Introduction

For this assignment, you will be converting the following ER diagram, which models the operational data for a department store, to a set of relations that conform to Third Normal Form (3NF). Use the steps from the slides that we went over in class. Make sure to indicate the primary keys by underlining them. Include a list of which attributes are foreign keys, with the home relation of each foreign key indicated.
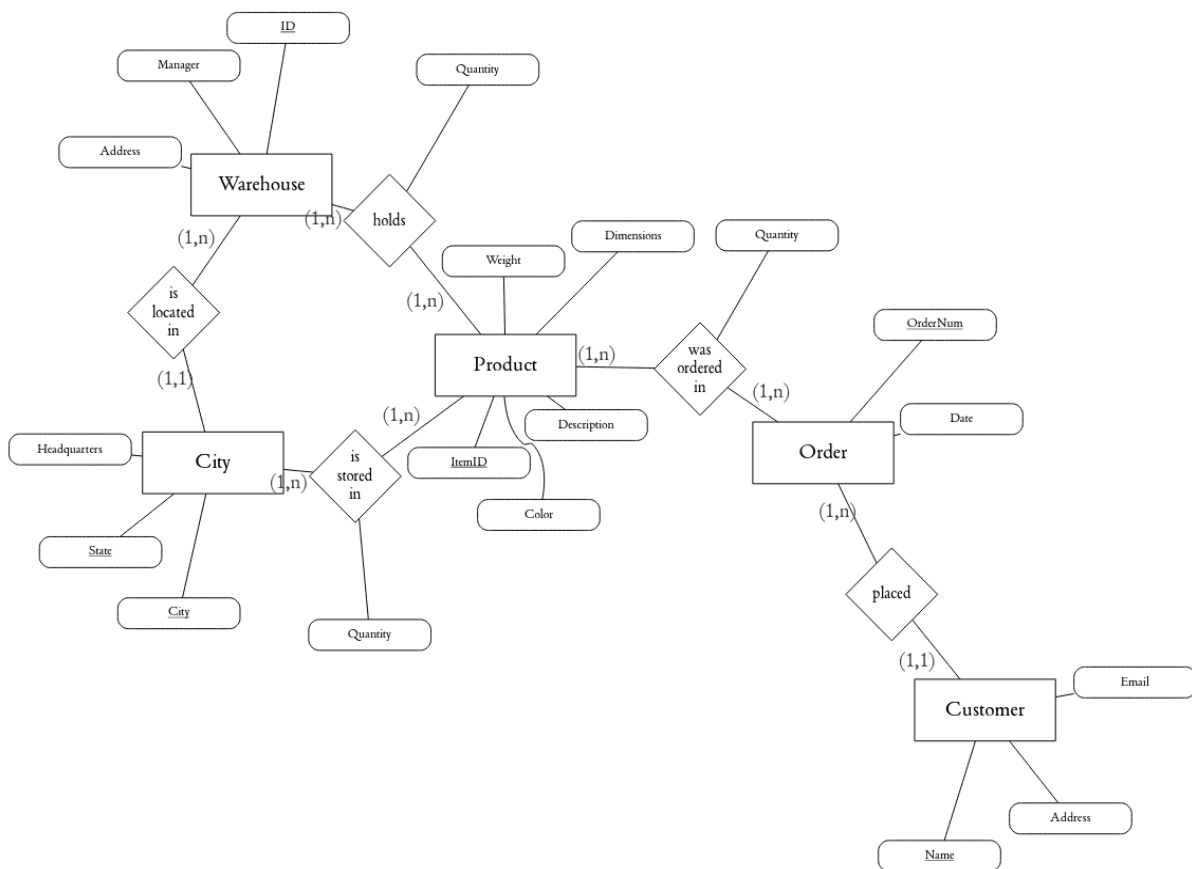
ER Diagram

Figure 1: This is the ER diagram. There may be some things that may seem weird. These may be errors that were missed during the design phase, or they could be intentional. The purpose of this assignment is to convert it, not to revise it.

1   Steps:

Entities

→ ***Warehouse***(<u>ID</u>, Manager, Address)

→ ***Product***(<u>ItemID</u>, Color, Description, Weight, Dimensions)

→ ***Order***(<u>OrderNum</u>, Date)

→ ***Customer***(<u>Name</u>, Address, Email)

→ ***City***(<u>City</u>, <u>State</u>, Headquarters)

Binary one-to-many relationships

→ ***Order***(<u>OrderNum</u>, Date, Name†)

→ ***Warehouse***(<u>ID</u>, Manager, Address, City†,State†)

Binary many-to-many

→ ***WarehouseProduct***(<u>ID†</u>, <u>ItemID†</u>, Quantity)

→ ***CityProduct***(<u>City†</u>, <u>State†</u>, <u>ItemID†</u>, Quantity)

→ ***ProductOrder***(<u>ItemID†</u>, <u>OrderNum†</u>, Quantity)

2   Foreign keys

- Name
  - foreign key in `Order` (`from Customer`)

- City (from `City`)
  - foreign key in `Warehouse`
  - foreign key in `CityProduct`

- State (from `City`)
  - foreign key in `Warehouse`
  - foreign key in `CityProduct`

- ID (from `Warehouse`)
  - foreign key in `WarehouseProduct`

- ItemID (`from Product`)
  - foreign key in `CityProduct`
  - foreign key in `ProductOrder`
  - foreign key in `Warehouse Product`

- OrderNum (`from Order`)
  - foreign key in `ProductOrder`

3   Final Schemas

→ **_Order_**(<u>OrderNum</u>, Date, Name†)

→ **_Warehouse_**(<u>ID</u>, Manager, Address, City†, State†)

→ **_Product_**(<u>ItemID</u>, Color, Description, Weight, Dimensions)

→ **_Customer_**(<u>Name</u>, Address, Email)

→ **_City_**(<u>City</u>, <u>State</u>, Headquarters)

→ **_WarehouseProduct_**(<u>ID</u>†, <u>ItemID</u>†, Quantity)

→ **_CityProduct_**(<u>City</u>†, <u>State</u>†, <u>ItemID</u>†, Quantity)

→ **_ProductOrder_**(<u>ItemID</u>†, <u>OrderNum</u>†, Quantity)