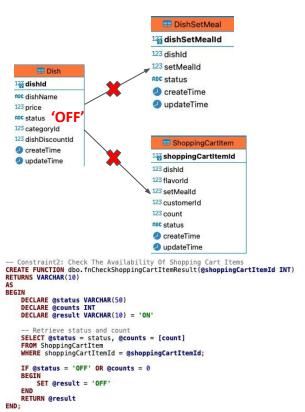
```
CREATE TABLE dbo.Customer
    customerId int IDENTITY NOT NULL PRIMARY KEY
    userName varchar(50) NOT NULL.
    password varchar(50) NOT NULL,
    gender varchar(50),
    email varchar(50),
    phone varchar(50),
    status varchar(50) DEFAULT 'ON'
    createTime DATETIME DEFAULT GETDATE(),
    updateTime DATETIME DEFAULT GETDATE()
CREATE TABLE dbo.Payment
    paymentId int IDENTITY NOT NULL PRIMARY KEY .
    firstName varchar(255) NOT NULL,
    lastName varchar(255) NOT NULL.
    accountNumber varchar(50) NOT NULL,
    expireDate DATETIME NOT NULL.
    cvv varchar(50) NOT NULL,
    billingAddressId int NOT NULL
        REFERENCES Address(addressId),
    customerId int NOT NULL
        REFERENCES Customer(customerId).
    status varchar(50) DEFAULT 'ON'
    createTime DATETIME DEFAULT GETDATE().
    updateTime DATETIME DEFAULT GETDATE()
CREATE TABLE ShoppingCartItem (
    shoppingCartItemId INT IDENTITY NOT NULL PRIMARY KEY.
    dishId INT REFERENCES Dish(dishId).
    flavorId INT REFERENCES Flavor(flavorId),
    setMealId INT REFERENCES SetMeal(setMealId),
    customerId INT NOT NULL REFERENCES Customer(customerId).
    [count] INT NOT NULL,
    status VARCHAR(50) NOT NULL DEFAULT 'ON'
    createTime DATETIME DEFAULT GETDATE(),
    updateTime DATETIME DEFAULT GETDATE()
```

'PROCESSING' → 'COMPLETED'

```
CREATE TABLE "Order" (
   orderId INT IDENTITY NOT NULL PRIMARY KEY,
   customerId INT NOT NULL REFERENCES "Customer"(customerId),
   tips AS (orderValue * 0.18) PERSISTED,
   orderValue DECIMAL(10.2).
  tax AS (orderValue * 0.1) PERSISTED,
   status VARCHAR(50) DEFAULT 'PROCESSING'
   createTime DATETIME DEFAULT GETDATE(),
   updateTime DATETIME DEFAULT GETDATE()
CREATE TABLE OrderDetail (
    orderDetailId INT IDENTITY NOT NULL PRIMARY KEY,
    shoppingCartItemId INT NOT NULL REFERENCES "shoppingCartItem"(shoppingCartItemId),
    orderId INT NOT NULL REFERENCES "Order"(orderId).
   status VARCHAR(50) DEFAULT 'PROCESSING'.
    createTime DATETIME DEFAULT GETDATE(),
    updateTime DATETIME DEFAULT GETDATE(),
CREATE TABLE dbo.Billing
    billingId int IDENTITY NOT NULL PRIMARY KEY,
    orderId int NOT NULL
        REFERENCES [Order] (orderId),
   paymentMethod varchar(50) NOT NULL,
   status varchar(50) DEFAULT 'PROCESSING',
    createTime DATETIME DEFAULT GETDATE(),
    updateTime DATETIME DEFAULT GETDATE()
```



Constraints & Functions



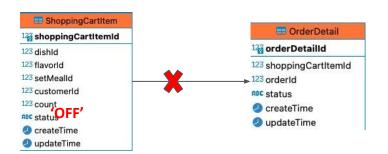
```
CREATE FUNCTION dbo.IsDishAvailable(@dishId INT)
RETURNS VARCHAR(50)
AS
BEGIN
DECLARE @status VARCHAR(50)

SELECT @status = status FROM Dish WHERE DishId = @dishID

RETURN @status;
END;

--Add a constraint on ShoppingCartItem to prevent inserting the dish that is out of stock
ALTER TABLE dbo.[ShoppingCartItem]
ADD CONSTRAINT [CHK_Dish_status] CHECK (dbo.IsDishAvailable(dishId) = 'ON');

--Add a constraint on DishSetMeal to prevent inserting the dish that is out of stock
ALTER TABLE dbo.[DishSetMeal]
ADD CONSTRAINT [CHK_DishSetMeal_status] CHECK (dbo.IsDishAvailable(dishId) = 'ON');
```



createTime

2023-01-01 12:00:00.000

updateTime

2023-01-01 12:00:00.000

123 totalPrice V

66.53

25.59



END;

