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BNAI MIS 3504
Digital Design and Innovation Studio

UNDERSTANDING THE DATA YOUR CLIENT NEEDS

Day 5

Photo: Installation by Jenny Holzer, US Pavillion, Venice Biennale 1990

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Quiz until 9:00

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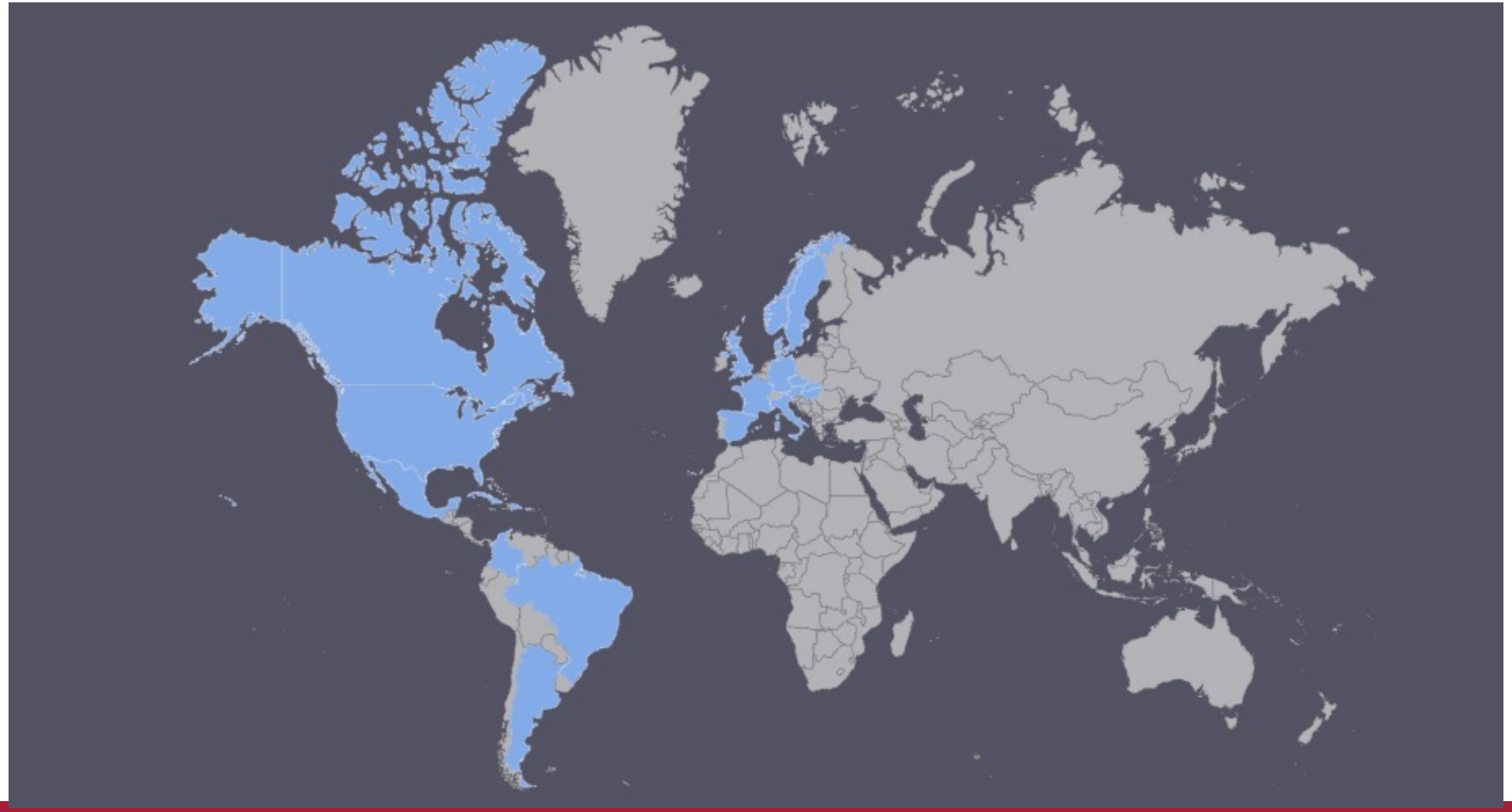
Quiz review

Days 2,3,4

Countries I Have Visited



Places in Your Country

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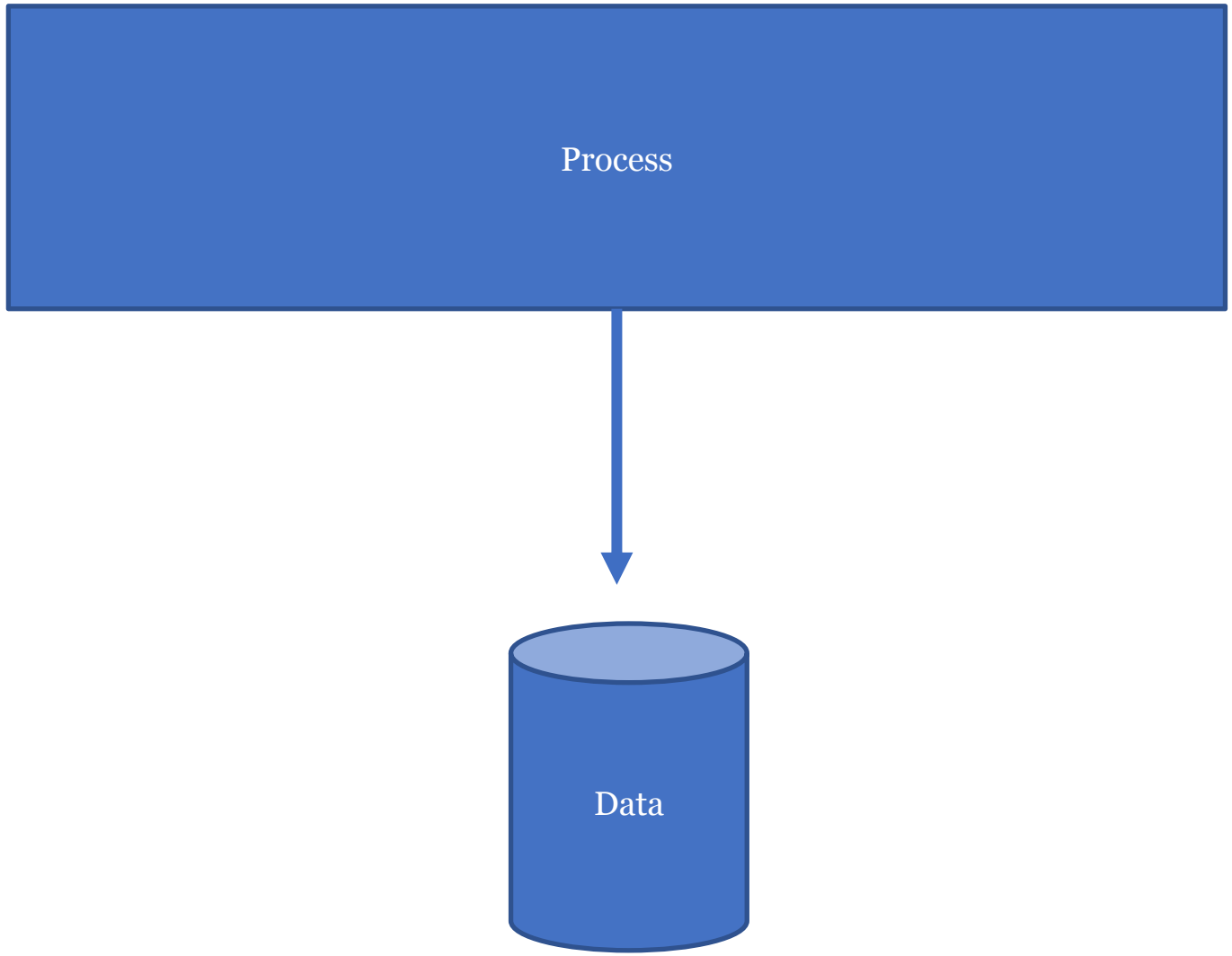
Review:

What are the Core Requirement Components?



