Third Normal Form

The third normal form requires that all functional dependencies either have a superkey on the LHS, or a non-prime attribute on the RHS, *i.e.*, there are no dependencies from one non-prime attribute to another.
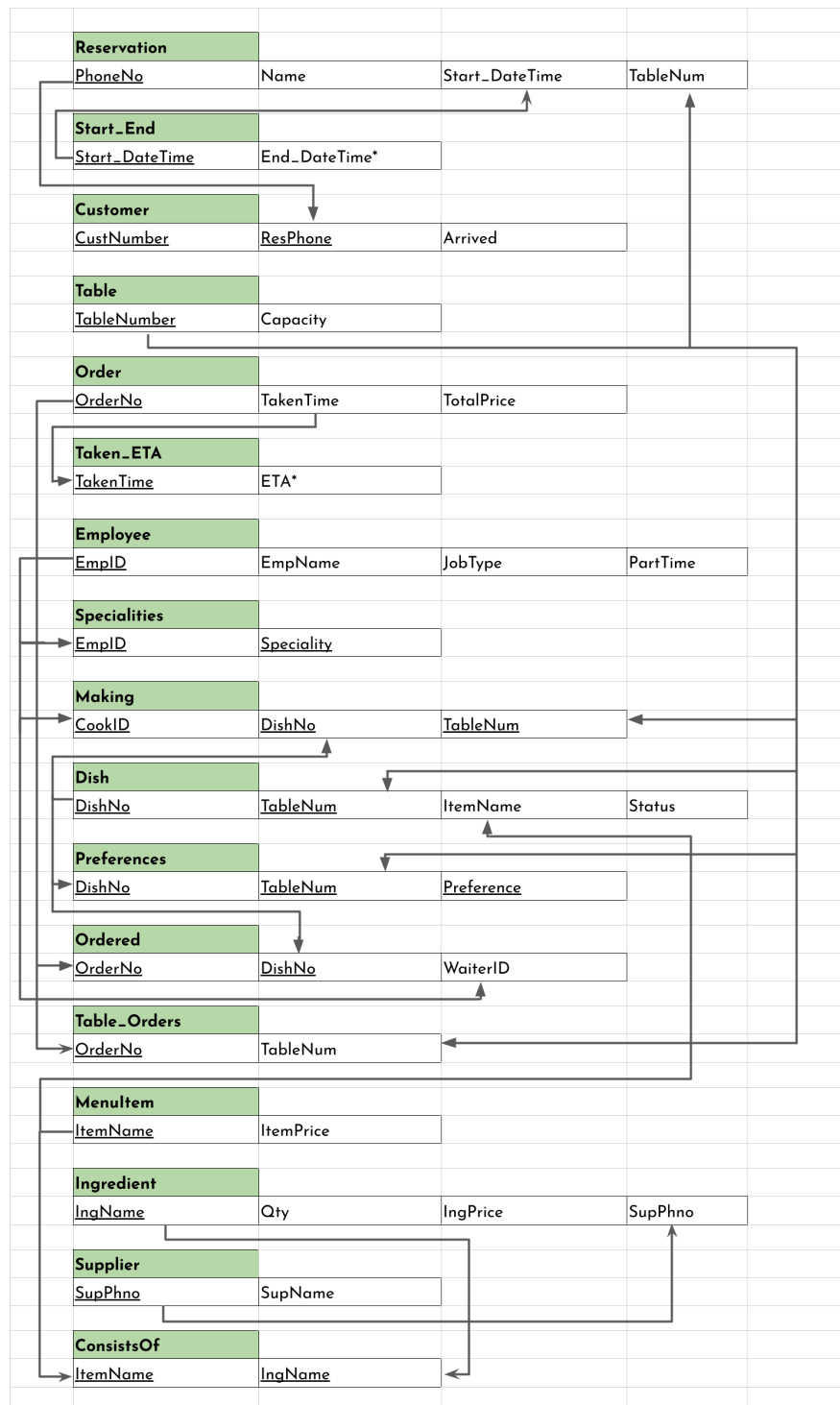
This is satisfied by all tables in which either there are no non-prime attributes, or there is only one. Among the other relations, three need to be decomposed.

In RESERVATION, End_DateTime is derived from Start_DateTime, which makes a functional dependency which does not satisfy 3NF. This is fixed by removing End_DatTime from RESERVATION and adding it as an attribute (with Start_DateTime as key) to a new relation, START_END.

Similarly, in ORDER, ETA is derived from TakenTime. This is solved analogously; ETA is removed from ORDER and added, with TakenTime as key, to a new relation named Taken_ETA.

In INGREDIENT, all suppliers have a unique phone number. Therefore we have the dependency SupPhno $\rightarrow$ SupName. This does not satisfy 3NF; we therefore create a new table, SUPPLIER, with SupPhno as key and SupName as an attribute, removing the latter from INGREDIENT.

These three changes satisfy the third normal form for the table.

Reservation

PhoneNo	Name	Start_DateTime	TableNum

Start_End

Start_DateTime	End_DateTime*

Customer

CustNumber	ResPhone	Arrived

Table

TableNumber	Capacity

Order

OrderNo	TakenTime	TotalPrice

Taken_ETA

TakenTime	ETA*

Employee

EmpID	EmpName	JobType	PartTime

Specialities

EmpID	Speciality

Making

CookID	DishNo	TableNum

Dish

DishNo	TableNum	ItemName	Status

Preferences

DishNo	TableNum	Preference

Ordered

OrderNo	DishNo	WaiterID

Table_Orders

OrderNo	TableNum

MenuItem

ItemName	ItemPrice

Ingredient

IngName	Qty	IngPrice	SupPhno

Supplier

SupPhno	SupName

ConsistsOf

ItemName	IngName

Third Normal Form