

Week 3: Normalization

1. Revised List of Entities and Tables Identified

List of Entities in the model:

| Entity | Description |
|----------------------------|---------------------------------------------------------|
| Customer | Customer Information |
| SalesRepresentative | Designated Employee/Representative who Facilitates Sale |
| Part | Product and Part Offerings |
| Order | Purchase Record Invoice/Placed by customer |
| OrderLines | Line corresponding to each Part within an order |
| New Entities/tables | |
| SalesRep_Region | Sales Representative and Regions served |
| Zip | Zip Code and its City, State |
| Region | Region Details |

| Entity Name: | Customer |
|----------------------|----------------------|
| Description: | Customer Information |
| Field | Data Type |
| CustomerID (PK)(FK1) | VARCHAR(25) |
| SalesRepID (FK2) | VARCHAR(25) |
| LastName | VARCHAR(50) |
| FirstName | VARCHAR(50) |
| StreetAddress | VARCHAR(255) |
| ZipCode (FK3) | VARCHAR(10) |
| CurrentBalance | FLOAT |
| CreditLimit | FLOAT |

| Entity Name: | SalesRepresentative |
|----------------------|----------------------------------|
| Description: | Sales Representative Information |
| Field | Data Type |
| SalesRepID (PK, FK1) | VARCHAR(25) |
| LastName | VARCHAR(50) |
| FirstName | VARCHAR(50) |
| StreetAddress | VARCHAR(255) |
| ZipCode (FK2) | VARCHAR(10) |
| TotalCommission | FLOAT |
| CommissionRate | FLOAT |

| | |
|----------------------|-----------------------------------------|
| Entity Name: | Salesrep_Region |
| Description: | Sales Representative and Regions served |
| Field | Data Type |
| SalesRepID (PK, FK1) | VARCHAR(25) |
| Region (PK, FK2) | VARCHAR(50) |

| | |
|---------------------|----------------|
| Entity Name: | Region |
| Description: | Region Details |
| Field | Data Type |
| Region (PK, FK1) | VARCHAR(50) |
| Region Description | VARCHAR(255) |

| | |
|---------------------|------------------------------|
| Entity Name: | Zip |
| Description: | Zip Code and its City, State |
| Field | Data Type |
| ZipCode (PK, FK) | VARCHAR(10) |
| City | VARCHAR(25) |
| State | VARCHAR(25) |

| | |
|---------------------|--------------------|
| Entity Name: | Order |
| Description: | Record of Purchase |
| Field | Data Type |
| OrderID (PK, FK2) | VARCHAR(25) |
| Date | TIMESTAMP(0) |
| CustomerID (FK1) | VARCHAR(25) |
| ShippingDate | TIMESTAMP(0) |

| | |
|---------------------|--------------------------------------------------|
| Entity Name: | OrderLines |
| Description: | Invoice Lines Corresponding to parts in an order |
| Field | Data Type |
| OrderID (PK, FK1) | VARCHAR(25) |
| PartID (PK, FK2) | VARCHAR(25) |
| NumberOrdered | INTEGER |
| QuotedPrice | FLOAT |

| | |
|---------------------|--------------------------|
| Entity Name: | Part |
| Description: | Product & Part Offerings |
| Field | Data Type |
| PartID (PK, FK1) | VARCHAR(25) |
| PartDescription | VARCHAR(255) |
| UniteOnHand | INTEGER |
| Class | VARCHAR(255) |

| | |
|-----------------|-------------|
| WarehouseNumber | VARCHAR(25) |
| UnitPrice | FLOAT |

Directly-related entity type pairs (Relationships)

Customer – Order

Customer - ZIP

Customer - Sales Representative

Sales Representative – ZIP

Sales Representative – SalesRep_Region and SalesRep_Region– Region

Order – Order Lines

Part – Order Lines

2. For each direct entity type pair, provide the business rules. (25 points)

Customer – Order

- A Customer has Zero or More orders.
- An Order has 1 and only 1 Customer
 - Customer 1:M Order

Customer – ZIP

- Customer is related to only one zip record
 - Customer 1:1 ZIP

Sales Representative – Customer

- A Sales Representative may have zero or more customers.
 - SalesRepresentative 0:M Customer
- A Customer has 1 and only 1 Sales Representative
 - Customer M:1 SalesRepresentative

Sales Representative – ZIP

- Sales Representative is related to only one zip record
- Sales Representative 1:1 ZIP

Sales Representative – Region (SalesRep_Region)

- A Sales Representative may have 1 or more Regions

- Sales Representative 1:M Region
- A Region may have 1 or more Sales Representative
 - Region 1:M Sales Representative