How do you map it?

DATA

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Understanding DATA needed in a business context

What is DATA?

data:

1: factual information (as measurements or statistics) used as a basis for reasoning, discussion, or calculation <the *data* is plentiful and easily available — H. A. Gleason, Jr.> <comprehensive *data* on economic growth have been published — N. H. Jacoby>

2: information output by a sensing device or organ that includes both useful and irrelevant or redundant information and must be processed to be meaningful

3: information in numerical form that can be digitally transmitted or processed

from http://www.merriam-webster.com/dictionary/data

Build a Glossary of all the objects (nouns) that might be data with definitions

Term (NOUN)	Definition		
Tea	Herbs and spices put together to create a delicious warm drink.		
Cup	Container that holds the tea that the person can drink out of.		
Lemon	Additive to tea that is citrus		NOUNs: Person, place, or thing.
Water	Liquid used for brewing tea.		Courtney ~~cooks~~ tea ~~and drinks it.~~
Electricity	Enables the water to cook so that tea can be made.		
Sweetener	Component that makes the tea taste sweeter.		
Utensil	Tool that is used to stir the tea.		
teapot	Container that holds the water and tea and cooks it		

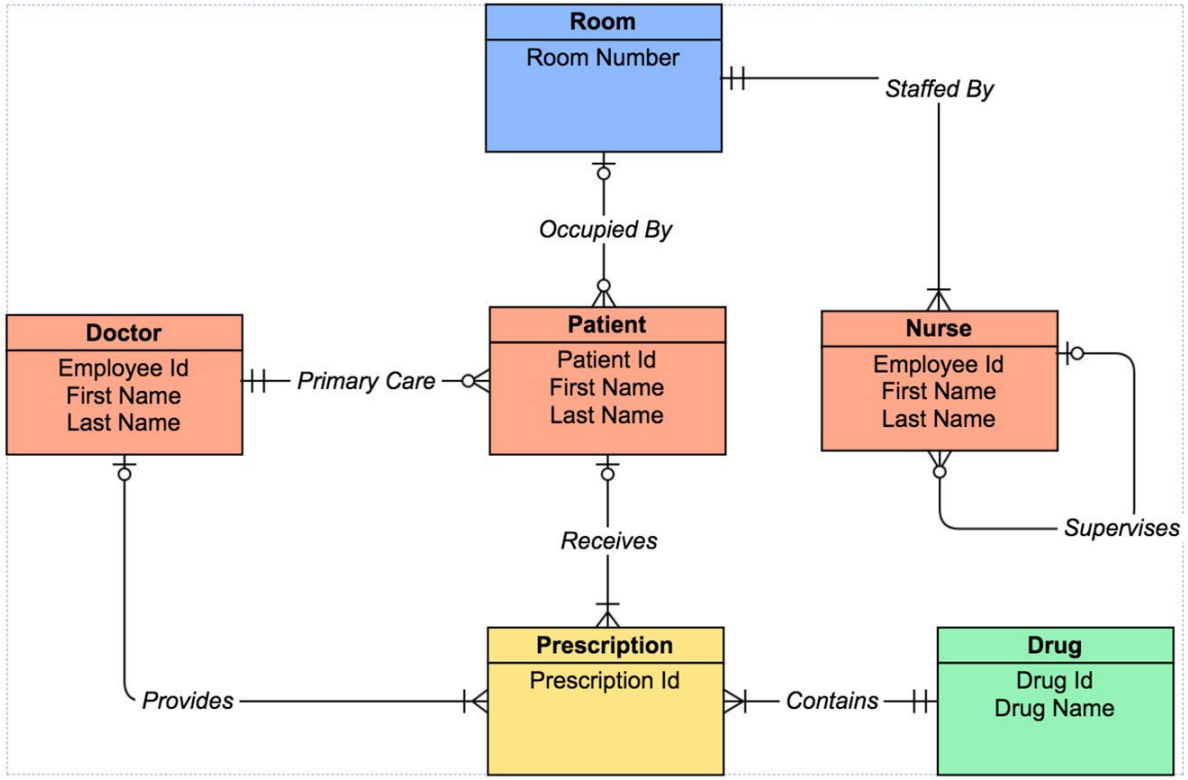
Defining Data

Once you have good definitions of key terms involved in your project you are done with data.

What other information might you want about your data?

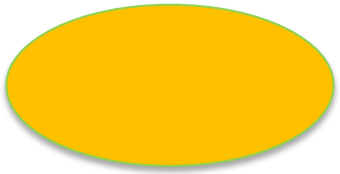
What is an Entity Relationship Diagram?

An Entity Relationship Diagram (ERD) is a visual representation of different data using conventions that describe how these data are related to each other.

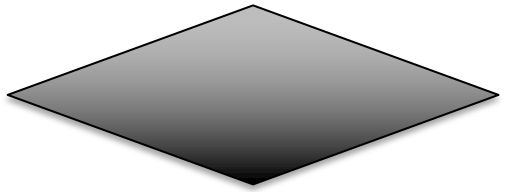


Primary ERD Symbols: Chen's Database Notation

- Entity = noun
  ex: shopper, item



- Attribute = adjective/characteristic
  ex: item price



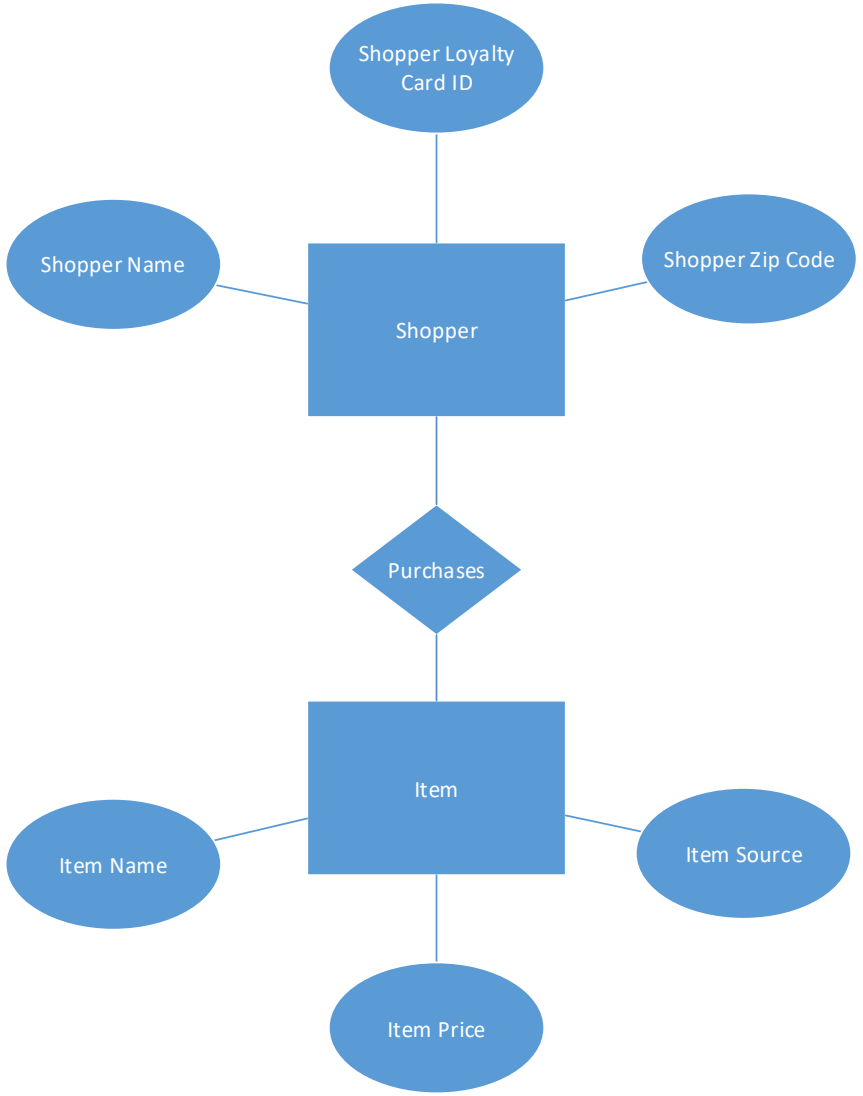
- Relationship = verb
  ex: buys

Translating

A shopper walks into a store to buy an item. When the shopper makes a purchase, the system is updated with information about the person, including their name, loyalty card id and zip code. The store also records which items were purchased, including details like item name, price and item source.

