

# The Second Normal Form Design Review



Customer				
<u>CustomerID</u>	<u>EmployeeID</u>	CustomerName	CustomerCity	Population
C1000	1003	Ford	Dearborn	94000
C1010	1003	GM	Detroit	670000
C1020	1004	Dell	Austin	950000
C1030	1004	HP	Palo Alto	67000
C1040	1004	Apple	Cupertino	60000
C1050	1005	Boeing	Chicago	2700000

<u>EmployeeID</u>	First	Last	SalesOffice	OfficeNumber
1003	Mary	Smith	Chicago	312-555-1212
1004	John	Hunt	New York	212-555-1212
1005	Martin	Hap	Chicago	312-555-1212

# First Normal Form

# What is the Purpose of this Table?

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Customer				
<u>CustomerID</u>	<u>EmployeeID</u>	CustomerName	CustomerCity	Population
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C1010	1003	GM	Detroit	670000
C1020	1004	Dell	Austin	950000
C1030	1004	HP	Palo Alto	67000
C1040	1004	Apple	Cupertino	60000
C1050	1005	Boeing	Chicago	2700000

# How about this one?

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<b><u>EmployeeID</u></b>	<b>First</b>	<b>Last</b>	<b>SalesOffice</b>	<b>OfficeNumber</b>
1003	Mary	Smith	Chicago	312-555-1212
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C1050	1005	Boeing	Chicago	2700000

Tricky... These columns not dependent PK, as they aren't dependent on Employee ID

<u>EmployeeID</u>	First	Last	SalesOffice	OfficeNumber
1003	Mary	Smith	Chicago	312-555-1212
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These columns not dependent PK

# Issue with First Normal Form

# First Normal Form Design

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## SalesStaffInformation

EmployeeID

First

Last

SalesOffice

OfficeNumber

## Customer

CustomerID

EmployeeID (FK)

