UNIVERSITY of HOUSTON

DEPARTMENT OF COMPUTER SCIENCE

COSC 3380 Spring 2024

Database Systems

M & W 4:00 to 5:30 PM

Prof. Victoria Hilford

PLEASE TURN your webcam ON (must have)

NO CHATTING during LECTURE

VH, UNHIDE SET 1 Sections 4 & 5

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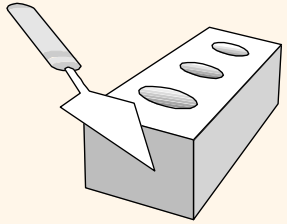

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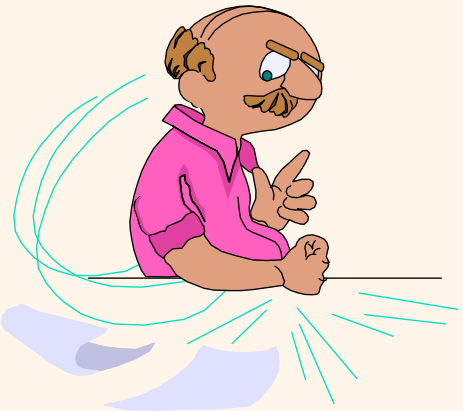

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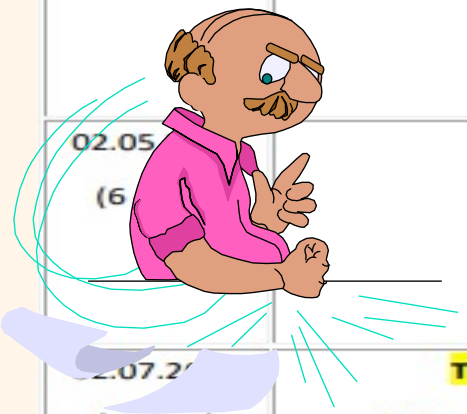
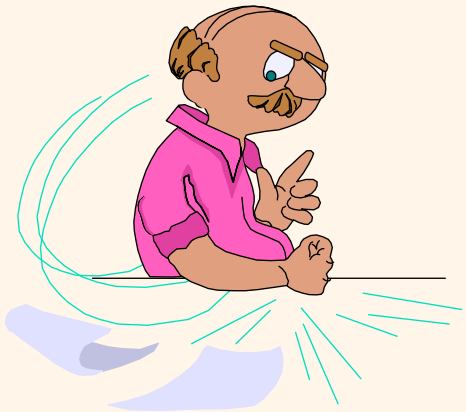
01.22.2024 (2 - Mo)	**ZyBook SET 1 - 2**	**Set 1** LECTURE 2 DATA MODELING - WHAT - ERD MODEL
01.24.2024 (3 - We)	**ZyBook SET 1 - 3**	**Set 1** LECTURE 3 DATA MODELING - HOW - RELATIONAL MODEL
01.29.2024 (4 - Mo)	**ZyBook SET 1 - 4**	**Set 1** LECTURE 4 ERD to RELATIONAL
01.31.2024 (5 - We)	**ZyBook SET 1 - 5**	**Set 1** LECTURE 5 NORMALIZATION
02.05 (6		**EXAM 1 Practice** **(PART of 20 points)**
.07.2 (7 - We)	**TA Download** **ZyBook SET 1 Sections** **(4 PM)** **(PART of 30 points)**	**EXAM 1 Review** **(PART of 20 points)**
02.12.2024 (8 - Mo)		**EXAM 1** **(PART of 50 points)**

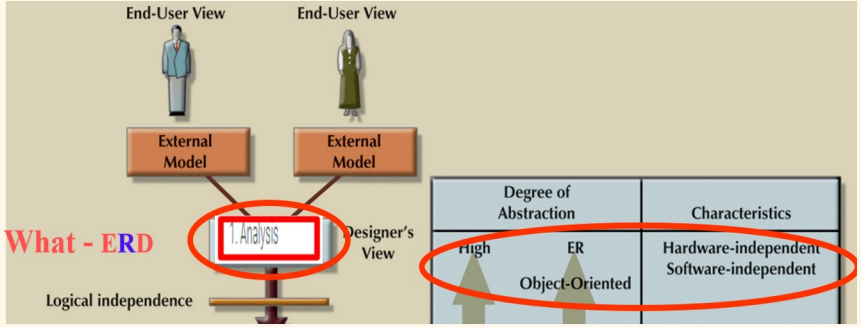




COSC 3380

Class 2

01.22.2024 (2 - Mo)	ZyBook SET 1 - 2	Set 1 LECTURE 2 DATA MODELING - WHAT - ERD MODEL



From 4:03 to 4:13 PM – 10 minutes.

01.22.2024 (2 - Mo)	ZyBook SET 1 - 2	Set 1
		LECTURE 2 DATA MODELING - WHAT - ERD MODEL

CLASS PARTICIPATION 20 points — 20% of Total

I AM IN TEAMS

Class 2 BEGIN PARTICIPATION

Not available until Jan 22 at 4:00pm | Due Jan 22 at 4:10pm | 100 pts

VH, publish

This is an synchronous online class.

Attendance is required.

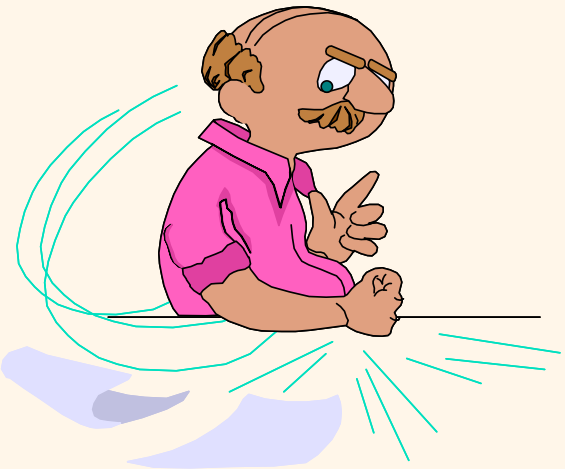
Recording or distribution of class materials is prohibited.

1. At the beginning of selected classes there is an **assessment in the first 10 minutes**. (**beige** BOX in the Detailed Syllabus)
2. At the end of selected classes there is an **assessment in the last 10 minutes**. (**blue** BOX in the Detailed Syllabus)
3. ZyBook sections will be downloaded and used for 30% of Total Score on the dates specified in the Detailed Syllabus.
4. EXAMS are in CANVAS. **No late EXAMS**.

From 4:10 to 5:00 PM – 50 minutes.