Entity Relationship Diagram

Chen's Database Notation



Entities

What is an entity?

Where would you look for them?

What might you want to know about them?

Attributes

What is an attribute?

Where would you look for them?

What might you want to know about them?

Relationships

What are the real world relationships between data entities?

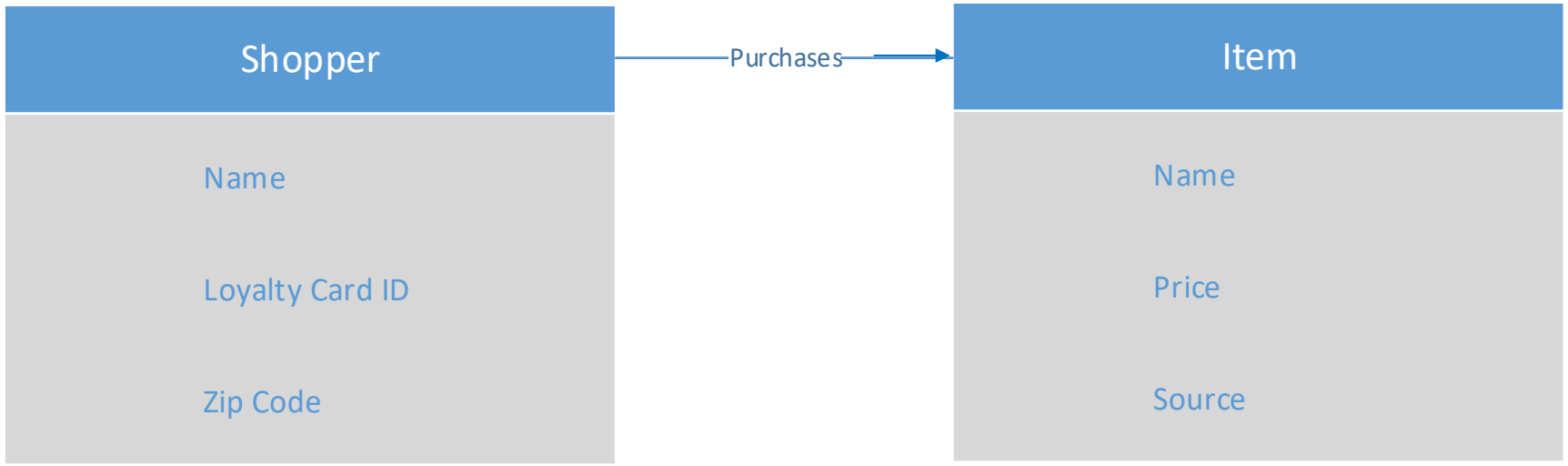
Try describing them in a sentence.

A customer places an order.

Translating

A shopper walks into a store to buy an item. When the shopper makes a purchase, the system is updated with information about the person, including their name, loyalty card id and zip code. The store also records which items were purchased, including details like item name, price and item source.

Entity Relationship Diagram: ERD tables



Crow's Foot Database Notation

Relationships (continued)

What is the cardinality of the relationship?

One to one

A Temple student has one TUID number and a TUID number identifies only one student.

One to many

A doctor sees many patients.

Many to many

A library has many books and a book can be in many libraries.

Cardinality in Data Modeling: Relationships

Cardinality describes a fundamental characteristic of the relationship between two entities.

- 1:1 = a one to one relationship
- 1:m = a one to many relationship
- m:m = a many to many relationship

Cardinality in Data Modeling: Relationships

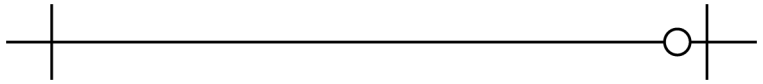
Below is an example of a 1:m relationship between *customer* and *transaction*.

These entities have a 1:m relationship because a customer can book multiple transactions, but a transaction belongs to one and only one customer.

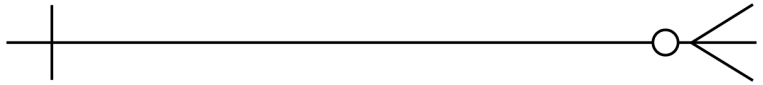
Cardinality in Data Modeling: Relationships

Crow's foot notation can include a little circle, indicating a null value. This means that the related entity is not mandatory.

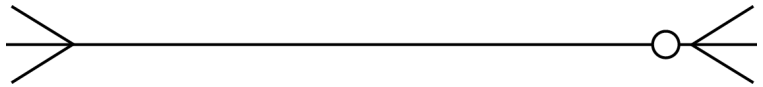
- 1:1 = a one to zero or one relationship



