MIS 3504
Digital Design and Innovation

Entities and Data Elements

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

DATA

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

Defining Data

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

- What other information might you want about your data?

- Logical vs. Physical
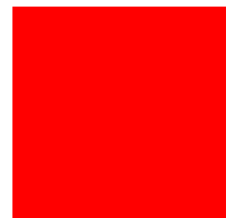
Steps to Defining Data

- Create a Glossary (list) of items that have been identified during requirements gathering and interviews
- From the glossary identify the Entities, *not all items in the list are considered to be entities*.
- Fill in the key Attributes (data elements) of the entities, *these may be on the glossary list as well*
- Identify Relationship between the entities, *they typically represent business rules*

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.
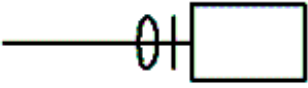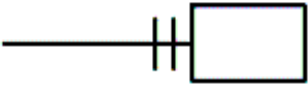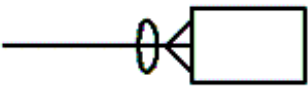 A customer places an order.
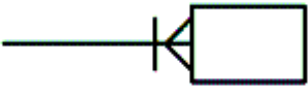
Relationships (continued)

- What is the multiplicity 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.

Relationships (continued)

- What is a data schema?

- What relationship notation should you use?

Notation	Information Engineering
Multiplicities:	
- Zero or one	
- One only	
- Zero or more	
- One or more	

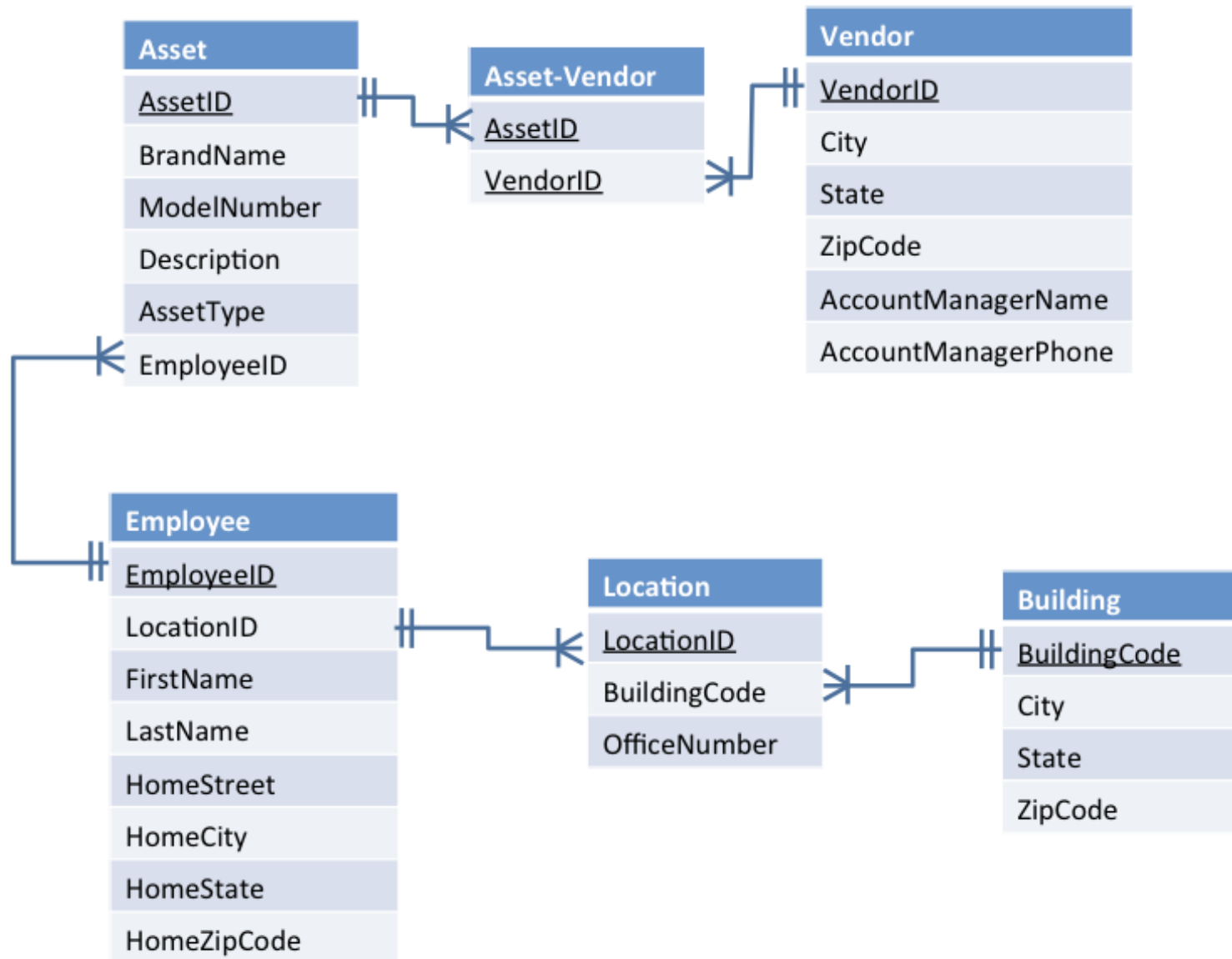# Schema for Asset Management Database
(Assets are purchased from Vendors and assigned to Employees)

