Part B / Design Normalized Database

Chung, Hyuk Jin

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Functional Dependencies

- For the relation represented by all of the columns in the CSV file, define all functional dependencies and list them.

VisitID → Restaurant, ServerEmpID, ServerName, StartDateHired, EndDateHired, HourlyRate, ServerBirthDate, ServerTIN, VisitDate, VisitTime, MealType, PartySize, Genders, WaitTime, CustomerName, CustomerPhone, CustomerEmail, LoyaltyMember, FoodBill, TipAmount, DiscountApplied, PaymentMethod, orderedAlcohol, AlcoholBill

ServerEmpID → ServerName, StartDateHired, EndDateHired, HourlyRate, ServerBirthDate, ServerTIN

CustomerEmail → CustomerName, CustomerPhone, LoyaltyMember

Based on the above functional dependencies, the VisitID uniquely identifies all the other attributes, ServerEmpID uniquely identifies server information, and CustomerEmail uniquely identifies customer information.

Relations in 3NF

- Using the functional dependencies and the rules of normalization, decompose the relational from the CSV into several relations that all satisfy 3NF; give the relations reasonable names.

In order to normalize the relation to 3NF, the relation must be broken into 3 separate tables to avoid transitive dependencies.

Visits (VisitID, Restaurant, ServerEmpID, VisitDate, VisitTime, MealType
PartySize, Genders, WaitTime, CustomerEmail, FoodBill, TipAmount,
DiscountApplied, PaymentMethod, orderedAlcohol, AlcoholBill)
Primary Key: **VisitID**

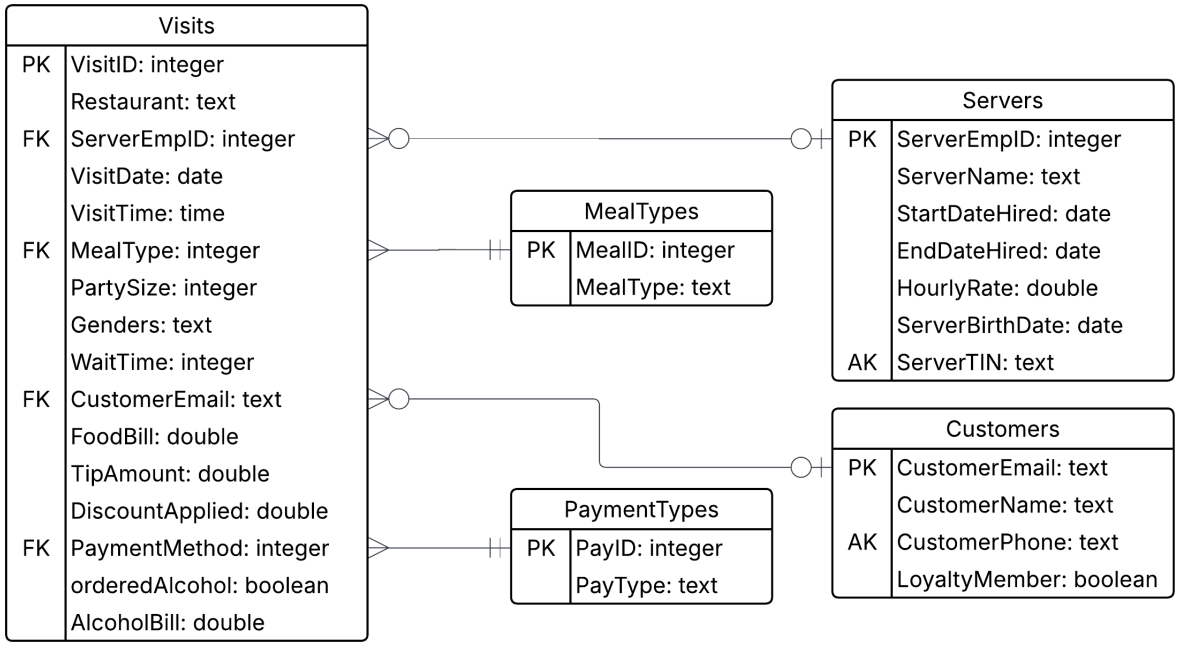
Servers (ServerEmpID, ServerName, StartDateHired, EndDateHired, HourlyRate, ServerBirthDate, ServerTIN)
Primary Key: **ServerEmpID**
Alternate Key: ServerTIN

Customers (CustomerEmail, CustomerName, CustomerPhone, LoyaltyMember)
Primary Key: **CustomerEmail**
Alternate Key: CustomerPhone

Entity-Relationship Diagram (in Crow's Feet notation)

- For the relations resulting from the normalization, create an ERD in the IE (Crow's Feet) notation. Add all attributes, attribute name, primary and foreign keys, data types, and entity descriptions.

Based on the data in the CSV file, the server and customer information can be NULL (a visit does not necessarily need to have a customer or server info), so the cardinality has been set accordingly.



Visits

Represents visits to restaurants and records info regarding each of the visits

Servers

Represents servers at the restaurants

Customers

Represents customers at the restaurants

Meal Types

Lookup table for classifying visit types by meal (Breakfast, Lunch, Dinner, Take-out)

Payment Types

Lookup table for classifying visit types by payment methods (Credit card, Mobile Payment, Cash)