- 1:m = a one to zero or many relationship



- m:m = a many to zero or many relationship

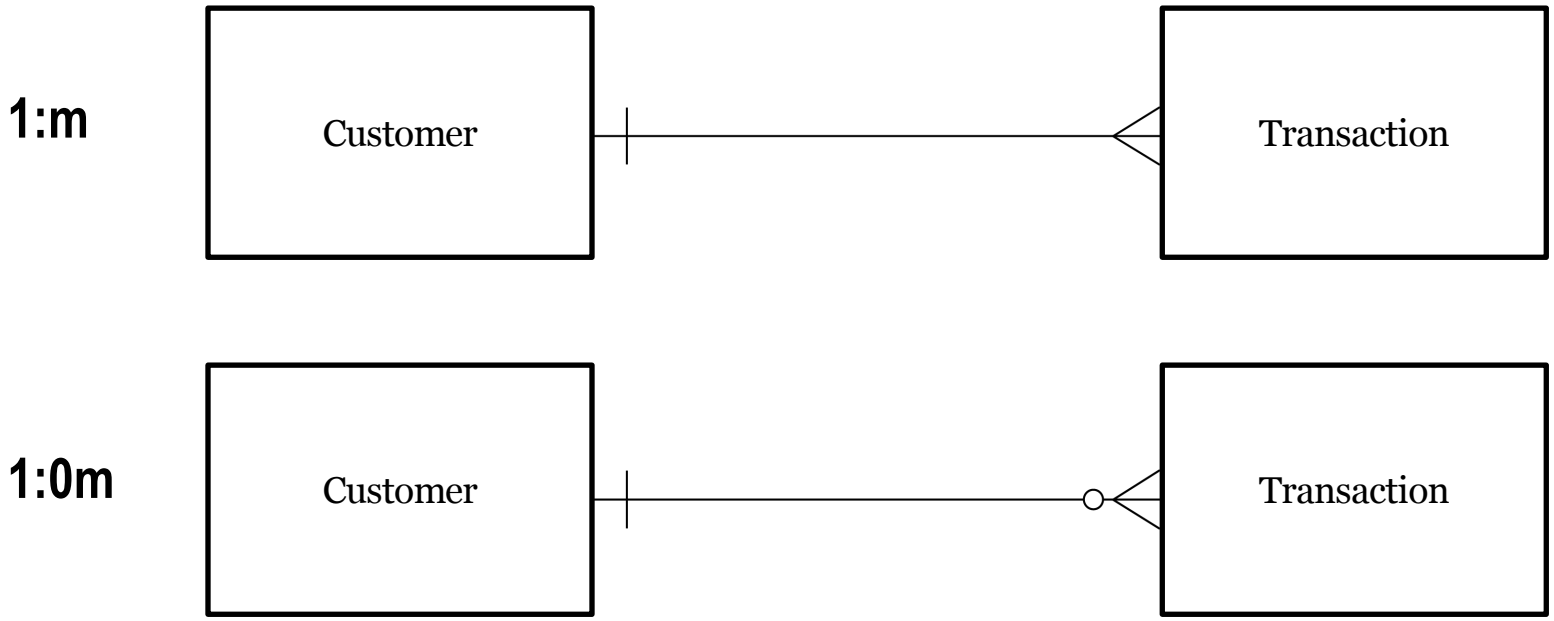


Cardinality in Data Modeling: Relationships

Let's review our example of the relationship between *customer* and *transaction*.

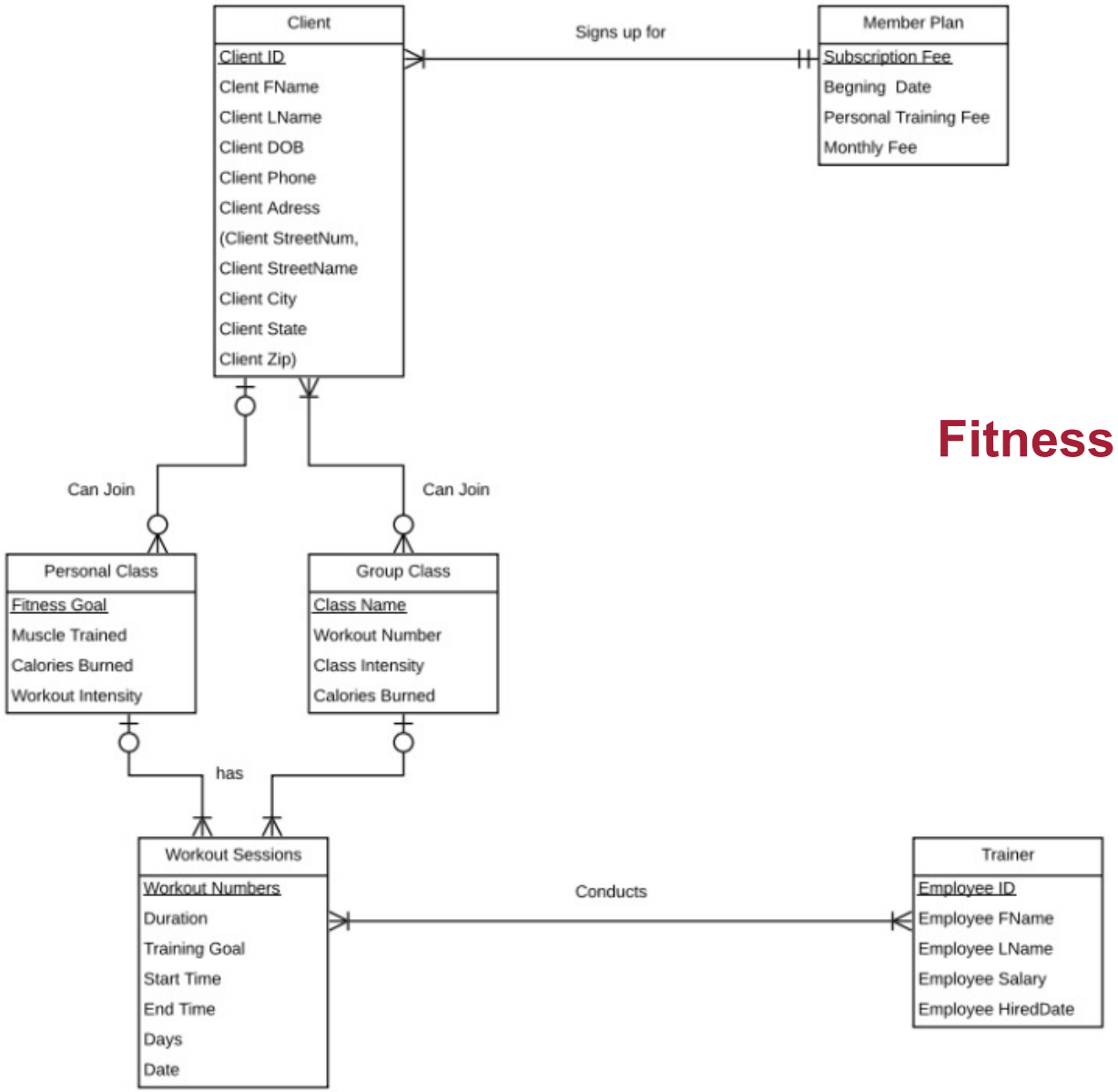
These entities now have a 1:0m relationship because a customer can book one, many, or zero transactions, but a transaction still belongs to one and only one customer.

Cardinality in Data Modeling: Recap



FITNESS CENTER ER DIAGRAM

The Organization modeled below displays a fitness center database system. Our fitness center consists of 7 employees and 1 primary location. We offer group classes and personal traning sessons to meet the needs all of our clients.