Lecture 2

Data Modeling – WHAT - The Entity Relationship Diagram Model



University Enterprise

- Requirements
- ER Diagram

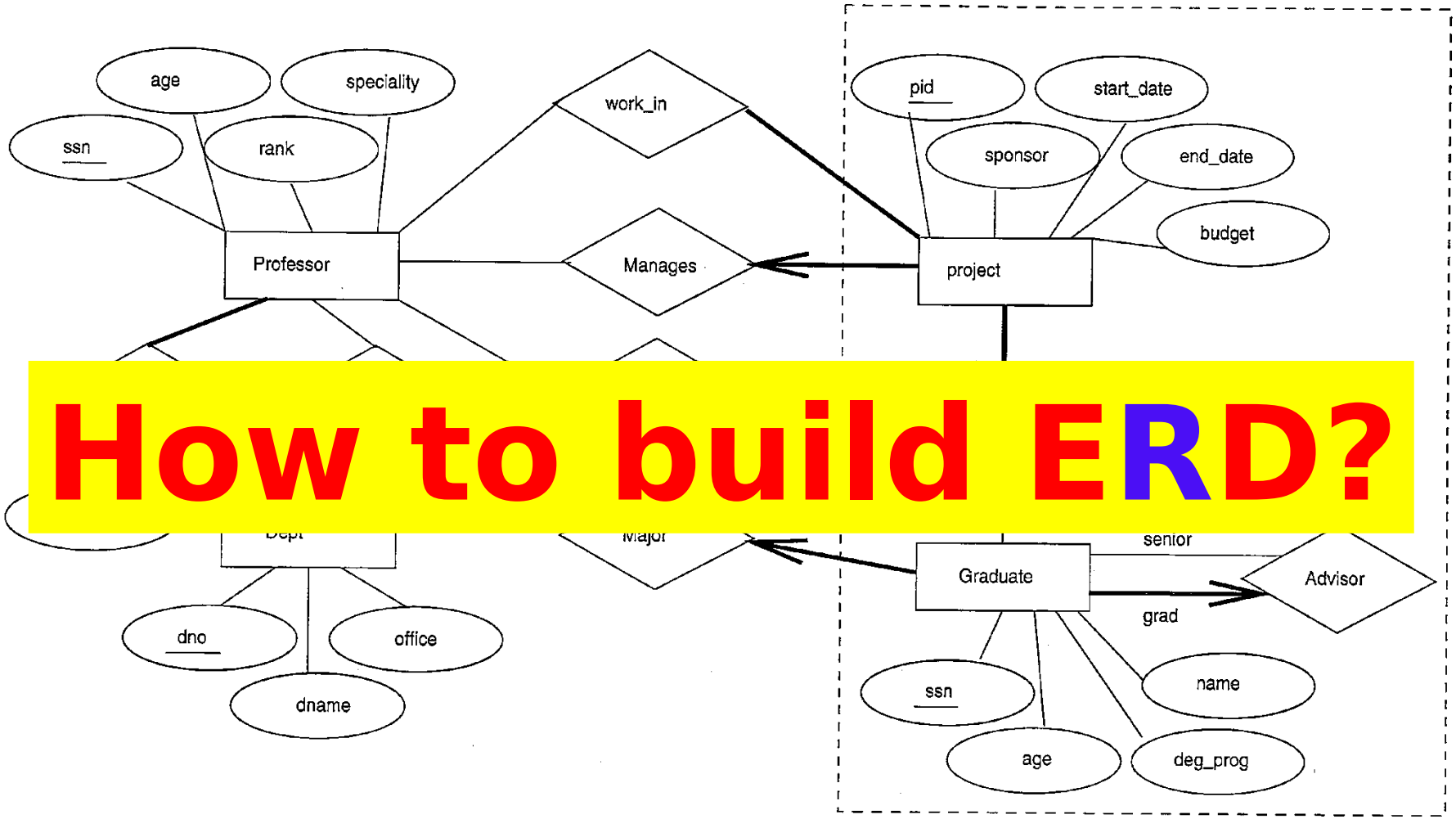
University Enterprise **Data** Requirements

Exercise 2.3 Consider the following information about a university database:

- Professors have an SSN, a name, an age, a rank, and a research specialty.
- Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date, and a budget.
- Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S. or Ph.D.).
- Each project is managed by one professor (known as the project's principal investigator).
- Each project is worked on by one or more professors (known as the project's co-investigators).
- Professors can manage and/or work on multiple projects.
- Each project is worked on by one or more graduate students (known as the project's research assistants).
- When graduate students work on a project, a professor must supervise their work on the project. Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one.
- Departments have a department number, a department name, and a main office.
- Departments have a professor (known as the chairman) who runs the department.
- Professors work in one or more departments, and for each department that they work in, a time percentage is associated with their job.
- Graduate students have one major department in which they are working on their degree.
- Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take.

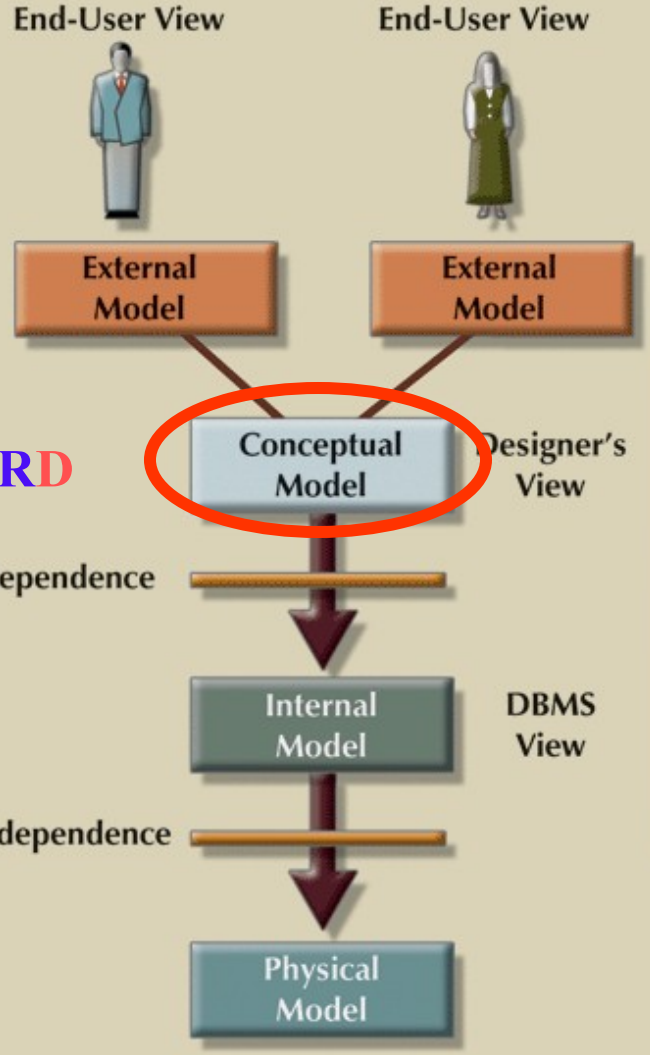
University Enterprise

ERD – WHAT **Data**



How to build ERD?

