FFK café system: ERD

ERD design helps efficiently manage and query restaurant data, supporting various business processes such as order management, customer relationship management, and food delivery services. The following ERD is made by selecting entities, relationships, and attributes according to the FFK:

Entity types: We design customers, orders, menus, table numbers, items, payment methods, and reservations as entities, including primary keys such as the id of each entity to distinguish different information. Among them, we design the order as a superclass, and the delivery, dine-in and take-out entities as subclasses, inheriting some functions in the order so that customers can choose the way to eat. Weak entities have been added to payment methods to better balance customer payments with credit cards. Each entity encapsulates data related to specific aspects of restaurant operations, such as customer details, orders placed, menu items, payment processing, and staff management.

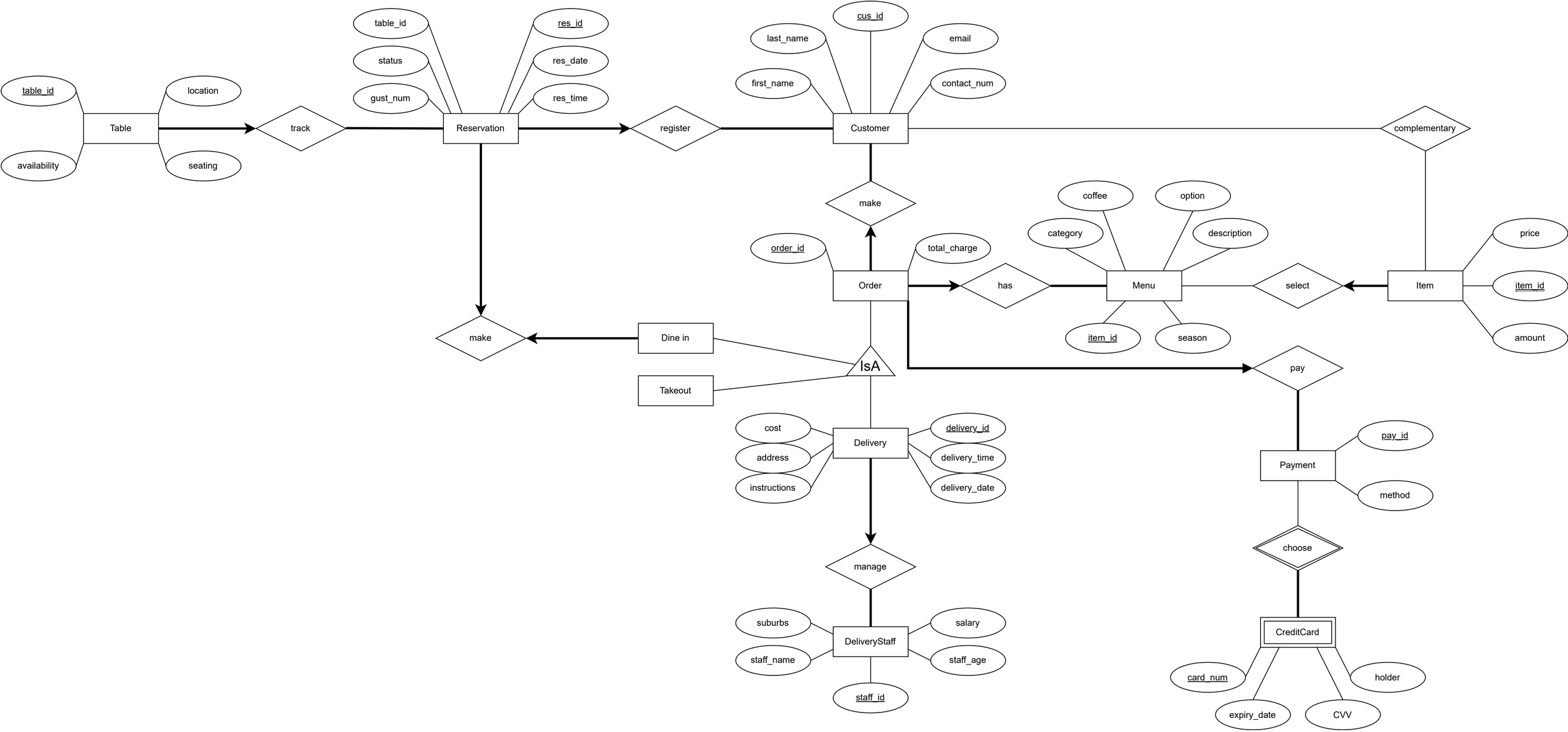
Relationship types will show how two entities relate to each other. Each customer can make multiple orders and choose their dining style (dine-in, take-out, delivery), each order can only made from one customer, the customer who chooses to dine in must be able to make a reservation in advance, the customer can register multiple reservations, each successful reservation must track and confirm the availability of the required tables; Multiple orders can be placed from multiple items on a menu, and each order is obtained from the current season's menu, and customers can easily find supplementary items; Customers need to choose a payment method to pay for all their orders; Every delivery order needs to be processed by a delivery staff, who can deliver food from one or more suburbs.

The attribute lists the contents of the entity. For example, each customer needs to have the name, email, contact number and other information; Each reservation information should contain the date, time, table and reservation phone number, and table status; The menu should contain the type, coffee, description and other information to facilitate customers to choose and place orders. The items in the menu should be priced and the quantity can be selected; Takeaways need to include delivery date, address, cost, time, customer requirements and other attributes, and take-out needs to include address, name, age, salary and other attributes. If choosing to pay by credit card, the credit card information, holder and date should be recorded. Provides the necessary information about the entity to help process orders or manage reservations, etc.

Primary keys: The primary key ensures that each record can be uniquely identified, such as setting the customer_id, order_id, etc. as the primary key for each entity. This is critical for maintaining database integrity and linking related data in different tables (for example, linking an order to a specific customer who placed the order).

Constraints define rules for maintaining data integrity in ERD. For things like foreign keys, ensure that relationships between entities are meaningful and valid associations between tables, such as an order that must be linked to an existing Customer; The reservation must be based on the valid date, time and number of people, the status of the table must be empty and the number of seats must match for the booking to be successful. When selecting a credit card payment, you must record the relevant card number and other information. Data inconsistency and errors are effectively avoided.

Design specialties: Design Order as a superclass, Dine in, Takeout, and Delivery as subclasses, connect with 'IsA' relationship, and set credit card as a weak entity for payment methods, indicating that payments can be made in different ways, but specifically, credit card payments require additional information such as card number and CVV.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