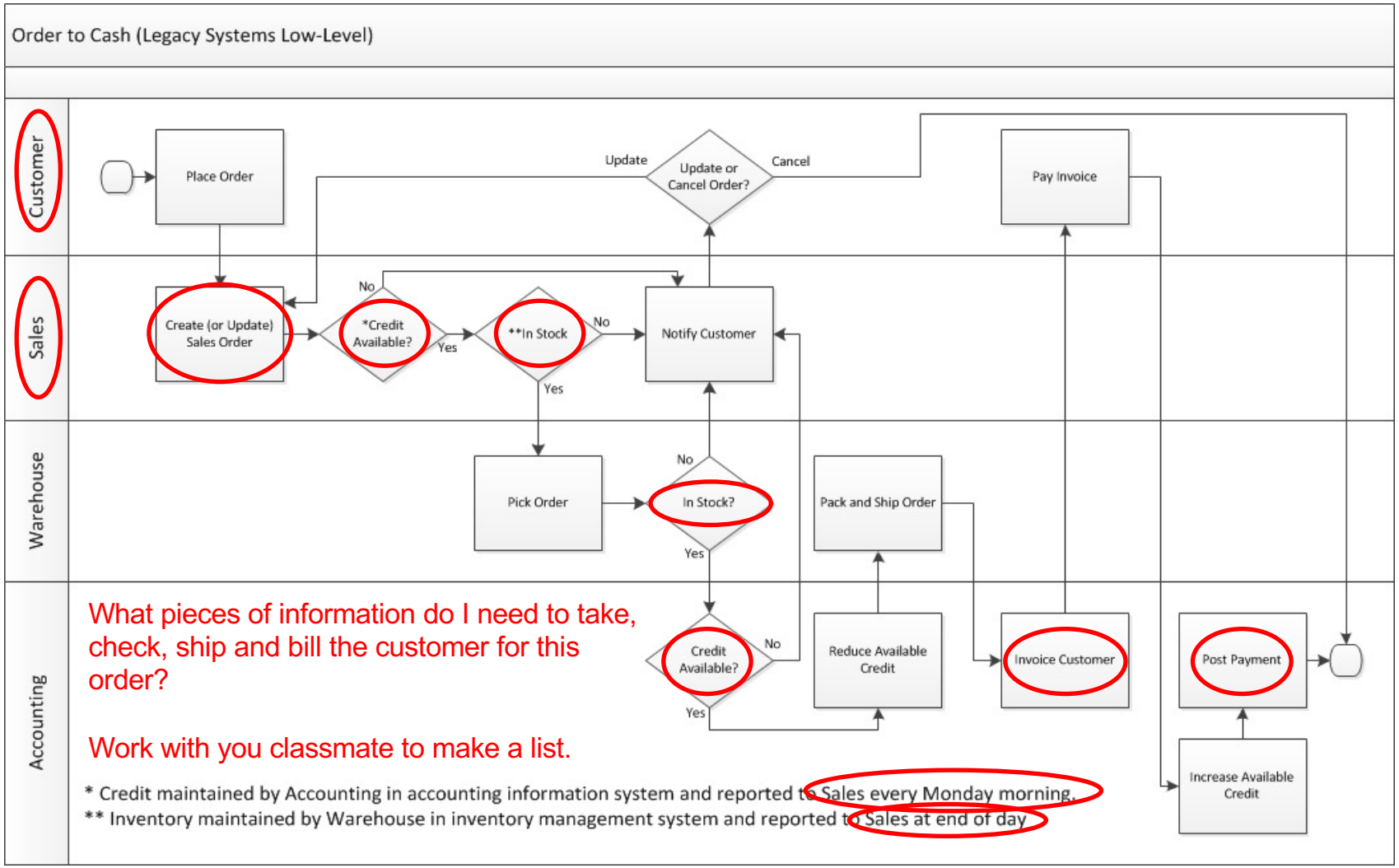
Fitness Center

Swim Lane Diagrams – Order to Cash (O2C)

The process starts when the customer contacts Sales to place an order. The person in Sales creates the sales order. As part of doing this, the person in sales first checks to see if the customer has enough available credit to cover the order. They do this by looking up the customer's credit on a report that is generated by Accounting and sent to Sales every Monday morning. If the customer doesn't have enough available credit, then the person in sales notifies the customer who can then either update or cancel their order. Next the person in sales checks to see if the items being ordered are in stock. They do this by checking a report on inventory that the Warehouse created at the end of each day. If the items being ordered are not in stock, then the person in Sales notifies the customer who can then update or cancel their order. If the report indicates the items are in stock, then the order goes to the Warehouse where the workers there will pick the order. Since Sales is looking at a report that is only updated at the end of each day, there is a chance that they accepted an order for an item that is not really in stock. If that is the case the Warehouse notifies Sales who then notifies the customer who can update or cancel their order…

Swim Lane Diagrams – Order to Cash (O2C)

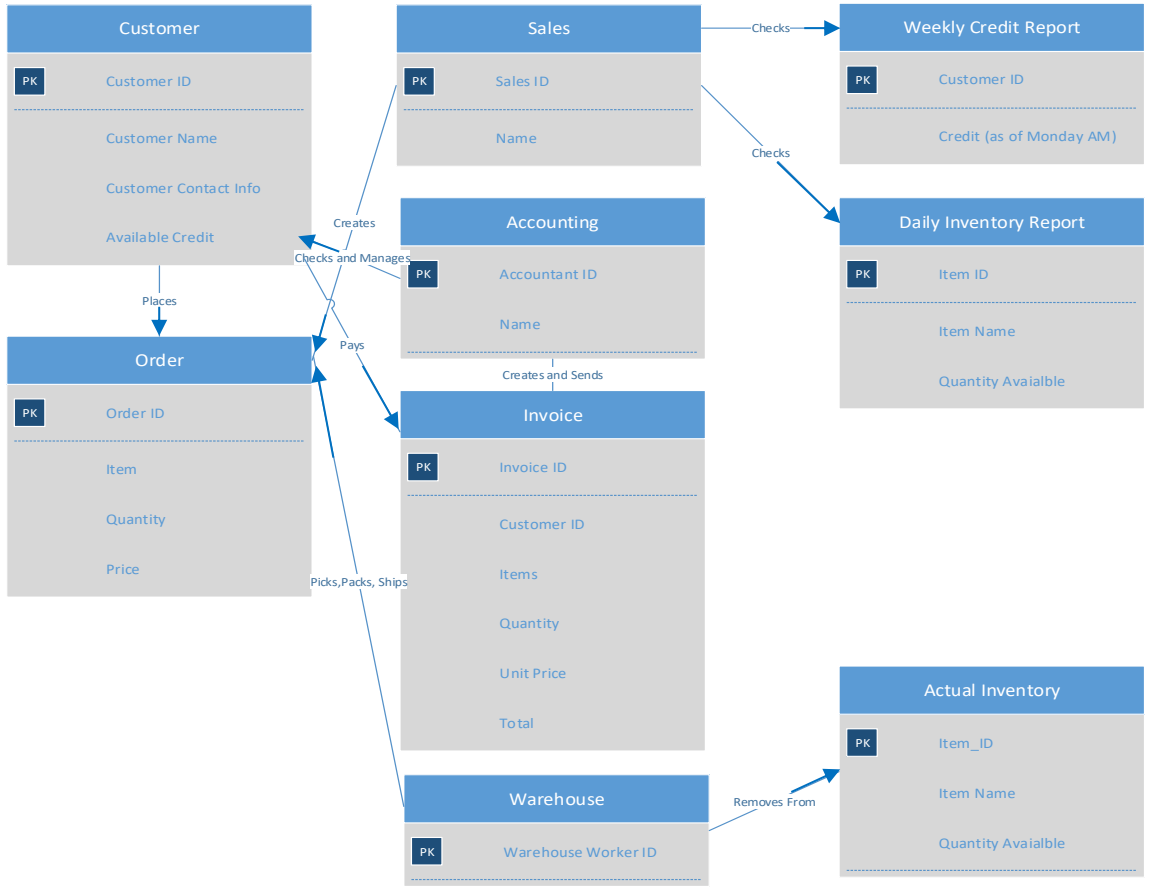
…Once the people in the warehouse pick the order, the people in Accounting have to make sure that the customer actually has enough credit to cover the order. Since the people in Sales use a credit report that is generated on Monday morning, there is a chance that the information on the credit report is old. If the customer doesn't have enough available credit, then Accounting notifies Sales who then notifies the customer who can then choose to update or cancel their order. If the customer has enough available credit, then their available credit is reduced by the total cost of the order and the warehouse is notified and they pack and ship the order. As soon as the order is shipped the people in the warehouse notify accounting and accounting generates and sends the invoice to the customer. When the customer pays the invoice the people in Accounting increase the customer's available credit by the amount of the payment, they post the payment and we're done.