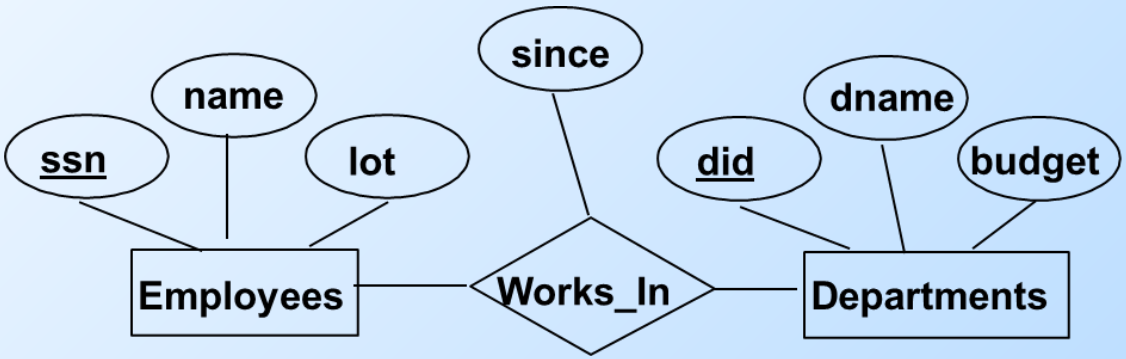
Data abstraction levels

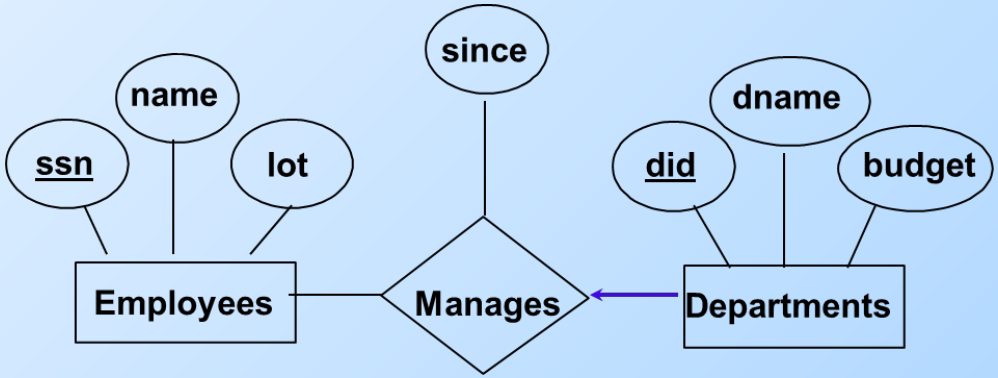


Degree of Abstraction		Characteristics
High	ER Object-Oriented	Hardware-independent Software-independent
Medium	Relational	Hardware-independent Software-dependent
Low	Network Hierarchical	Hardware-dependent Software-dependent

When **WHAT Data** Modeling

1. **MUST:** **Domain/Textual Analysis** on Data **Requirement**
2. **MUST:** USE the ***BELOW*** **ERD** Language





Database 1 Case Study
Data Requirements

XYZ Marketing Agency wants to track the following information about drinkers (can be buddies or husband and wifes) in bars and the beers they *like* made by which beer manufacturers.

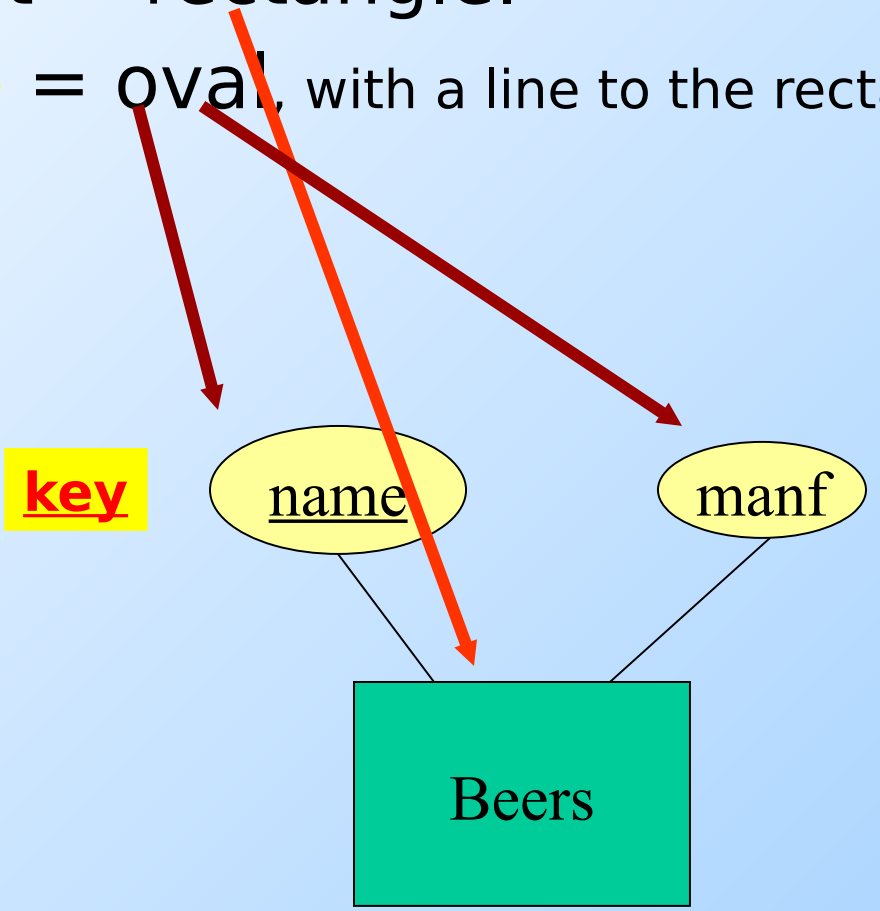
How many Data items?

Entity Sets

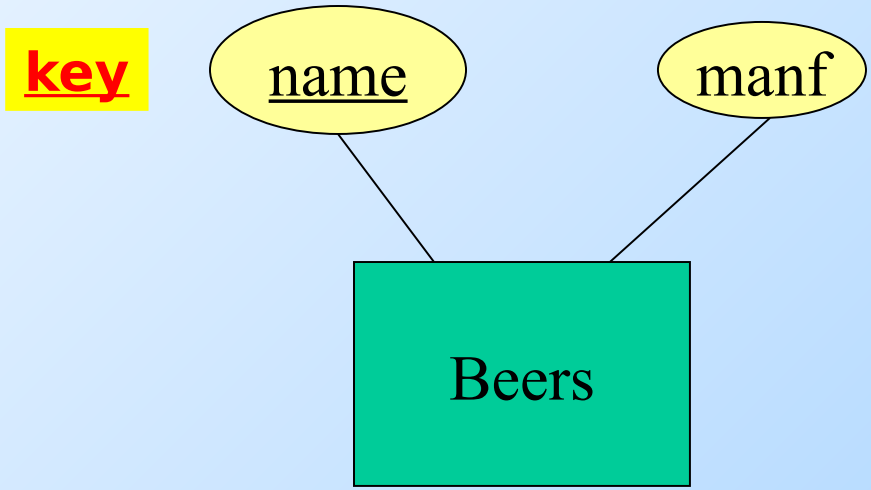
- *Entity* = "thing" or object.
- *Entity set* = collection of similar entities.
  - Similar to a **class** in object-oriented languages.
- *Attribute* = property of an *Entity set*.
  - Attributes are simple values, e.g. integers or character or strings.

ER Diagrams

- In an **E**ntity **R**elationship Diagram:
  - **E**ntity set = rectangle.
  - Attribute = oval, with a line to the rectangle representing its entity set.



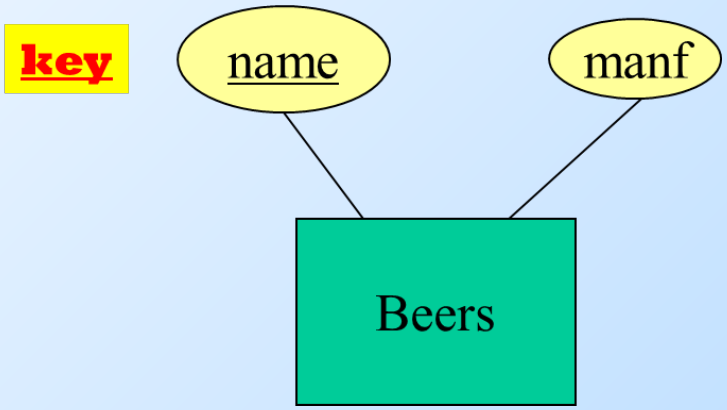
Example



- **E**ntity Set Beers has two attributes, name and manf (manufacturer).
- Each Beers entity has values for these two attributes, e.g. (Bud, Anheuser-Busch)

Entity Set

- The current "value" of an **E**ntity Set is the **set** of **Entities** that belong to it.
  - Example: the set of all Beers in our **data**base.