Asset
- AssetID
- BrandName
- ModelNumber
- Description
- AssetType
- EmployeeID

Asset-Vendor
- AssetID
- VendorID

Vendor
- VendorID
- City
- State
- ZipCode
- AccountManagerName
- AccountManagerPhone

Employee
- EmployeeID
- LocationID
- FirstName
- LastName
- HomeStreet
- HomeCity
- HomeState
- HomeZipCode

Location
- LocationID
- BuildingCode
- OfficeNumber

Building
- BuildingCode
- City
- State
- ZipCode

Class Challenge:

The school is interested in implementing a course enrollment tracking solution that keeps track of the classes that student enroll in and the instructors that are teaching them.

Let walk through the process

GLOSSARY: using the case, your personal experience and quick research, what are the key concepts and information needed by the Course Tracking Solution?

Write out a glossary of these terms

Glossary: Results

- Students
- Instructors
- Grades
- Sections
- Class
- Start Time
- End Time
- Start Date
- End Date
- Meeting Day

Case: (15 minutes)

ENTITIES: using your glossary, what are the entities needed for the Solution?

Write out a list of these entities.
How many do you have?
Are any related?

ENTITIES: Results

- Classes

- Instructors

- Sections

- Registrations ???

- Students

Case: (15 minutes)

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?

Entity/Attributes: Results

Classes	Instructors	Sections	Registrations	Students
Class ID	Instructor ID	Section ID	Registration ID	Student ID
Class Title	First Name	Start Date	Student ID	First Name
Category	Last Name	Start Time	Section ID	Last Name
Credits	Street	Instuctor ID	Grade	Neighborhood
Description	Apt	Fee		Street
	City	Class Id		City
	State	Live Models		State
	zip	Meeting Day		zip
	Phone			Phone
				Birth Date
				Discount