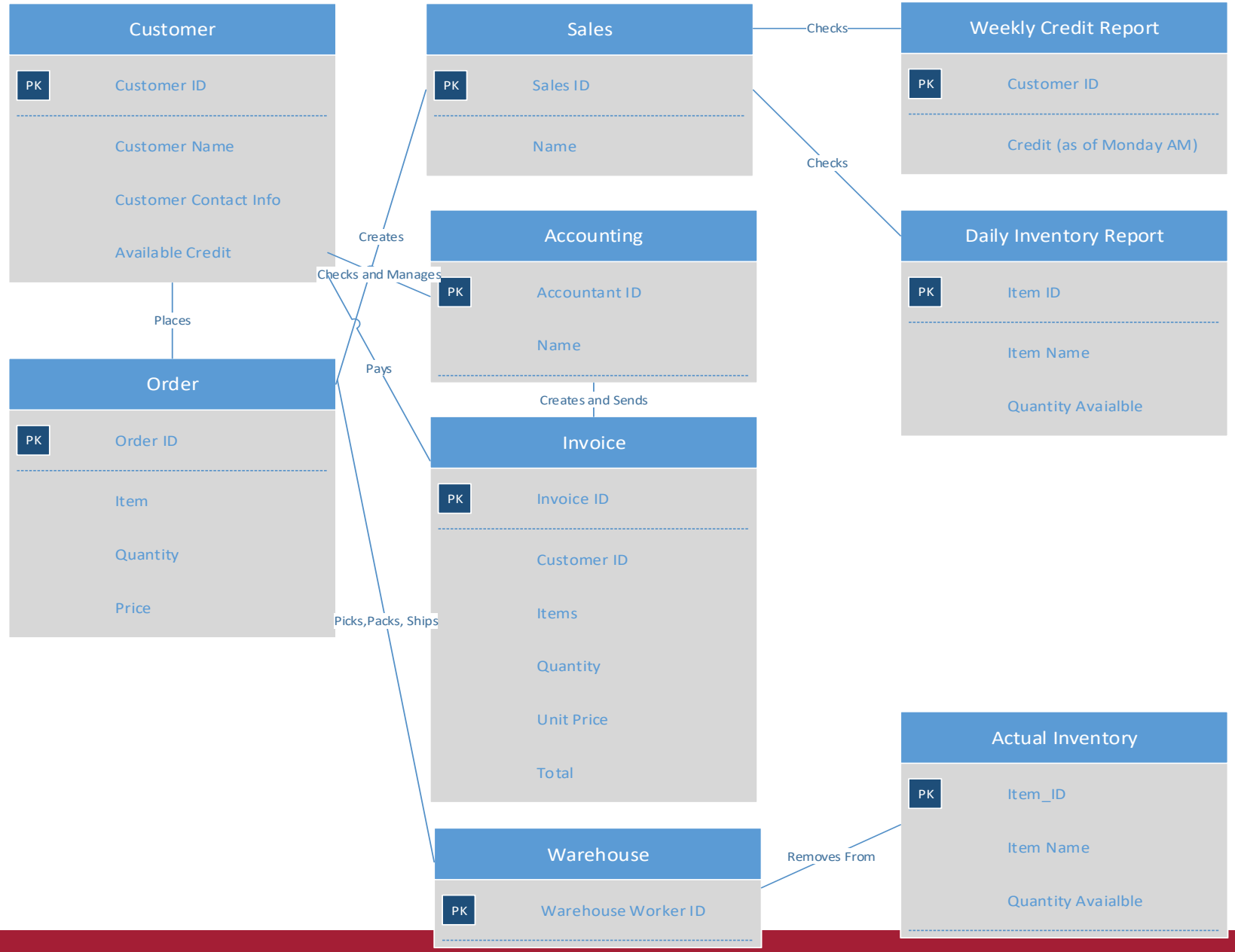

Order to Cash (Legacy Systems Low-Level)
Customer
Sales
Warehouse
Accounting
Place Order
Update
Update or Cancel Order?
Cancel
Pay Invoice
Create (or Update) Sales Order
No
*Credit Available?
Yes
**In Stock
No
Notify Customer
Yes
Pick Order
No
In Stock?
Yes
Pack and Ship Order
Credit Available?
No
Yes
Reduce Available Credit
Invoice Customer
Post Payment
Increase Available Credit
What pieces of information do I need to take, check, ship and bill the customer for this order?
Work with you classmate to make a list.
* Credit maintained by Accounting in accounting information system and reported to Sales every Monday morning.
** Inventory maintained by Warehouse in inventory management system and reported to Sales at end of day

ERD: tables

- Relationship, i.e. verb is written on the arrow
- Entity listed at the top of the table
- Attributes are listed under the entity

Legend :
- PK : Primary Key

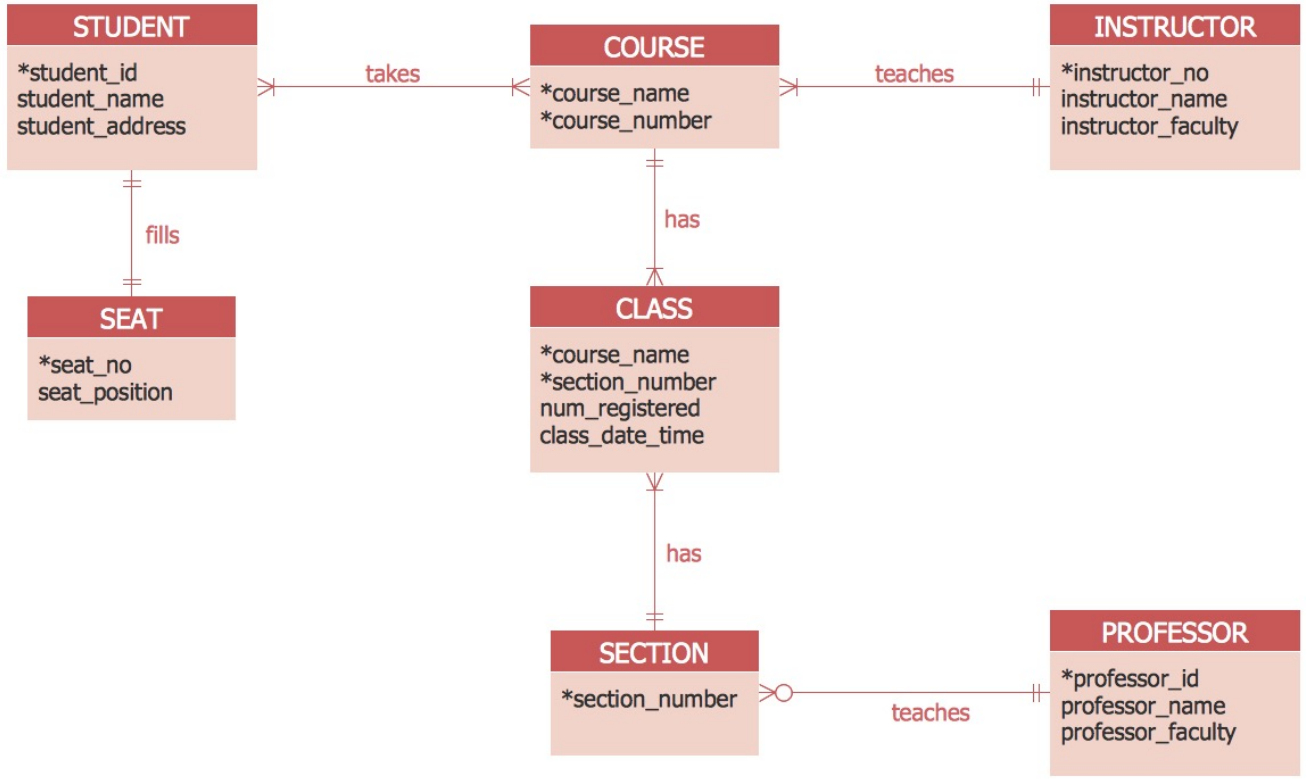



Customer
PK
Customer ID
Customer Name
Customer Contact Info
Available Credit
Sales
PK
Sales ID
Name
Checks
Weekly Credit Report
PK
Customer ID
Credit (as of Monday AM)
Checks
Daily Inventory Report
PK
Item ID
Item Name
Quantity Avaialble
Creates
Checks and Manages
Accounting
PK
Accountant ID
Name
Places
Pays
Creates and Sends
Order
PK
Order ID
Item
Quantity
Price
Invoice
PK
Invoice ID
Customer ID
Items
Quantity
Unit Price
Total
Picks,Packs, Ships
Warehouse
PK
Warehouse Worker ID
Removes From
Actual Inventory
PK
Item_ID
Item Name
Quantity Avaialble