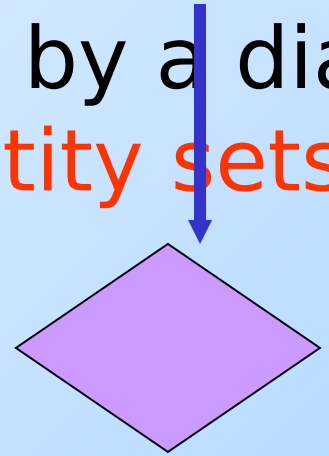


Beers

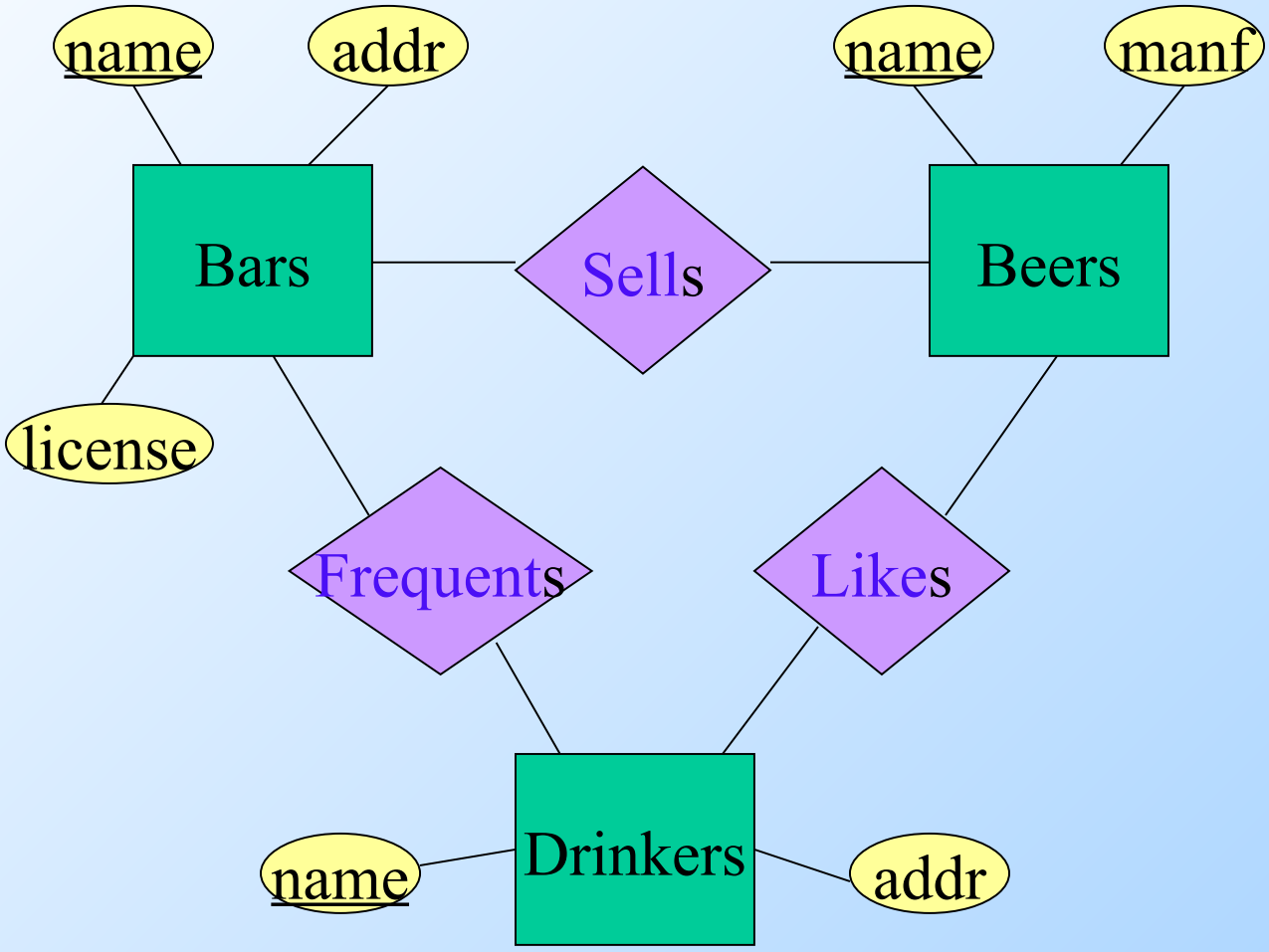
name	manf
Bud	Anheuser-Busch
Miller Lite	Miller

Relationships

- A **R**elationship connects one or more **E**ntity sets.
- It is represented by a diamond, with lines to each of the **E**ntity sets involved.



Example



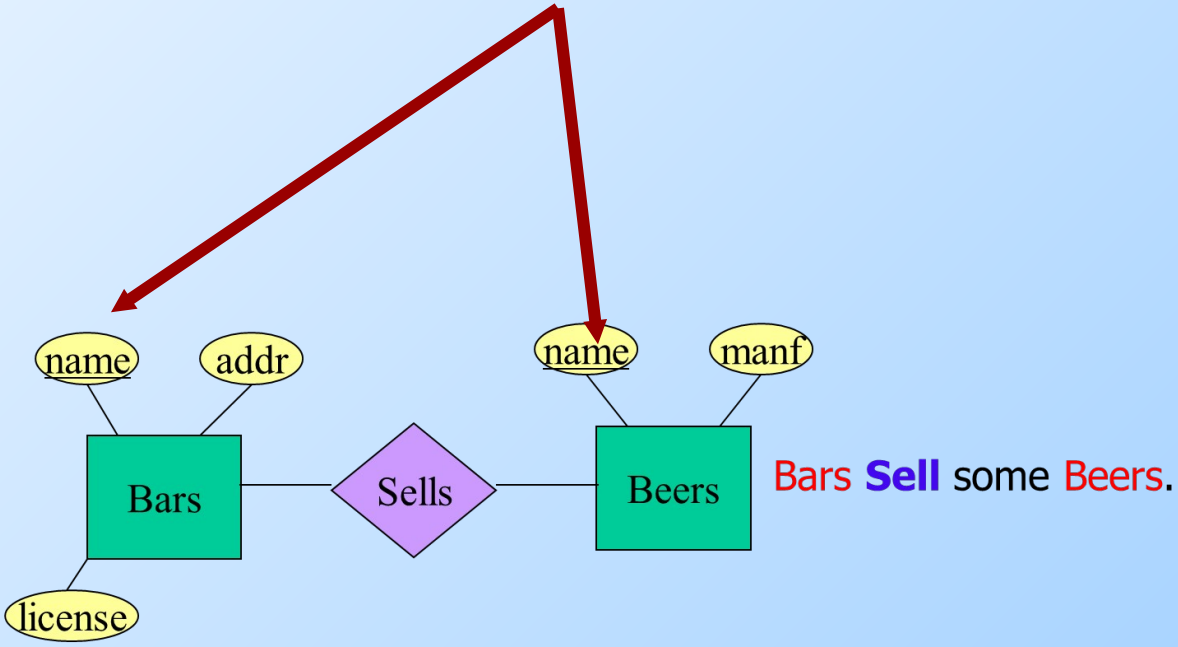
Bars Sell some Beers.