Order – Order Lines

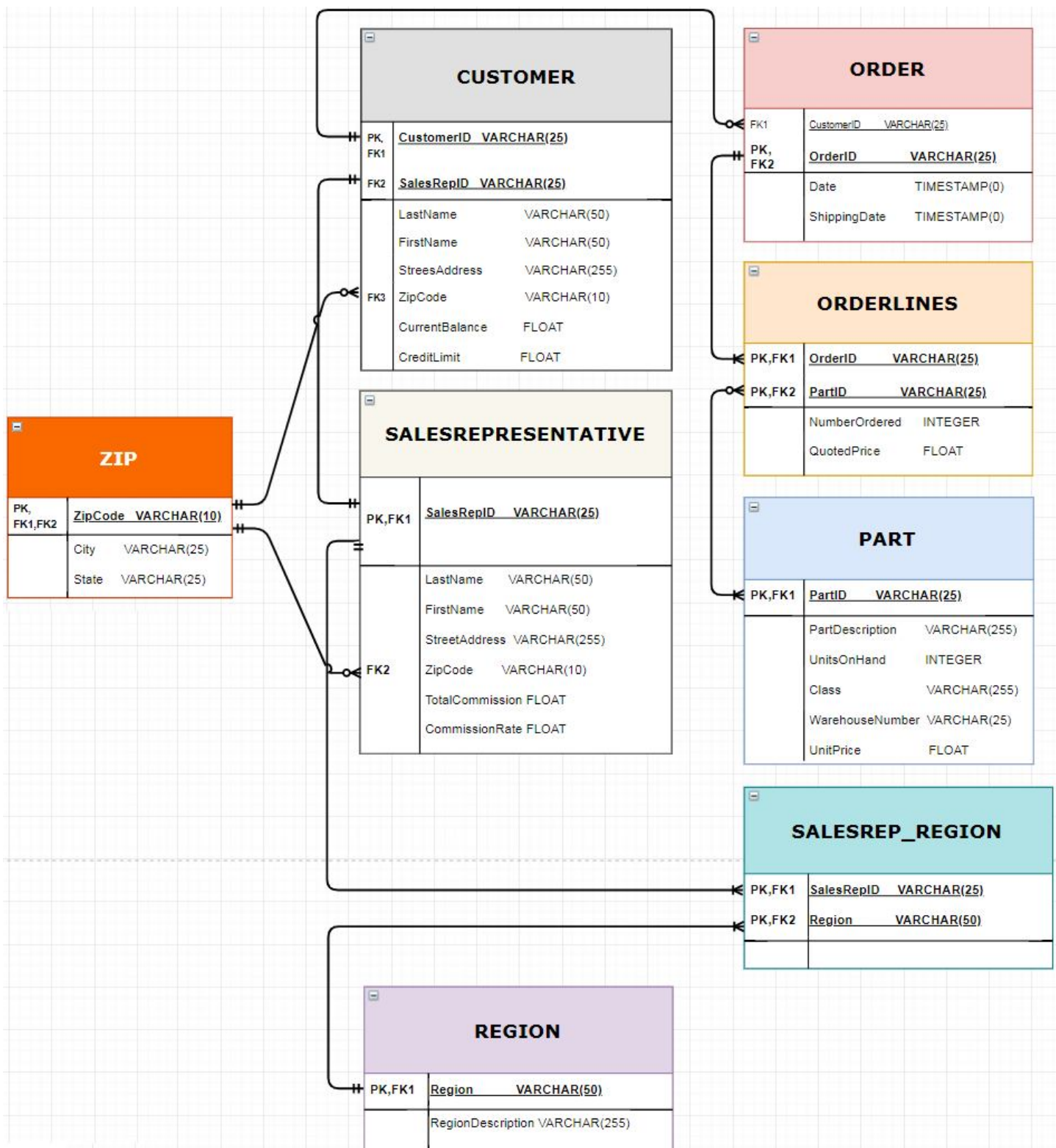
- An Order must have one or more Lines
 - Order 1:M OrderLines
- Each Order line is associated with One and only One Order
 - OrderLines M:1 Order

Part – Order Lines

- A Part may have zero or more orders Lines.
 - Part 0:M Orderlines
- Each Orderline has exactly 1 Part number
 - OrderLine 1:1 Part

3. Provide the ERD.

Entity Relationship Diagram



References:

Oppel, A. J. (2009). *Databases: A beginner's guide*. New York, NY: McGraw-Hill.

Laureate Education (Producer). (2011a). *Designing a database* [Video file]. Baltimore, MD: Author