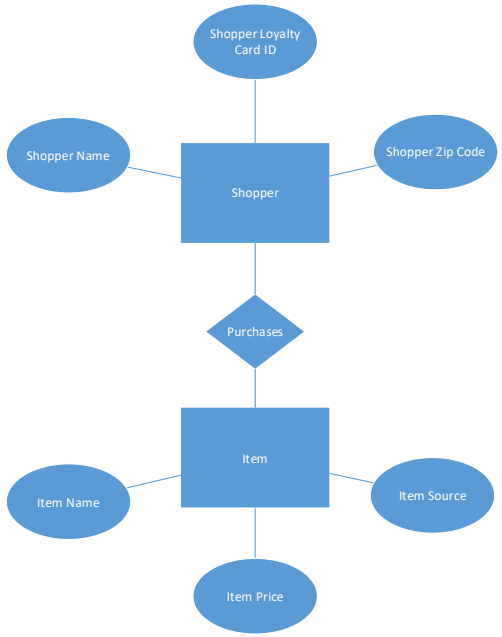
Entity Relationship Diagrams

Presents Entities, Attributes and Relationships visually

Used at different levels like logical and physical



Entity Relationship Diagram: Recap



Chen's Database Notation

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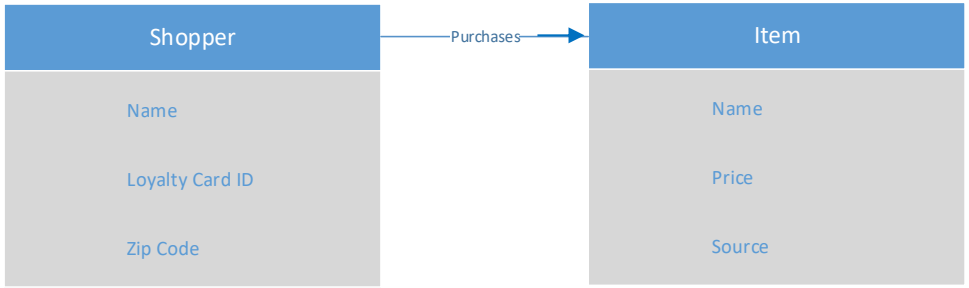
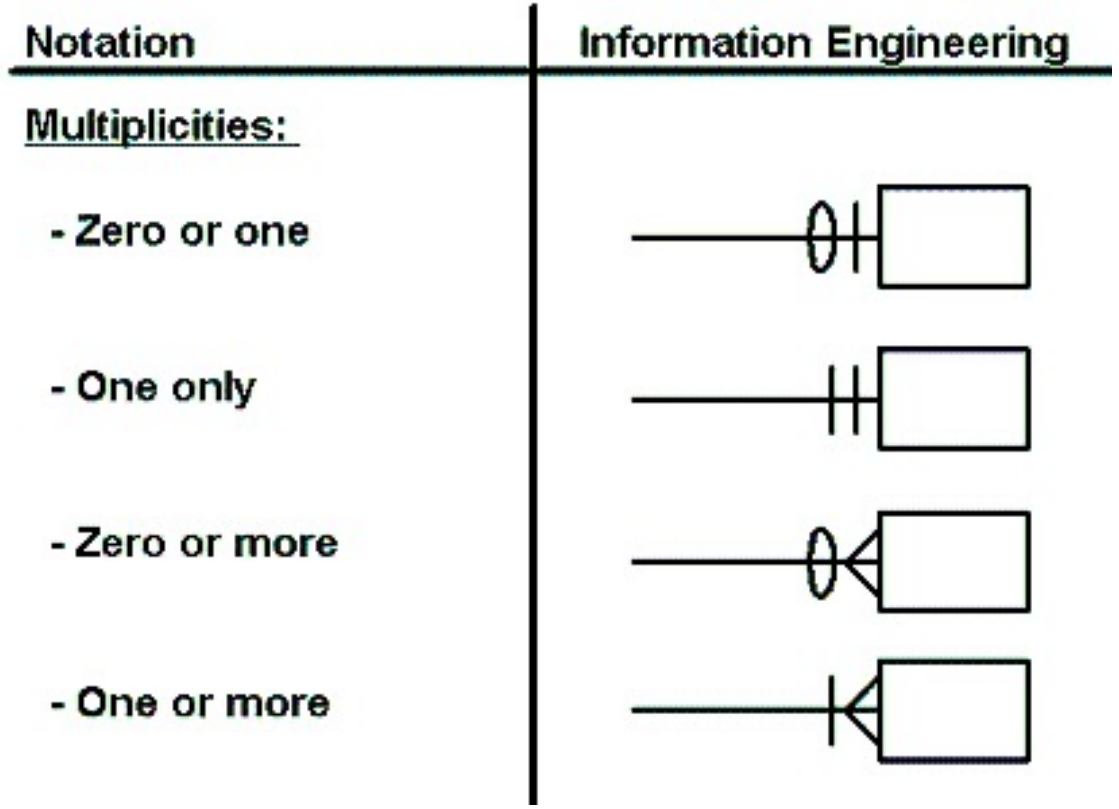


Crow's Foot Database Notation

Relationships (continued)

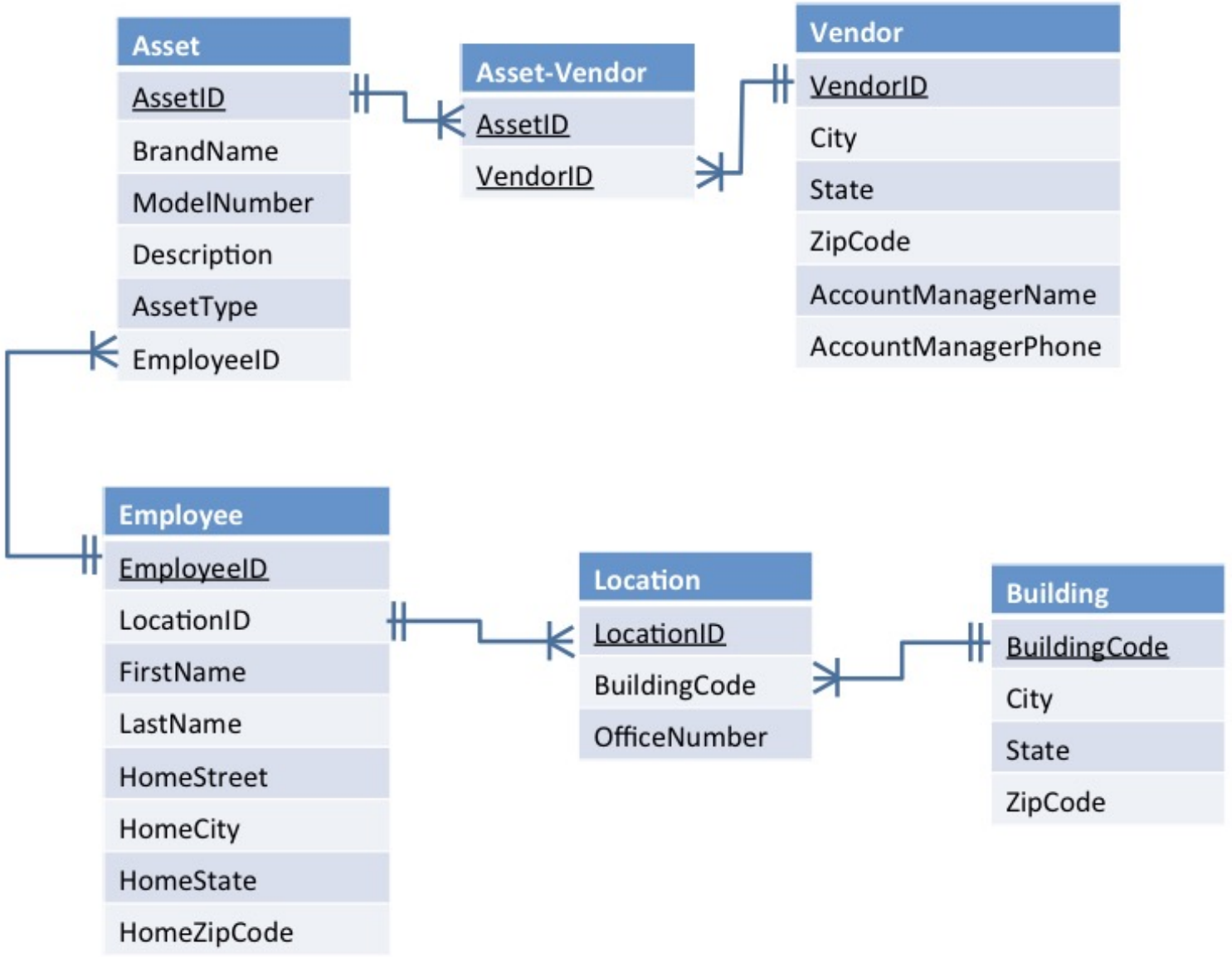
What is a entity relationship diagram (ERD)?