Drinkers Like some Beers.

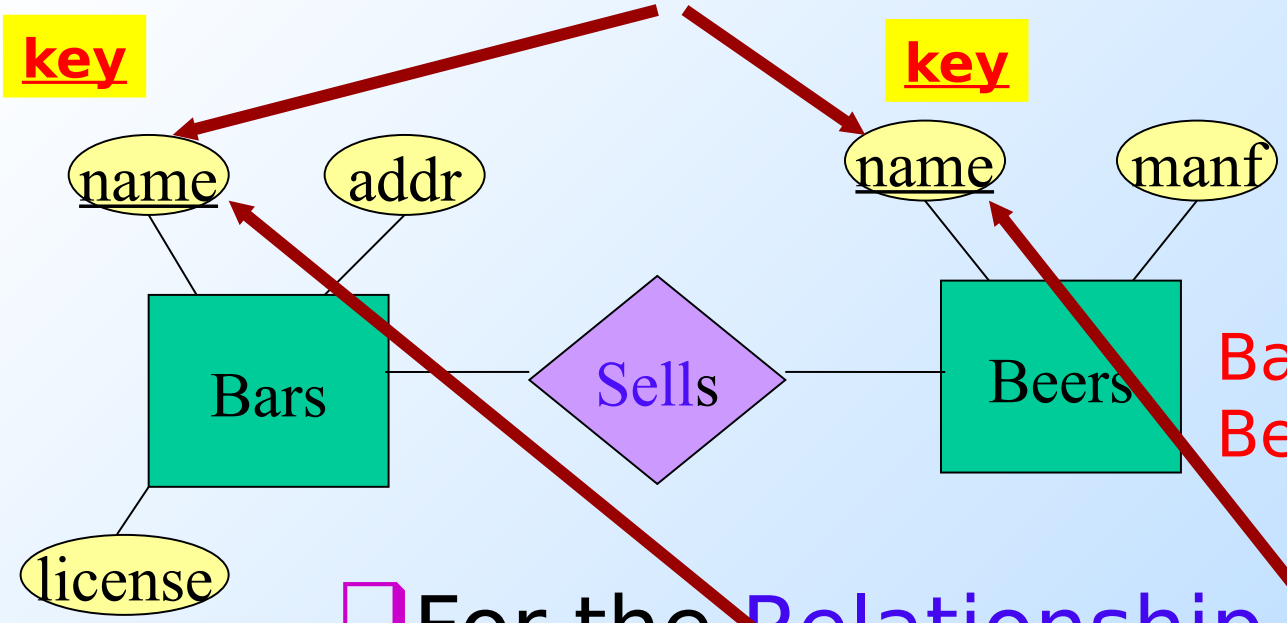
Drinkers Frequen some Bars.

Relationship Set

- The "value" of a Relationship Set is a set of lists of currently related Entity Sets **keys**, one from each of the related Entity Sets.



Example



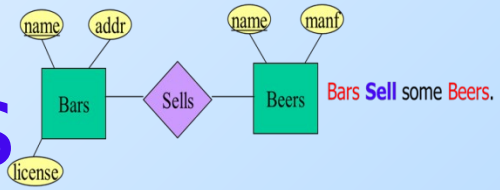
Bars **Sell** some Beers.

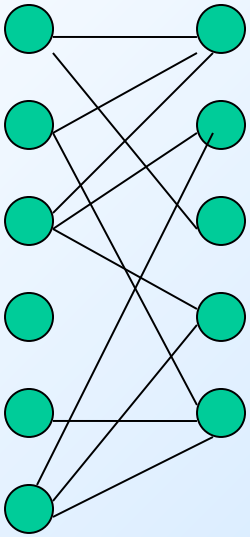
- For the Relationship Sells, we might have a **R**elationship Set values like:

Sell
s

Bar	Beer
Joe's Bar	Bud
Joe's Bar	Miller
Sue's Bar	Bud
Sue's Bar	Pete's Ale
Sue's Bar	Bud Lite

Many-Many Relationships

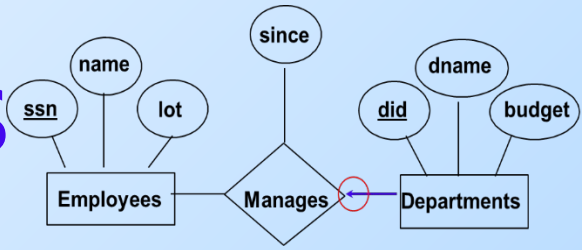


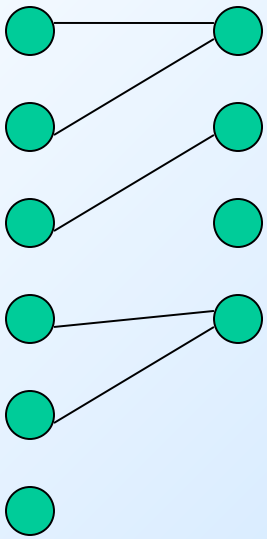


many-many

- Focus: binary Relationships, such as Sells between Bars and Beers.
- In a *many-many* relationship, an Entity of either Set can be connected to **many** Entities of the other Set.
  - e.g., a Bar sells many Beers; a

Many-One Relationships

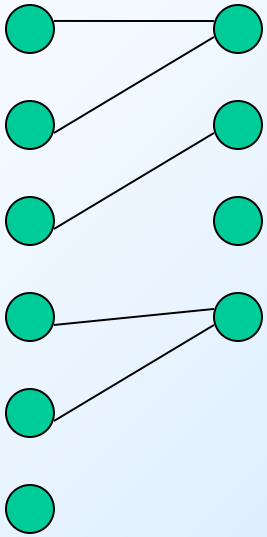


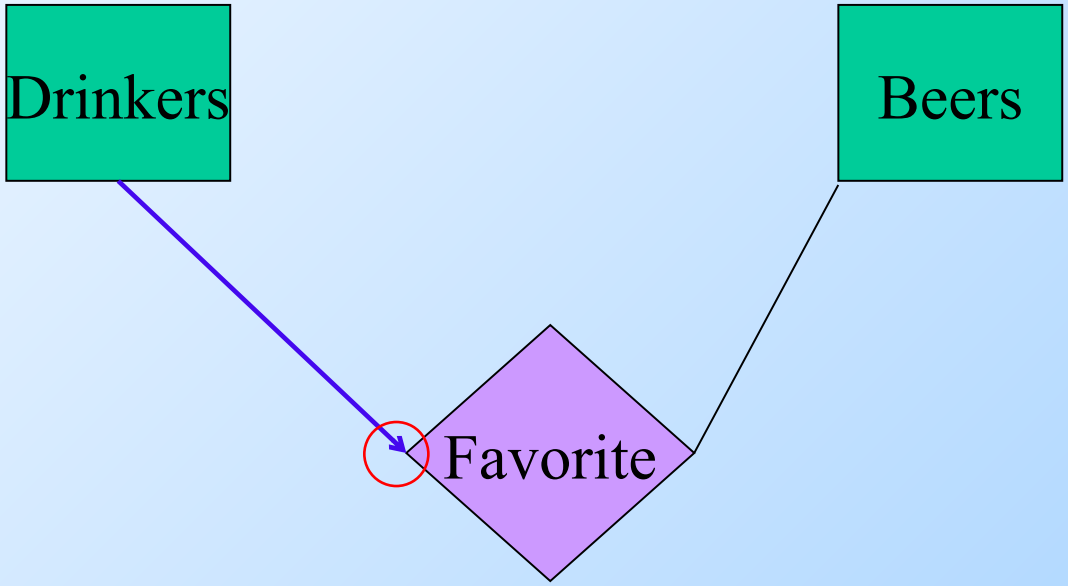


many-one

- Some binary Relationships are *many -one* from one Entity Set to another.
- Each Entity of the first Set is connected to **at most one** Entity of the second Set.
- But an Entity of the second Set can be connected to **zero, one, or many** Entities of the first Set.