CustomerName

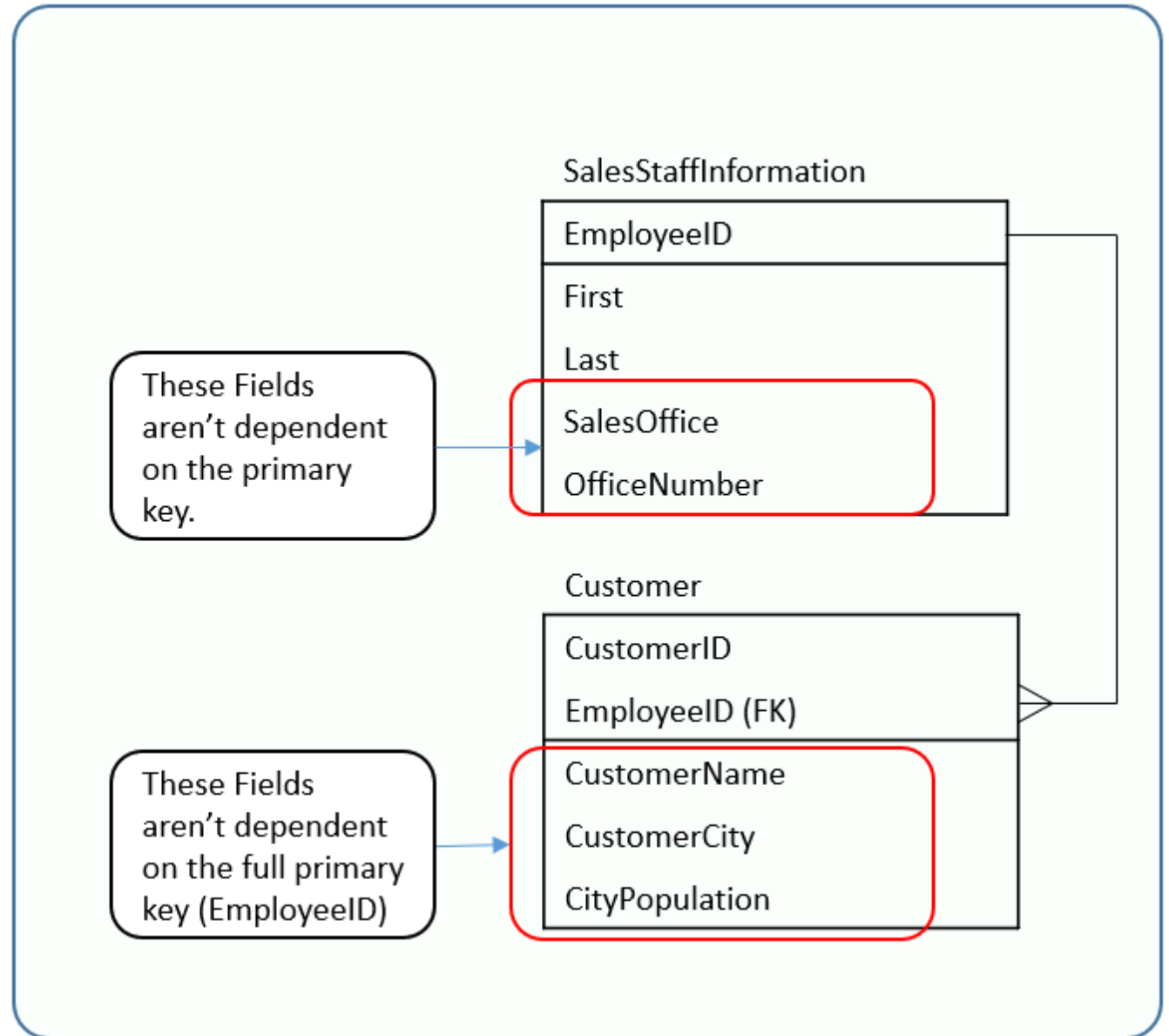
CustomerCity

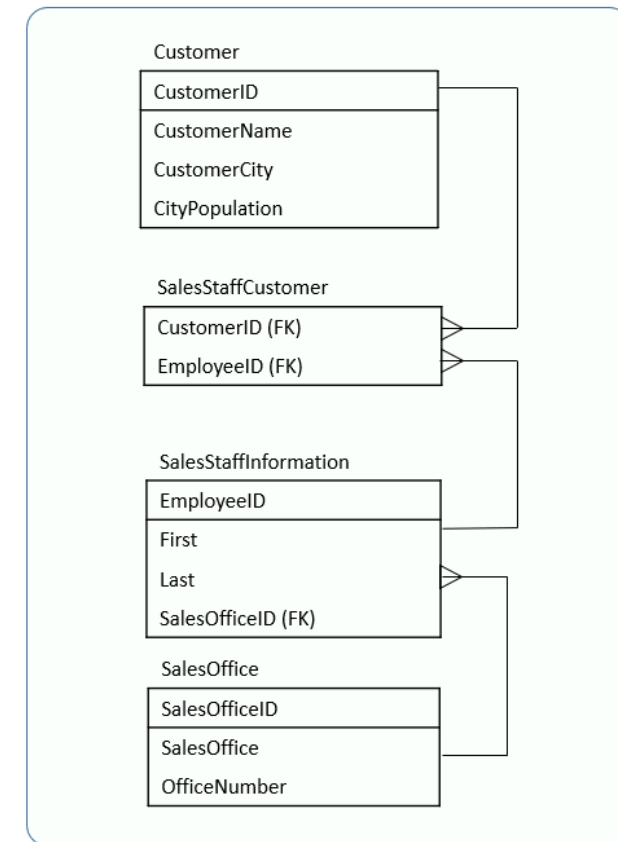
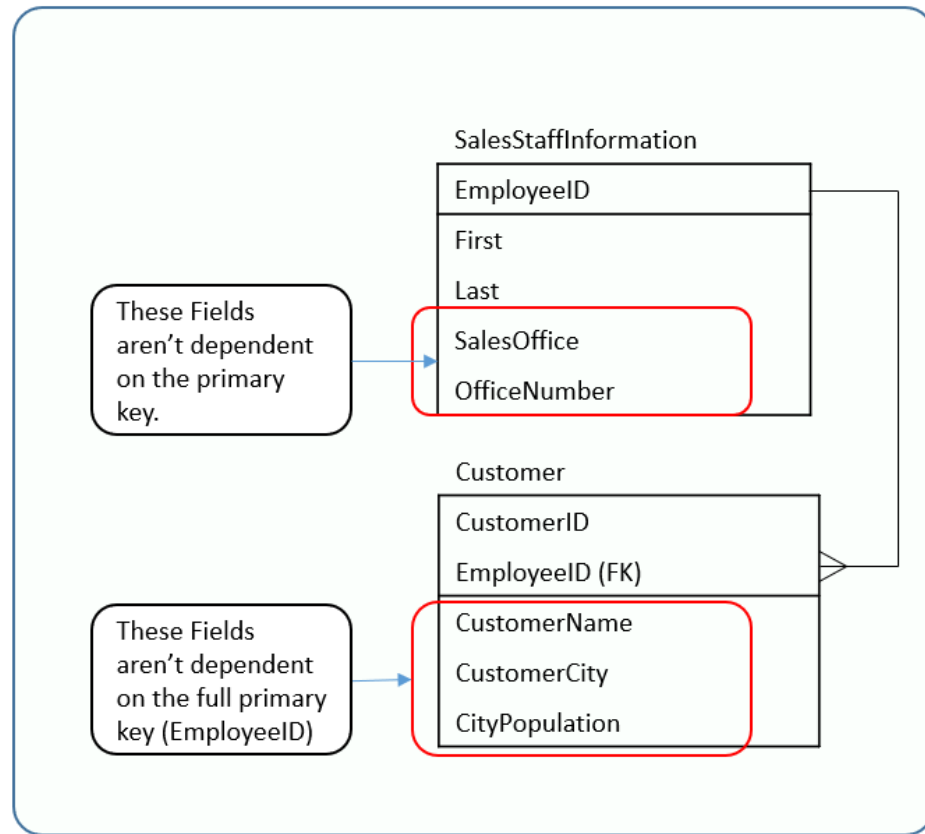
Population