What relationship notation should you use?



Schema for Asset Management Database

(Assets are purchased from Vendors and assigned to Employees)



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Break 15 minutes

TEAM ACTIVITY

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Coco Music Productions Case

45 minutes

Coco Music Productions Case

Instructions:

Read through the case.
Work with your team.
45MINUTES:

- *Create a **glossary** of all the key concepts or information in the case.*
- *Create a list of the **entities.***
- *Create a list of the **attributes** for each entity.*
- *Using your list of entities, identify all the **relationships** between pairs of entities that you'll need.*

Share with the class

Case Review:

1. How did it go?
2. What confused you?
3. What does your list of entities, attributed and relationships look like?

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Case:

GLOSSARY: using the case, your personal experience and quick research, what are the key concepts and information needed by Coco Music Productions?

Write out a glossary of these terms

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Case:

ENTITIES: using your glossary, what are the entities needed by the Night Owl's application?

Write out a list of these entities.

How many do you have?

Are any related?

Entity

1) Ticket
2) Ticket Sale Person
3) Credit Card
4) Customer
5) Show

6) Anything else??
7) Customer Loyalty Database?
8) Website– is that how the students buy tickets?

Case:

ATTRIBUTES: using your list of entities, what are the attributes of each of your entities?

Write out a list of these entities.

How many do you have?

Are any related?

Attribute

- **Ticket**
  - **Ticket Cost**
  - **Show ID**
  - **Sale ID**
- **Show**
  - **Show ID**
  - **Show Name**
  - **Show Date**
  - **Show Time**
- **Ticket Sale Person**
  - **Sale Date**
  - **Sale Cost**
  - **Card Number**
  - **Sales Tax Collected?**
- **Credit Card**
  - **Card Number**
  - **Expiry Date**
  - **CSC Code**
  - **Card Holder Name**
- **Customer**
  - **Card Holder First Name**
  - **Card Holder Last Name**
  - **Email Address**
  - **Loyalty ID?**

Case:

Relationships: using your list of entities, what are the relationships between each of your entities?

Write a sentence to describe each relationship.

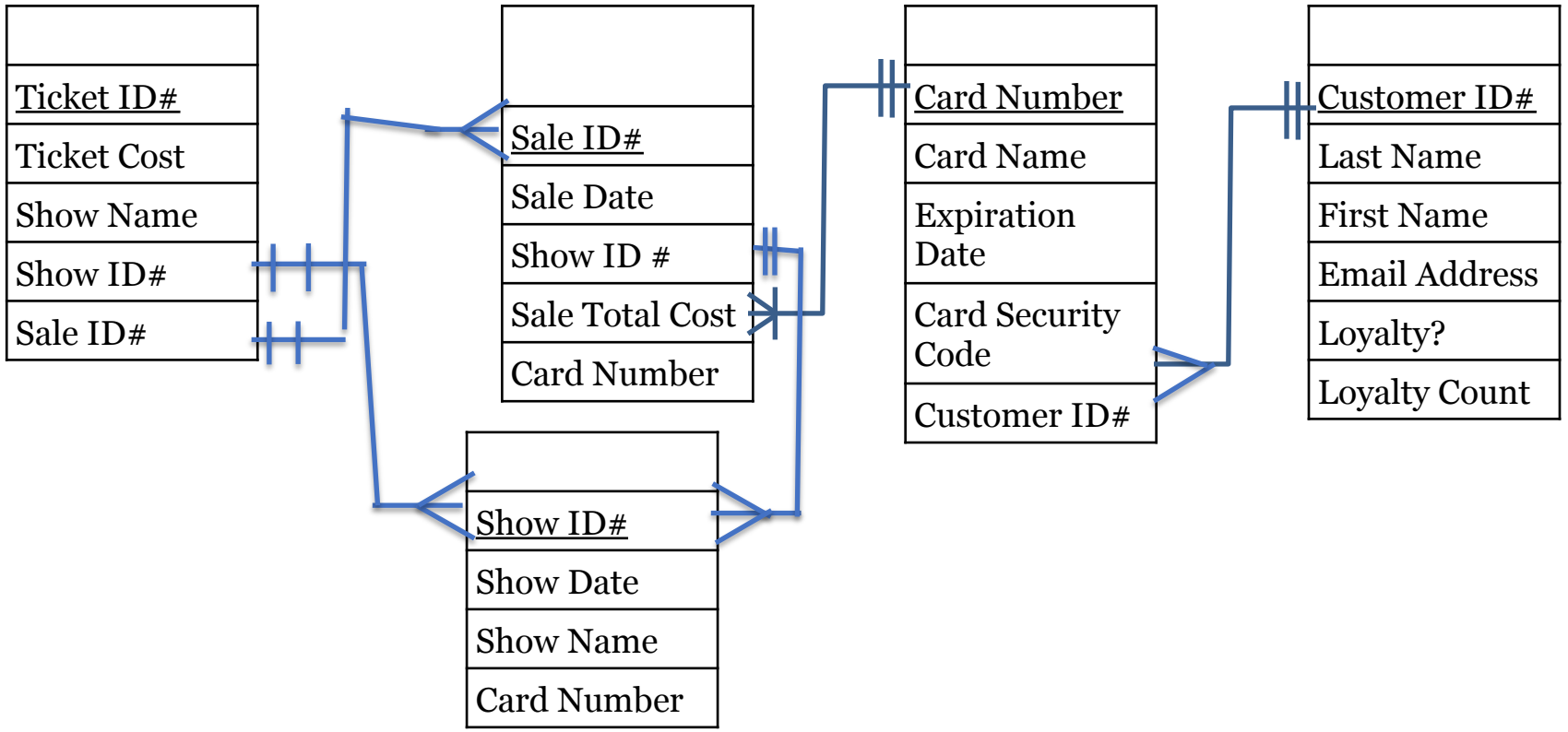
What are the cardinalities of the relationships?

Case Review:

1. How did it go?
2. What confused you?
3. What does your list of entities, attributed and relationships look like?
4. What follow-up questions do you have?
5. What problems or opportunities should you be looking for?

Schema for Coco Music Production Purchases

(Tickets are purchased by customers using credit cards)



DAY 5: TEAM ACTIVITY: ERD

Spend 50 minutes working on your team project's ERD

Reminder: quiz tomorrow.
Class tomorrow: 8:30AM
Class Saturday: 8:30AM
Final Exam Sunday: 8:30AM-9:30AM
Final Presentations: 9:30-12

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GOODBYE

再见