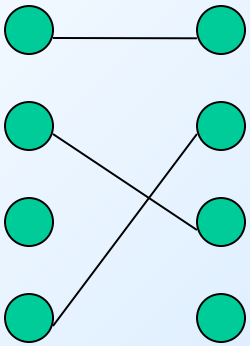
Example





- **Favorite**, from Drinkers to Beers is many-one.
- A Drinker **has at most one** favorite Beer.

One-One Relationships



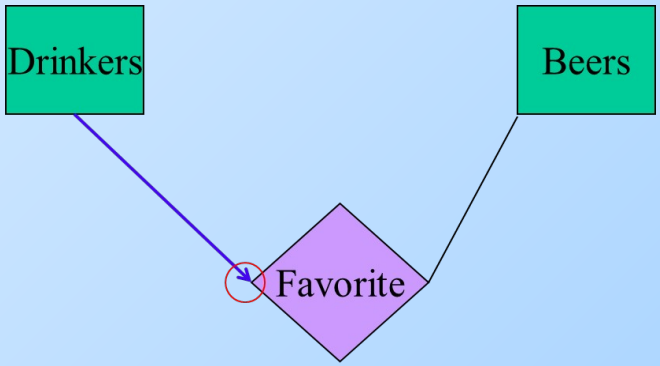
one-one

- In a *one-one* Relationship, each Entity of either Entity set is related to **at most one** Entity of the other Entity set.

- Example: Relationship best-seller between Entity sets Manfs (Manufacturer) and Beers.
  - A Beer cannot be made by more than **one** Manufacturer, and no Manufacturer can have more than **one best-seller** Beer (assume no

Representing “Multiplicity”

- Show a many-one Relationship by an arrow entering the **R**elationship Set towards the “one” side.



- arrow = “exactly one,” i.e., each Entity of the **first Set** is **related to exactly one** Entity of the **target Set**.

Standard Symbols

Textual Analysis ERD Standard **HIGHLIGHTS:**

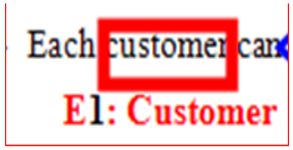
1. Es NEED **LABELS** beside **NUMBERS**. SINCE Es BECOME TABLES, an OPTION is to USE ALL UPPERCASE in LABELS. Labels should at least start with an Upper Case Letter.

TEMPLATE:

1. **Entity Set Template**:

You can copy and paste this **E Template** on the page where you want to use it!

EXAMPLE:



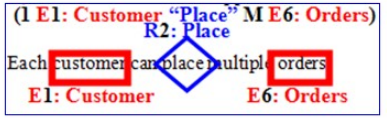
2. Rs NEED **LABELS** beside **NUMBERS**.

TEMPLATE:

2. **Relationship Set Template**:

You can copy and paste this **R Template** on the page where you want to use it!

EXAMPLE:



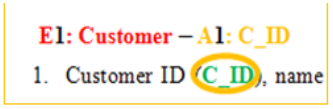
3. As NEED **LABELS** beside **NUMBERS** and THEIR **E#: LABEL** or **R#: LABEL**.

TEMPLATE:

1. **Attribute Template**:

You can copy and paste this **A Template** on the page where you want to use it!

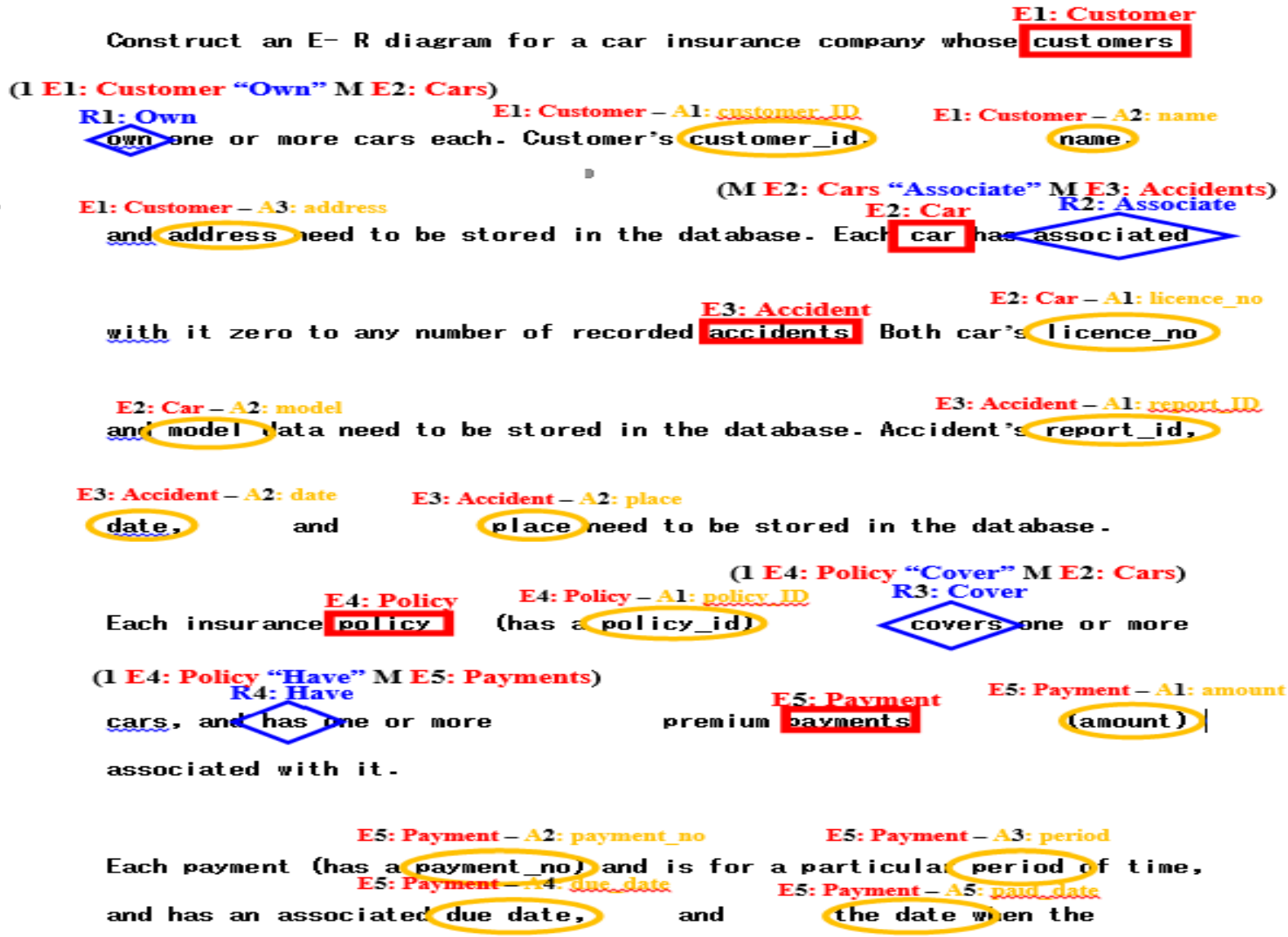
EXAMPLE:



Data Requirements

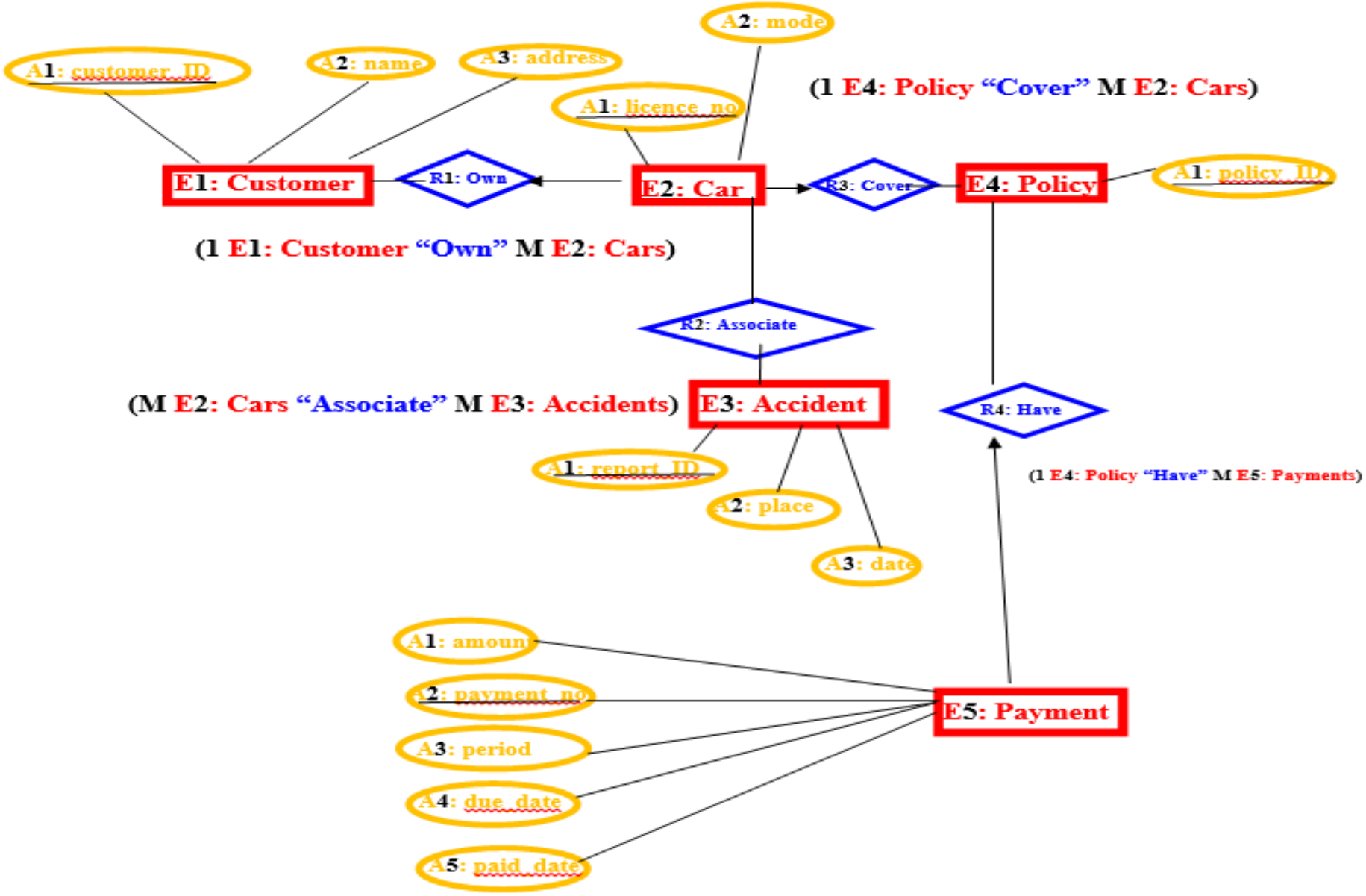
Construct an E- R diagram for a car insurance company whose customers own one or more cars each. Customer's customer_id, name, and address need to be stored in the database. Each car has associated with it zero to any number of recorded accidents. Both car's licence_no and model data need to be stored in the database. Accident's report_id, date, and place need to be stored in the database. Each insurance policy (has a policy_id) covers one or more cars, and has one or more premium payments (amount) associated with it. Each payment (has a payment_no) and is for a particular period of time, and has an associated due date, and the date when the payment was received.

Data Analysis (Domain/Textual Annotations) – Step 1



ERD Model – Step 2

ERD Model to English

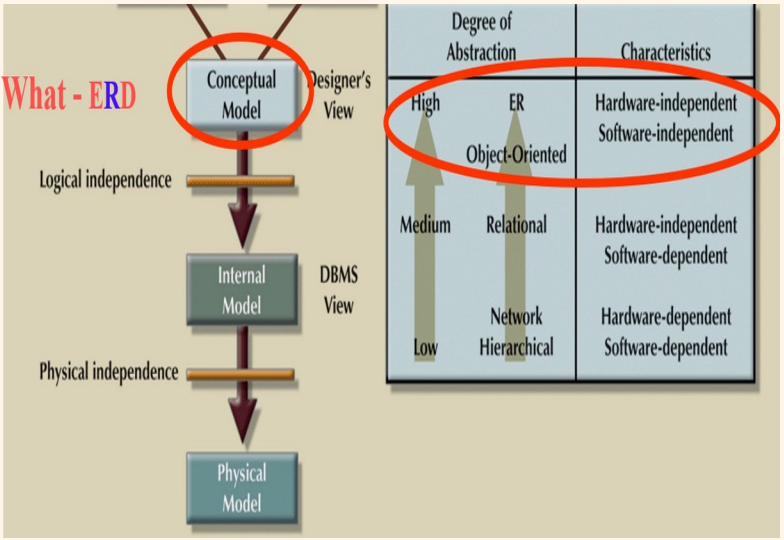


ERD Model to English

Construct an E- R diagram for a car insurance company whose customers own one or more cars each. Customer's customer_id, name, and address need to be stored in the database. Each car has associated with it zero to any number of recorded accidents. Both car's licence_no and model data need to be stored in the database. Accident's report_id, date, and place need to be stored in the database. Each insurance policy (has a policy_id) covers one or more cars, and has one or more premium payments (amount) associated with it. Each payment (has a payment_no) and is for a particular period of time, and has an associated due date, and the date when the payment was received.

ERD to English?

- [ ] 3. SET 1 - 2:DATA MODELING - WHAT - ERD MODEL 0% 0%
  - [ ] 3.1 Discovery 0% 0%
  - [ ] 3.2 Entities, relationships, and attributes 0%
  - [ ] 3.3 Cardinality 0% 0%
  - [ ] 3.4 Independent and dependent entities 0% 0%
  - [ ] 3.5 Supertype and subtype entities 0% 0%



1. **Analysis** develops an entity-relationship model, capturing data requirements while ignoring implementation details.