Entity/Attributes: Results
(Justinmind tools)
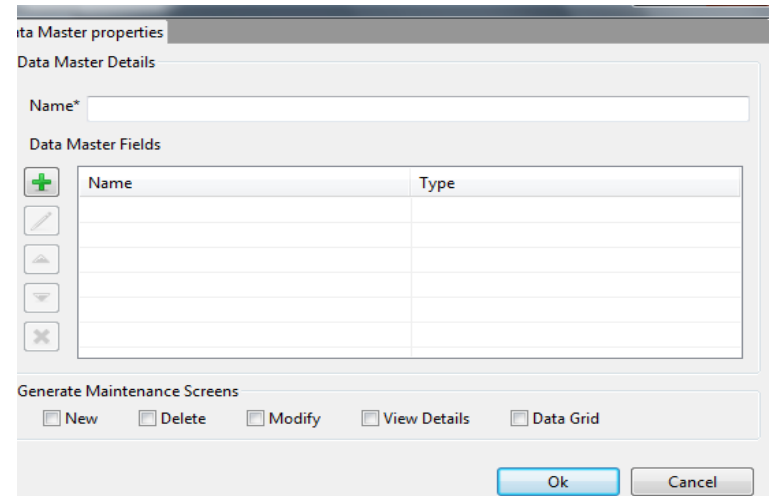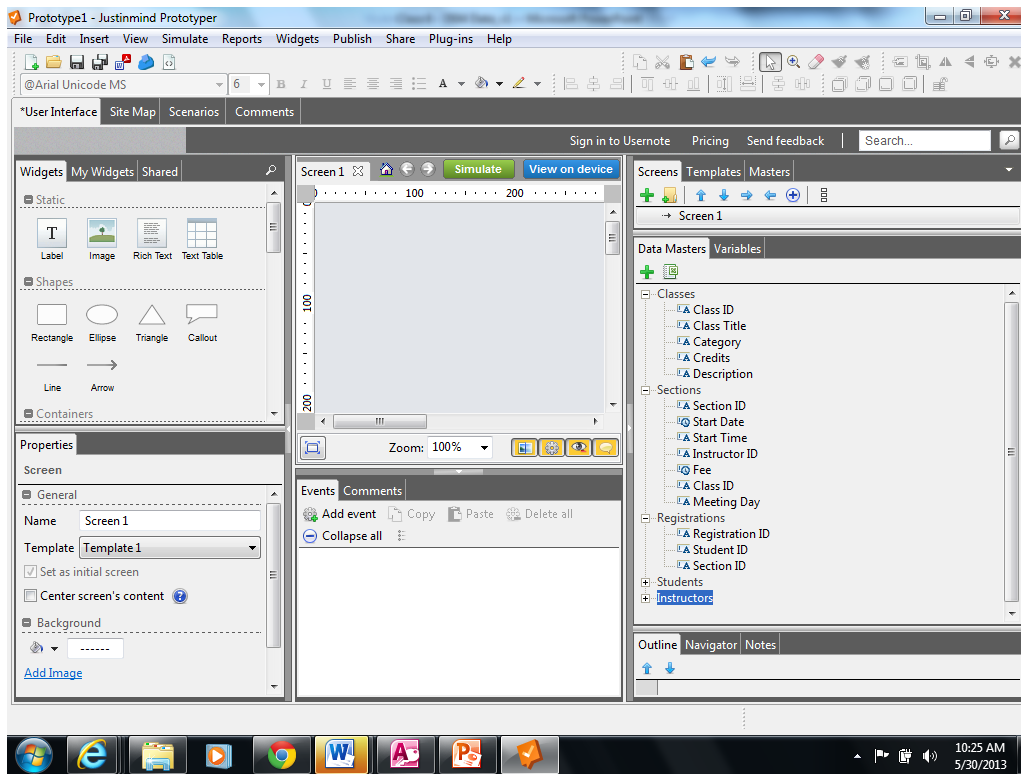
Entity/Attributes: Results
(Justinmind tools)

Data Masters

Name: Classes

Field Name	Type	Values
Class ID	text	[]
Class Title	text	[]
Category	text	[]
Credits	text	[]
Description	text	[]

Name: Instructors

Field Name	Type	Values
First Name	text	[]
Last Name	text	[]
Street	text	[]
Apt	text	[]
City	text	[]
Phone	text	[]

Name: Registrations

Field Name	Type	Values
Registration ID	text	[]
Student ID	text	[]

Case: (15 minutes)