# First Normal Form Design Issues

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# Second Normal Form Design

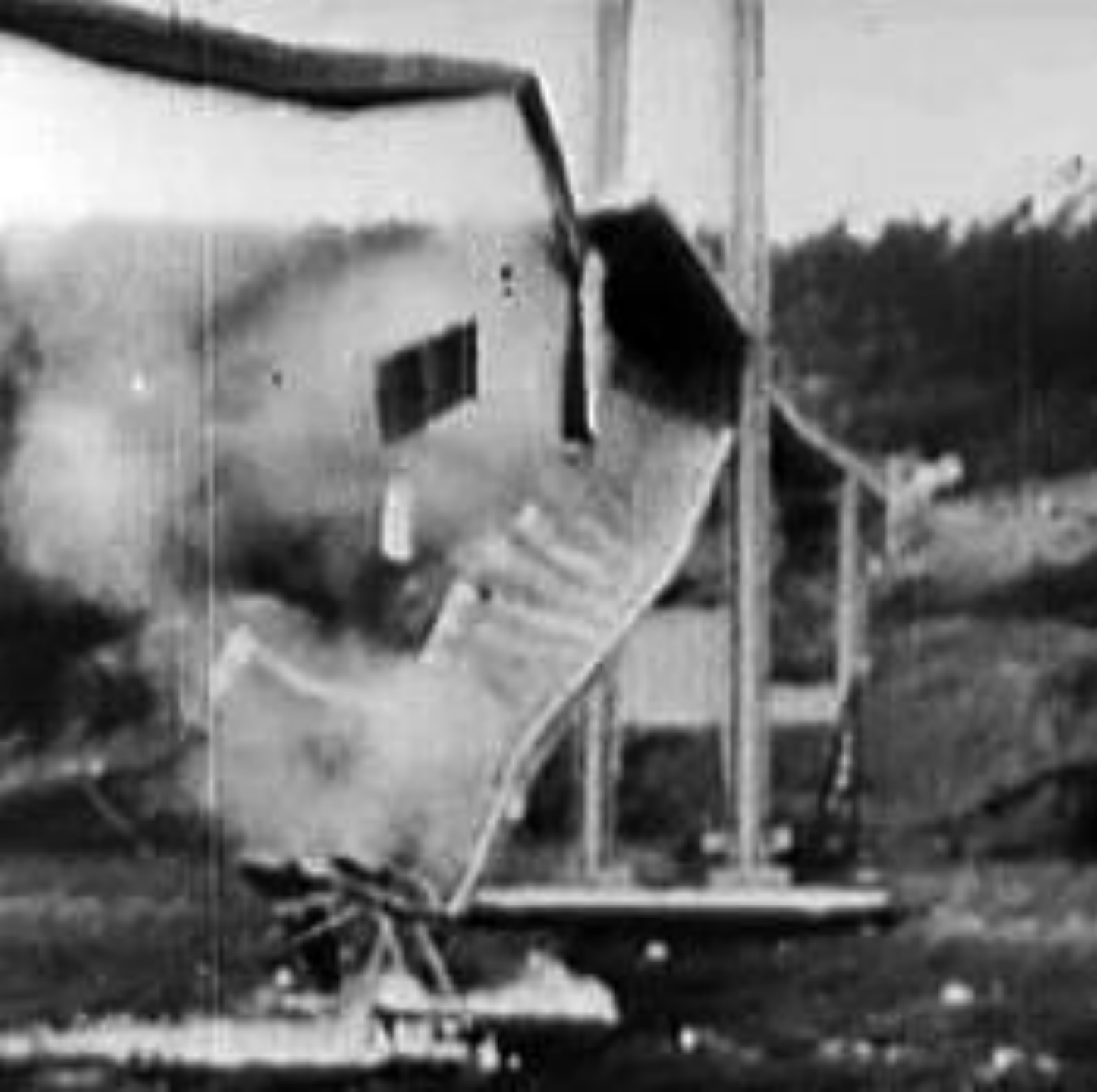


# Design Improvements

This design is superior to first normal form in several ways:

- Modification anomalies eliminated except in one table.





# Design Flaws

- Customer Table has an issue. The table isn't in third normal form.
- This has the potential to cause a data inconsistency.
- We'll tackle that next.