

Normalization Exercise 8

Normalization Exercise 8 - Design Document

UNF

HomeSales

Exercise Description:

- Refine the design to conform to the 3rd normal form and meet the following business rules and design requirement.

Business Rules:

- Track each sale of each home, including the selling price, closing date, selling agent, and buying agent.
- Assume there is only one selling agent and one buying agent for each sale.
- Assume only the last name of an agent is tracked.
- Assume only one phone number is tracked for an agent.
- Assume an agent is associated with only one real estate company.

Design Requirements:

- Use Crow's Foot Notation

*HomeID
Address
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyAddress
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyAddress
SellingPrice
ClosingDate
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyAddress
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyAddress
SellingPrice
ClosingDate

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HomeSales



Is there a good primary key?

*HomeID
Address
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyAddress
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyAddress
SellingPrice
ClosingDate
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyAddress
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyAddress
SellingPrice
ClosingDate

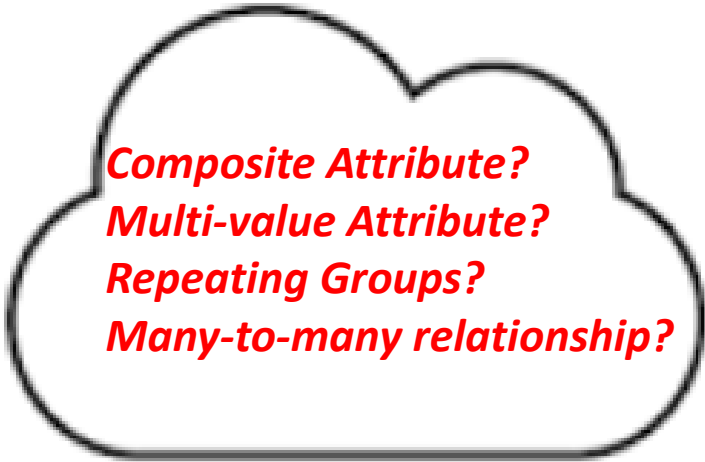
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HomeSales

*HomeID	
Address	
SellingAgentLastName	
sAgentPhoneNo	
sRealEstateCompany	
sCompanyAddress	
BuyingAgentLastName	
bAgentPhoneNo	
bRealEstateCompany	
bCompanyAddress	
SellingPrice	
*ClosingDate	
SellingAgentLastName	
sAgentPhoneNo	
sRealEstateCompany	
sCompanyAddress	
BuyingAgentLastName	
bAgentPhoneNo	
bRealEstateCompany	
bCompanyAddress	
SellingPrice	
ClosingDate	

Unnormalized Form (UNF)

Take to 1st NF



UNF HomeSales	
*HomeID	
Address	
SellingAgentLastName	
sAgentPhoneNo	
sRealEstateCompany	
sCompanyAddress	
BuyingAgentLastName	
bAgentPhoneNo	
bRealEstateCompany	
bCompanyAddress	
SellingPrice	
*ClosingDate	
SellingAgentLastName	
sAgentPhoneNo	
sRealEstateCompany	
sCompanyAddress	
BuyingAgentLastName	
bAgentPhoneNo	
bRealEstateCompany	
bCompanyAddress	
SellingPrice	
ClosingDate	

Unnormalized Form (UNF)

Take to 1st NF

UNF
HomeSales

Composite

*HomeID
Address
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyAddress
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyAddress
SellingPrice
*ClosingDate
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyAddress
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyAddress
SellingPrice
ClosingDate

Repeating
Groups

Corrected Composite Attributes and Repeating Groups Conform to 1st NF

Sales

*HomeID
StreetAddress
City
State
ZipCode
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyStreetAddress
sCompanyCity
sCompanyState
sCompanyZipCode
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyStreetAddress
bCompanyCity
bCompanyState
bCompanyZipCode
SellingPrice
*ClosingDate

Atomic



First Normal Form (1st NF)

Take to 2nd NF Next

Sales



Partial Dependency?

*HomeID
StreetAddress
City
State
ZipCode
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyStreetAddress
sCompanyCity
sCompanyState
sCompanyZipCode
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyStreetAddress
bCompanyCity
bCompanyState
bCompanyZipCode
SellingPrice
*ClosingDate

First Normal Form (1st NF)

Take to 2nd NF Next
Sales

*HomeID
StreetAddress
City
State
ZipCode
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyStreetAddress
sCompanyCity
sCompanyState
sCompanyZipCode
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyStreetAddress
bCompanyCity
bCompanyState
bCompanyZipCode
SellingPrice
*ClosingDate



Partial Dependency

Corrected Partial Dependency Conform to 2nd NF

Sales

Home	
*HomeID	
StreetAddress	
City	
State	
ZipCode	

New Entity



*HomeID
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyStreetAddress
sCompanyCity
sCompanyState
sCompanyZipCode
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyStreetAddress
bCompanyCity
bCompanyState
bCompanyZipCode
SellingPrice
*ClosingDate

Second Normal Form (2nd NF)

Take to 3rd NF Next

Transitive Dependency?

Home

*HomeID
StreetAddress
City
State
ZipCode

Sales

*HomeID
SellingAgentLastName
sAgentPhoneNo
sRealEstateCompany
sCompanyStreetAddress
sCompanyCity
sCompanyState
sCompanyZipCode
BuyingAgentLastName
bAgentPhoneNo
bRealEstateCompany
bCompanyStreetAddress
bCompanyCity
bCompanyState
bCompanyZipCode
SellingPrice
*ClosingDate

Second Normal Form (2nd NF)

Take to 3rd NF Next

Home	
*HomeID	
StreetAddress	
City	
State	
ZipCode	

Sales	
*HomeID	
SellingAgentLastName	
sAgentPhoneNo	
sRealEstateCompany	
sCompanyStreetAddress	
sCompanyCity	
sCompanyState	
sCompanyZipCode	
BuyingAgentLastName	
bAgentPhoneNo	
bRealEstateCompany	
bCompanyStreetAddress	
bCompanyCity	
bCompanyState	
bCompanyZipCode	
SellingPrice	
*ClosingDate	

Transitive Dependency

Corrected Transitive Dependency and Conform to 3rd NF

Agent	
*AgentID	
AgentLastName	
AgentPhoneNo	
RealEstateCompanyID	

New Entity

RealEstateCompany	
*RealEstateCompanyID	
RealEstateCompany	
CompanyStreetAddress	
CompanyCity	
CompanyState	
CompanyZipCode	

Sales	
*HomeID	
SellingAgentID	
saRealEstateCompanyID	
BuyingAgentID	
baRealEstateCompanyID	
SellingPrice	
*ClosingDate	

Home	
*HomeID	
StreetAddress	
City	
State	
ZipCode	

Done with Normalization

Agent

*AgentID
AgentLastName
AgentPhoneNo
RealEstateCompanyID

Sales

*HomeID
SellingAgentID
saRealEstateCompanyID
BuyingAgentID
baRealEstateCompanyID
SellingPrice
*ClosingDate

Home

*HomeID
StreetAddress
City
State
ZipCode

RealEstateCompany

*RealEstateCompanyID
RealEstateCompany
CompanyStreetAddress
CompanyCity
CompanyState
CompanyZipCode

What To Do Next?

- Create entities in Design Tool
- Don't add any additional entity or attribute
- Establish relationships between entities
- Pay attention to Multiplicity
- Pay attention to type of relationship
 - Identifying vs Non-Identifying
- Avoid unnecessary relationships
- Label PKs and FKs