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

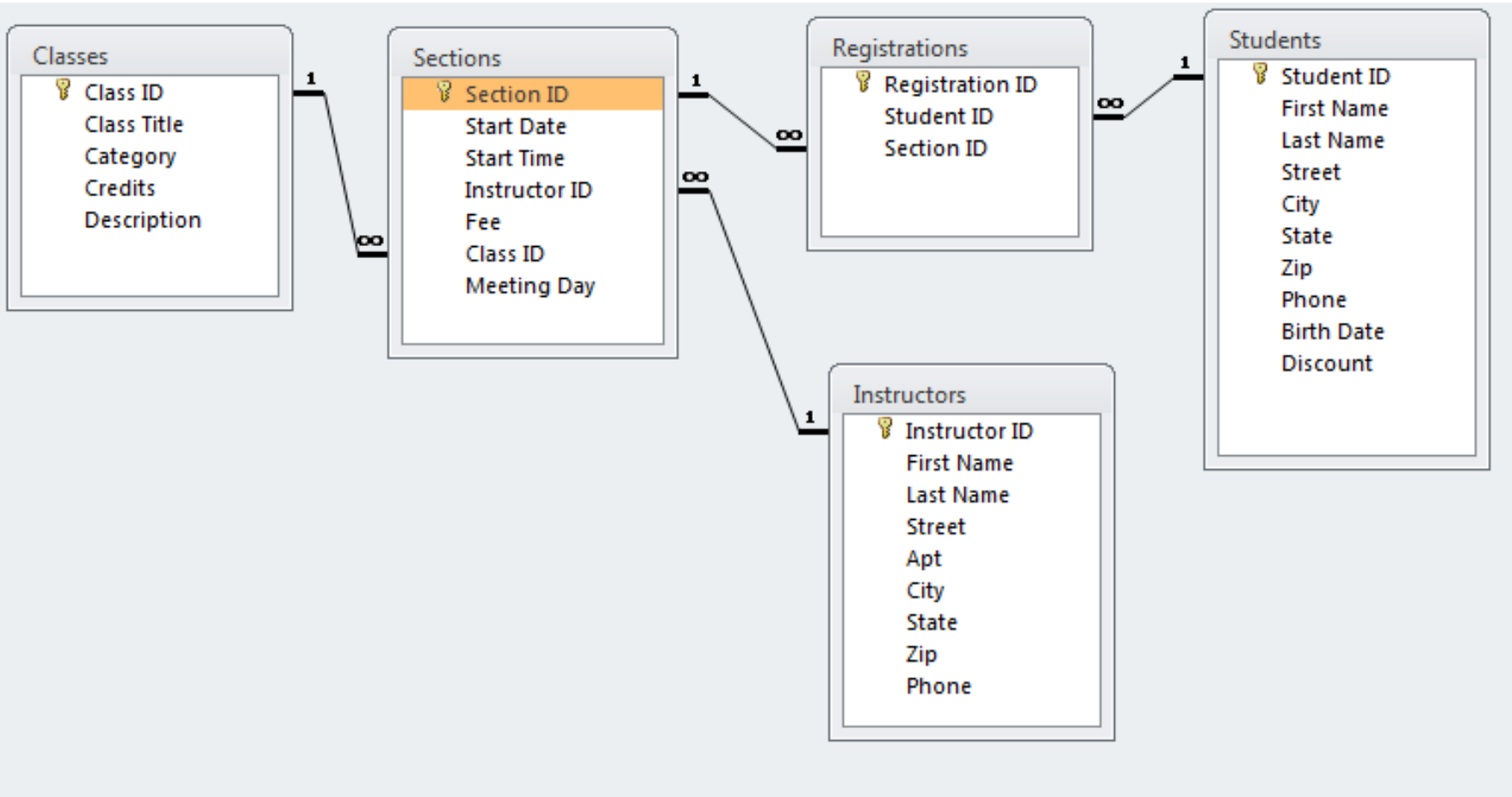Write a sentence to describe each relationship.

What are the multiplicities of the relationships?