Triggers & Computed Columns

123 billingld

123 orderld

▼ paymentMethod

1 Credit Card

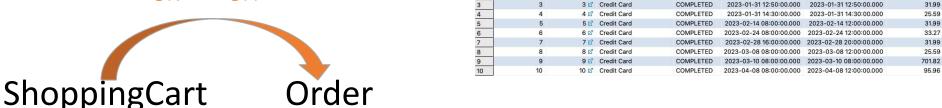
2 2 Credit Card

RBC status

COMPLETED

COMPLETED





```
--Trigger1: To switch status in shoppingCartItem to off after adding into orderDetail
DROP TRIGGER ChangeStatusWhenAddToOrder;
CREATE TRIGGER ChangeStatusWhenAddToOrder
ON OrderDetail
AFTER INSERT
AS
BEGIN
    SET NOCOUNT ON;
   UPDATE ShoppingCartItem
    SET status = 'OFF'
    FROM ShoppingCartItem sci
    INNER JOIN OrderDetail od
    ON sci.shoppingCartItemId = od.shoppingCartItemId
    WHERE sci.status = 'ON';
```

```
    Computed Column (totalPrice in Table Billing)

CREATE FUNCTION dbo.CalculateTotalPrice (@orderId int)
RETURNS DECIMAL(10, 2)
AS
BEGIN
    DECLARE @totalPrice DECIMAL(10, 2);
    SELECT @totalPrice = SUM(tax + tips + orderValue)
    FROM dbo. [Order]
    WHERE orderId = @orderId;
    RETURN ISNULL(@totalPrice, 0);
END:
ALTER TABLE dbo Billing
ADD totalPrice AS dbo.CalculateTotalPrice(orderId);
```

Data Insertion

(0.82, '2022-01-01', '2022-01-01').

