

## **Functional Dependencies**

1. SupplierID -> SupplierName, SupplierAddress, SupplierPhone  
(for Supplier)

2. DeliveryID -> SupplierID  
(for ProvidesDelivery)

3. ProductID -> PricePerCostUnit, CostUnit, ProductionDate, QuantityInStock, Brand, BestBeforeDate, PLU, UPC, Organic, Name, Cut, Animal, ProductType, AisleNumber)  
(for Product)

4. LocationNumber, AisleNumber -> AisleName  
(for Aisle)

The store's location number and aisle number determine the aisle name.

5. Name, Phone -> Email  
(for Customer)

6. TransactionNumber, ProductID, Quantity -> CustomerName, CustomerPhone, Date, Total)  
(for Purchases)

7. LocationNumber -> StoreName, StoreAddress  
(for Store)

The store's location number determines the store's name and address.

8. DepartmentName -> AisleNumber  
(for Department)

9. EmployeeID -> LocationNumber, DepartmentName, Position, EmployeeName, EmployeePhone, SIN, EmployeeAddress

10. Position -> Wage

## Candidate Keys

ProvidedBy: SupplierID, ProductID

Supplier: SupplierID

ProvidesDelivery: DeliveryID, SupplierID

ReceivedFrom: ProductID, DeliveryID

Product: ProductID

Customer: CustomerName, CustomerPhone

Purchases: TransactionNumber, ProductID, Quantity

ShopsAt: CustomerName, CustomerPhone, LocationNumber

Store: LocationNumber

HasDepartment: LocationNumber, DepartmentName

Department: DepartmentName

AisleContains: LocationNumber, AisleNumber, AisleName, DepartmentName

Employee: EmployeeID

## Normalization

After normalization, the following schemas change:

Employee(EmployeeID: Integer, **LocationNumber**: Integer, **DepartmentName**: String, **Position**: String, EmployeeName: String, EmployeePhone: String, SIN: Integer, EmployeeAddress: String)

PositionWage (Position: String, Wage: Integer)

All other tables remain unchanged because the determinants are primary keys.