Relationship: Results

- Students register for a class section
- Classes have multiple sections
- Students get a grade for specific class
- Instructors teach multiple class/sections
- A class can only have on primary instructor
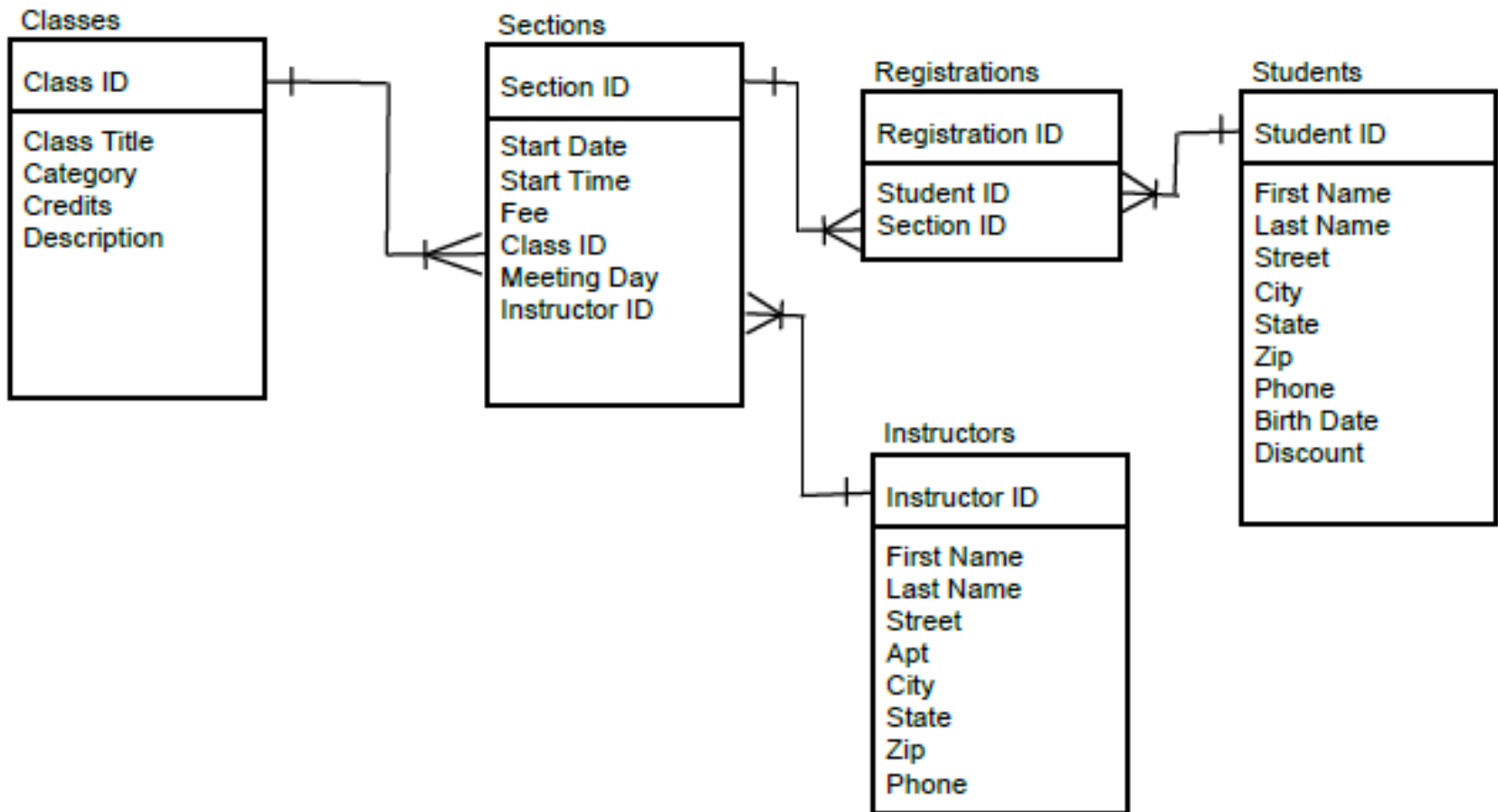- Students can register for many classes

Relationship: Results

(MS Access)

Relationship: Results
(Google Docs)

Student Class ER Diagram

Classes
- Class ID
- Class Title
- Category
- Credits
- Description

Sections
- Section ID
- Start Date
- Start Time
- Fee
- Class ID
- Meeting Day
- Instructor ID

Registrations
- Registration ID
- Student ID
- Section ID

Students
- Student ID
- First Name
- Last Name
- Street
- City
- State
- Zip
- Phone
- Birth Date
- Discount

Instructors
- Instructor ID
- First Name
- Last Name
- Street
- Apt
- City
- State
- Zip
- Phone

Challenge Review:

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

Data Evaluation

1. How well does the schema describe the data involved in the client's problem?
2. How completely does they cover the client's situation?
3. Does it accurately reflect what data the client is using?
4. Is it an appropriate tool for the client's situation?

Individual Challenge:

Night Owl Case Study
Due Class 7, March 19, 2014

Night Owl Case link
Google Doc ER Template
Excel Template

Night Owl Case Material

New Music Venue Case

You are working for the Night Owl, a new music venue located in North Philadelphia. The Night Owl wants to sell tickets to Temple students directly rather than through a service like Ticketmaster. You are part of the team defining the data requirements for their web service.

> *The Night Owl's plan is to take credit cards for payment and to create a customer loyalty program for those customers who want to take advantage of it. The customer loyalty program will track each visit the customer makes to Night Owl and will give them a free ticket to an upcoming show for every 10 tickets they buy. The Night Owl also wants to use the customers' email addresses to advertise upcoming shows.*

Your job is to define the logical data elements that must be kept for each customer in Night Owls' database.

Use what you know about credit card sales and customer loyalty programs to do the following:

The Deliverables:

Use the Excel Template Sample to:

1. Create a Glossary of terms from the case
2. Identify all the data entities that the Night Owl database will need.
3. For each entity, identify all of the attributes that must be collected. Include information about each entity's type, range if any, default value, and special requirements.
4. Indicate the relationships between the different entities.

Use the tool of your choice (Google docs, MS Access, Word, or Sketch on Paper) to create an ER Diagram

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

Write out a glossary of these terms

Step 2:

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?

Step 3:

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?

Step 4:

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 multiplicities of the relationships?

Develop an ER Diagram depicting the relationships