(0.81, '2022-01-01', '2022-01-01');

```
-- Insert data into Dish table(with discount)
                                                                 INSERT INTO dbo.Dish (dishName, price, status, categoryId, dishDiscountId, createTime, updateTime)
                                                                      ('Kung Pao Chicken', 10.00, 'ON', 4, 1,'2022-01-01', '2022-01-01'),
-- Insert data into Category table
                                                                     ('Mapo Tofu', 15.00, 'ON', 4, 2, '2022-01-01', '2022-01-01'),
INSERT INTO dbo.Category (categoryName, createTime, updateTime)
                                                                     ('Wonton Soup', 20.00, 'ON', 3, 1, '2022-01-01', '2022-01-01')
VALUES
                                                                      ('Braised Pork', 30.00, 'ON', 4, 1, '2022-01-01', '2022-01-01'),
                                                                      ('Spring Rolls', 25.00, 'OFF', 2, 2, '2022-01-01', '2022-01-01'),
    ('Appetizer', '2022-01-01', '2022-01-01'),
                                                                      ('Sweet and Sour Pork', 30.00, 'ON', 4, 1, '2022-01-01', '2022-01-01'),
    ('Desert', '2022-01-01', '2022-01-01'),
                                                                     ('Hot and Sour Soup', 20.00, 'ON', 3, 1, '2022-01-01', '2022-01-01'),
                                                                                                                                                 INSERT INTO SetMeal (setMealName, price, status, createTime, updateTime) VALUES
    ('Soup', '2022-01-01', '2022-01-01'),
                                                                     ('Sichuan Noodles', 15.00, 'ON', 4, 2, '2022-01-01', '2022-01-01'),
    ('Main', '2022-01-01', '2022-01-01'),
                                                                                                                                                 ('Special A', 25.99, 'ON', '2022-01-01T08:00:00', '2022-01-01T12:00:00'),
                                                                      ('Peking Duck Rolls', 25.00, 'ON', 1, 1, '2022-01-01', '2022-01-01'),
                                                                                                                                                 ('Farewell A', 24.99, 'ON', '2022-02-09T08:00:00', '2022-02-09T12:00:00'),
    ('Drink', '2022-01-01', '2022-01-01'),
                                                                      ('Stir-fried Green Beans', 12.00, 'ON', 4, 2, '2022-01-01', '2022-01-01'),
                                                                                                                                                 ('Farewell B', 24.99, 'ON', '2022-02-09T08:00:00', '2022-02-09T12:00:00'),
    ('Side Dish', '2022-01-01', '2022-01-01'),
                                                                     ('Spring Onion Pancake', 8.00, 'ON', 1, 2, '2022-01-01', '2022-01-01'),
                                                                                                                                                ('Farewell C', 24.99, 'ON', '2022-03-28T08:00:00', '2022-03-28T12:00:00'),
    ('Breakfast', '2022-01-01', '2022-01-01'),
                                                                     ('Vegetable Spring Rolls', 10.00, 'OFF', 1, 1, '2022-01-01', '2022-01-01')
                                                                                                                                                ('Fresh A', 24.99, 'ON', '2022-04-01T08:00:00', '2022-04-01T12:00:00'),
                                                                     ('Crispy Shrimp Wontons', 12.00, 'ON', 1, 1, '2022-01-01', '2022-01-01'),
    ('Vegan', '2022-01-01', '2022-01-01').
    ('BBQ', '20
    ('Hot Pot'
                                                                                                                                                                                                           Address
                   Table
                                Dish
                                            Discount
                                                          Category
                                                                         Setmeal
                                                                                         Dish
                                                                                                     Shopping
                                                                                                                                   Order
                                                                                                                                                 Order
                                                                                                                                                               Billing
                                                                                                                                                                            Customer
                                                                                                                                                                                            Payment
                                                                                                                     Flavor
                                                                                       Setmeal
                                                                                                        Cart
                                                                                                                                   Detail
                   Name
                                                                                                                                                                                                                      ١),
-- Insert data
                                                                                                                                                                                                                      00:00'),
INSERT INTO db
                                                                                                                                                                                                                      00:00').
VALUES
                   (ON/)
                                               11
                                                                                                                                                               0/105
                                38/40
                                                              10
                                                                           13/15
                                                                                        18/18
                                                                                                       0/325
                                                                                                                       10
                                                                                                                                   0/325
                                                                                                                                                 0/105
                                                                                                                                                                              10/15
                                                                                                                                                                                             10/15
                                                                                                                                                                                                              15
    (0.90, '20
                   Total
                                                                                                                                                                                                                      :00:00').
    (0.80, '20
    (0.89, '202
                                                                      ('Cashew Chicken', 26.00, 'ON', 4, 2, '2022-01-01', '2022-01-01'),
    (0.88, '2022-01-01', '2022-01-01'),
                                                                      ('Eggplant with Garlic Sauce', 24.00, 'ON', 4, 1, '2022-01-01', '2022-01-01'),
    (0.87, '2022-01-01', '2022-01-01'),
                                                                     ('Hot and Spicy Beef', 30.00, 'ON', 4, 2, '2022-01-01', '2022-01-01'),
    (0.86, '2022-01-01', '2022-01-01'),
                                                                      ('Sweet and Sour Fish', 27.00, 'ON', 4, 1, '2022-01-01', '2022-01-01'),
    (0.85, '2022-01-01', '2022-01-01'),
                                                                      ('Cantonese Chow Mein', 25.00, 'ON', 4, 2, '2022-01-01', '2022-01-01'),
    (0.84, '2022-01-01', '2022-01-01'),
                                                                     ('Stir-fried Tofu with Vegetables', 23.00, 'ON', 4, 1, '2022-01-01', '2022-01-01'),
    (0.83, '2022-01-01', '2022-01-01'),
                                                                     ('Hunan Pork', 31.00, 'ON', 4, 2, '2022-01-01', '2022-01-01'),
```

('Shrimp with Lobster Sauce', 25.00, 'ON', 4, 1, '2022-01-01', '2022-01-01'),

('Kung Pao Shrimp', 22.00, 'ON', 4, 1, '2022-01-01', '2022-01-01'), ('General Tso's Chicken', 20.00, 'ON', 4, 1, '2022-01-01', '2022-01-01');

```
- Insert active Customer data
INSERT INTO dbo.Customer (userName, password, gender, email, phone, createTime, updateTime)
VALUES

('john_doe', 'password123', 'Male', 'john.doe@example.com', '123-456-7890', '2022-01-01', '2022-01-01'),
('jane_smith', 'securePW456', 'Female', 'jane.smith@example.com', '987-654-3210', '2022-01-01', '2022-01-01'),
('mike_jones', 'passw0rd', 'Male', 'mike.jones@example.com', '555-123-4567', '2022-01-01', '2022-01-01'),
('sarah_green', 'green123', 'Female', 'sarah.green@example.com', '333-999-8888', '2022-01-01', '2022-01-01'),
('alex_carter', 'carter456', 'Male', 'alex_carter@example.com', '777-222-1111', '2022-01-01', '2022-01-01'),
('lisa_brown', 'brownPass', 'Female', 'lisa.brown@example.com', '444-777-0000', '2022-01-01', '2022-01-01'),
('tom_wilson', 'wilson789', 'Male', 'tom.wilson@example.com', '666-444-2222', '2022-01-01', '2022-01-01'),
('emily_adams', 'adams2020', 'Female', 'emily_adams@example.com', '111-888-9999', '2022-01-01', '2022-01-01'),
('chris_evans', 'evansPWD', 'Male', 'chris.evans@example.com', '999-000-3333', '2022-01-01', '2022-01-01'),
('amy_white', 'whitePass', 'Female', 'amy.white@example.com', '222-555-6666', '2022-01-01', '2022-01-01');
```

```
INSERT INTO Flavor ( flavorName, flavorLevel, createTime, updateTime) VALUES
( 'Mild', 1, '2022-01-01', '2022-01-01'),
( 'Medium', 2, '2022-01-01', '2022-01-01'),
( 'Spicy', 3, '2022-01-01', '2022-01-01'),
( 'Extra Spicy', 4, '2022-01-01', '2022-01-01'),
( 'Normal Sugar', 3, '2022-01-01', '2022-01-01'),
( 'Less Sugar', 2, '2022-01-01', '2022-01-01'),
( 'No Sugar', 1, '2022-01-01', '2022-01-01'),
( 'Normal Ice', 3, '2022-01-01', '2022-01-01'),
( 'Light Ice', 2, '2022-01-01', '2022-01-01'),
( 'No Ice', 1, '2022-01-01', '2022-01-01');
```

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4. View1: Monthly Turnover of 2023

```
CREATE VIEW MonthlyTurnover AS
    SELECT MONTH(CreateTime) AS Month, SUM(TotalPrice) AS MonthlyRevenue
    FROM dbo.Billing
    WHERE Status = 'COMPLETED'
    GROUP BY MONTH(CreateTime);
```

123 Month	123 MonthlyRevenue
1	1,873.5
2	1,511.86
3	1,662.86
4	584.72
5	2,095.31
6	1,942.05
7	516.56
8	979.28
9	241.83
10	1,494.21
11	1,515.05
12	1,017.23

Objective: To present the overall business performance for the year 2023

Methodology: Sum up the <u>total price of "COMPLETED"</u> transactions from the <u>Billing</u> table, grouping the results by month

Findings:

- → Monthly revenue fluctuated, <u>peaking in May-June</u>
- → The remaining months has relatively lower revenues, with <u>April, July</u> and <u>Septempher</u> as the lowest three

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4. View2: Monthly Top 5 Sold Dishes of 2023

Objective: To present the most popular dishes for each month

Methodology:

- Sum up the <u>count of "COMPLETED"</u>
 dishes from the <u>orderDetail</u>
- Group by month and dishld
- Organize data in <u>horizontal</u> format

Findings:

- → Dishes are generally popular all the year round, peeking at Dec
- → No dishes ordered in April and Sept.
- → Kung Pao Shrimp is the most popular of all
- 123 Month Pact Top5SoldDishes(DishName: SoldQuantity)

 2 Spring Onion Pancake: 8, Braised Pork: 5, Hot and Spicy Beef: 5, Sichuan Noodles: 3, Coconut Tapioca Pudding: 3

 2 Sweet and Sour Fish: 4, Cantonese Chow Mein: 3, Shrimp with Lobster Sauce: 3, Peking Duck: 3, Braised Pork: 3, Sichuan Noodles: 3

 3 Eggplant with Garlic Sauce: 6, Mango Sticky Rice: 6, Tom Yum Soup: 6, Spicy Hot Pot: 5, Szechuan Shrimp: 4

 5 Kung Pao Shrimp: 6, Hunan Pork: 5, Hot and Spicy Beef: 5, Sweet and Sour Pork: 5, Hot and Sour Soup: 4, Crispy Shrimp Wontons: 4, Chinese Corn Soup: 4

 6 Kung Pao Shrimp: 10 Peking Duck: 5, Dim Sum: 5, Spring Onion Pancake: 5, Tom Yum Soup: 4

 7 Wonton Soup: 3, Sichuan Noodles: 2, Tom Yum Soup: 2, Hunan Pork: 2, Szechuan Shrimp: 2, Coca Cola: 2

 8 Hot and Spicy Beef: 6, Kung Pao Chicken: 5, Crispy Shrimp Wontons: 5, Sweet and Sour Fish: 4, Shrimp with Lobster Sauce: 3, Mango Sticky Rice: 3, Mapo Tofu: 3

 10 Kung Pao Shrimp: 7, Mongolian Beef: 6, Lychee Iced Tea: 5, Shrimp with Lobster Sauce: 5, Sweet and Sour Fish: 4

 11 Peking Duck: 5, Szechuan Shrimp: 4, Wonton Soup: 4, Kung Pao Chicken: 4, Spring Onion Pancake: 4

 12 Mango Sticky Rice: 6, Spring Onion Pancake: 6, Sweet and Sour Pork: 3, Coconut Tapioca Pudding: 3, Chinese Corn Soup: 3, Spicy Hot Pot: 3, Lychee Iced Tea: 3, Sweet and Sour Fish: 3

4. View 3: Monthly Top 5 Sold Setmeals of 2023

```
CREATE VIEW MonthlyTop5Setmeals AS
    WITH Temp AS (
        SELECT MONTH(OD.CreateTime) AS [Month], SetmealName + ': ' + CAST(SUM([Count]) AS VARCHAR) AS SetmealData,
            RANK() OVER(PARTITION BY MONTH(OD.CreateTime) ORDER BY SUM([Count]) DESC) AS [Rank]
        FROM dbo.OrderDetail OD
        JOIN dbo.ShoppingCartItem SHC
        ON OD.ShoppingCartItemId = SHC.ShoppingCartItemId
        JOIN dbo.SetMeal S
        ON SHC.SetmealId = S.SetmealId
        WHERE OD. Status = 'COMPLETED'
        GROUP BY MONTH(OD.CreateTime), SHC.SetmealId, SetmealName
    SELECT [Month], STRING_AGG(SetmealData, ', ') AS [Top5SoldSetmeals(SetmealName: SoldQuantity)]
    FROM Temp
    WHERE Rank <= 5
    GROUP BY [Month];
                 RBC Top5SoldSetmeals(SetmealName: SoldQuantity)
 123 Month
                 Fresh A: 6, Beginnings A: 6, Feast: 4, Special A: 3, Farewell A: 3, Farewell B: 3
                 Farewell C: 6 Farewell A: 4, Special A: 4, Kickoff: 3, Farewell B: 2, Fresh B: 2, Fresh A: 2
              3 Beginnings A: 3, Feast: 2, Special B: 1, Kickoff: 1, Fresh A: 1, Fresh B: 1
              4 Farewell B: 3, Kickoff: 3, Feast: 3, Special B: 2, Farewell C: 2, Farewell A: 2
              5 Fresh A: 3, Farewell A: 3, Farewell B: 2, Feast: 2, Beginnings A: 1, Farewell C: 1, Fresh B: 1
              6 Special B: 3, Kickoff: 2, Beginnings A: 1, Fresh B: 1
              7 Farewell A: 2, Special A: 1, Farewell B: 1
              8 Fresh A: 3, Farewell C: 1
```

11 Farewell A: 2, Special A: 1, Fresh B: 1, Fresh A: 1, Feast: 1, Beginnings A: 1

12 Farewell C: 3, Beginnings A: 2, Kickoff: 2, Farewell B: 1, Special A: 1

9 Kickoff: 3, Fresh A: 2, Fresh B: 1, Feast: 1

Special B: 3. Kickoff: 1. Special A: 1





most popular setmeals for

Methodology:

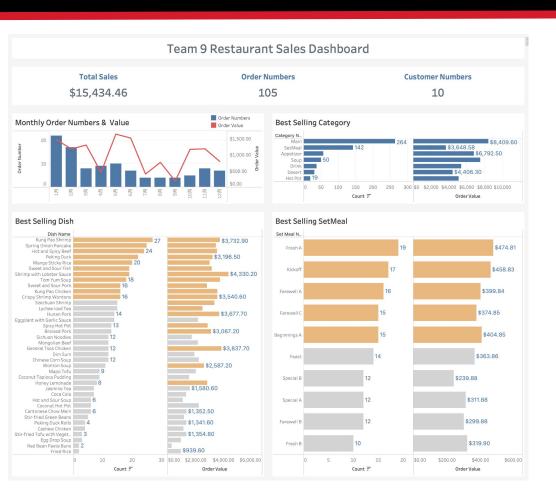
- Sum up the count of "COMPLETED" setmeals from the orderDetail
- Group by month and setmealld
- Organize data in horizontal format

Findings:

- Semeals are most popular in Jan-May
- Semeals are no so popular in Jun-Dec
- Fresh and Farewell are the most popular two types of setmeal

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5. Interactive Visualizations

- Total View in Sales Values , Orders, and Customers
- Monthly Orders Sales Values
- Best Selling Category
- Best Salling Dish
- Best Selling SetMeal



Thanks for listening!

Do you have any questions for us?