Analysis steps.

Step	Name
1	Discover entities, relationships, and attributes
2	Determine cardinality
3	Distinguish strong and weak entities
4	Create supertype and subtype entities

PARTICIPATION ACTIVITY | 3.1.1: Discover entities.

We fly many flights in and out of airports. We keep track of airport codes and addresses, because we often ship airplane parts direct to the airport. Each flight has up to 220 passengers, depending on the size of the aircraft. When a traveler makes a booking, we have to save the total cost because prices change all the time. We also record the passenger name, credit card, and mileage plan number.

1. **Entity Set Template**:
   E1: Customer

You can copy and paste this **E Tem**

EXAMPLE:

Each customer can
E1: Customer

PARTICIPATION ACTIVITY | 3.1.2: Discover relationships.

We fly many flights in and out of airports. We keep track of airport codes and addresses, because we often ship airplane parts direct to the airport. Each flight has up to 220 passengers, depending on the size of the aircraft. When a traveler makes a booking, we have to save the total cost because prices change all the time. We also record the passenger name, credit card, and mileage plan number.

(1 E1: Customer "Place" M E6: Orders)

R2: Place

You can copy and paste this R Template on the

EXAMPLE:

PARTICIPATION ACTIVITY | 3.1.3: Discover attributes.

We fly many flights in and out of airports. We keep track of airport codes and addresses, because we often ship airplane parts direct to the airport. Each flight has up to 220 passengers, depending on the size of the aircraft. When a traveler makes a booking, we have to save the total cost because prices change all the time. We also record the passenger name, credit card, and mileage plan number.

1. **Attribute Template**:

E1: Customer – A1: C_ID

You can copy and paste this **A Temp**

EXAMPLE:

E1: Customer – A1: C_ID

1. Customer ID (C_ID), name

PARTICIPATION ACTIVITY | 3.1.4: Discovery.

Refer to the following interview:

Our department tracks student information. We have a record of every course taken by students and the professor who taught the course. We also keep track of the name and number of credits for each course. For professors, we always store the name and current title, such as "Assistant Professor" or "Visiting Lecturer".

1) Which noun is an entity?

- ○ information
- ○ name
- ◉ professor

"Professor" is a set of people. Since the database tracks professor names and courses taught, "Professor" is an entity.

?????

PARTICIPATION ACTIVITY | 3.1.6: Synonyms and descriptions.

We fly many flights in and out of airports. We keep track of airport codes and addresses because we often ship airplane parts direct to the airport. Each flight has up to 220 passengers, depending on the size of the aircraft. When a traveler makes a booking, we have to save the total cost because prices change all the time. We also record the passenger name, credit card, and mileage plan number.

Anyone with a booking is a passenger. Airline employees fly free, but they still occupy seats and have to book tickets. People like flight attendants don't occupy regular seats, so we don't consider them passengers.

Database user

Glossary

Entity Name: Passenger

Synonyms: Traveler, Customer

Description: A passenger is any person who occupies a seat on a flight. Passengers include both paid and unpaid seat occupants, but excludes flight officers, flight attendants, and in-cabin pets.

PARTICIPATION ACTIVITY | 3.1.7: Synonyms and descriptions.

1) Must entity, relationship, and attribute synonyms follow naming conventions?

- ○ Yes
- ○ Only attribute synonyms must follow naming conventions.
- ◉ No

Synonyms help users map commonly used terms to official names. Synonyms should reflect common usage, not naming conventions.

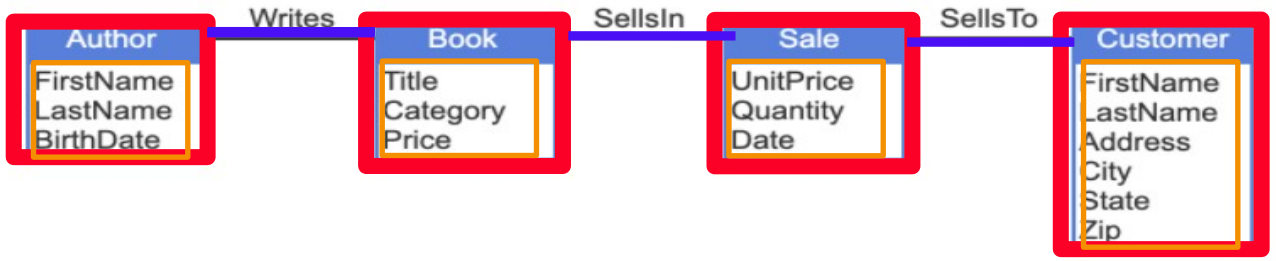
?????

Entities, relationships, and attributes are depicted in ***ER diagrams***:

- Rectangles represent entities. Entity names appear at the top of rectangles.
- Lines between rectangles represent relationships.
- Text inside rectangles and below entity names represent attributes.

ER diagrams are usually supplemented by textual descriptions of entities, relationships, and attributes.

Figure 2.3.1: ER diagram.



PARTICIPATION ACTIVITY 2.3.1: Analysis.

Refer to the ER diagram above.

1) What is 'Writes'?

- ○ Entity
- ◉ Relationship
- ○ Attribute

Author-Writes-Book is a relationship between the Author and Book entities. Relationships are depicted as lines on ER diagrams.

?????

TA time (Alvaro) – ~5 minutes
(CA 3.1.1 – Step 1 – Entity Sets)

CHALLENGE ACTIVITY | 3.1.1: Discovery.

Read requirements

Our library system has several branches. Each branch has an address and a unique code. Each book belongs to a particular branch. Each book is assigned a unique barcode number and has a title and a publisher name. Each library member may borrow up to three books at a time. To join the library, a member provides an identification number and identification type, such as driver's license, passport number, or employee number.

What are the entities?

- [ ] Library
- [ ] Book
- [ ] Publisher
- [ ] Address
- [ ] Member
- [ ] Branch

1

Check Next

COSC 3380 23578 M & W 4 to 5:30 PM LECTURE (in TEAMS from 3:50 to 5:15 PM)

53:00

Take control | Pop out | Chat | 116 People | Raise | View | Rooms | Apps | More | Camera | Mic | Share | Leave

Urtaza, Alvaro A | View all

zyBooks My library > COSC 3380: Database Systems home > 3.1: Discovery | zyBooks catalog | Help/FAQ | Alvaro Urtaza

CHALLENGE ACTIVITY | 3.1.1: Discovery.

Jump to level 1

Our shipping company operates a line of container ships. We know the number of containers each ship can hold. Each container is identified by an industry-standard code. Containers are brought to ships and taken from ships by specially designed trucks. We track the latitude and longitude of each truck and each ship. Each truck is identified by our own naming system. While in transit, each container is either on a ship or on a truck. For each container, we know the customer name.

What are the entities?

- [ ] Truck
- [ ] Latitude
- [ ] Company
- [ ] Container
- [ ] Ship
- [ ] Customer

1 2 3

Check | Next

✔ Expected: Truck, Container, Ship

The database tracks information about trucks, such as latitude, longitude, and name, so Truck is an entity.

Latitude is an attribute of the ship and truck entities, not an entity.

All data in the database pertains to 'our shipping company'. Since the database does not track multiple

Urtaza, Alvaro A

Participants

Invite someone or dial a number

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In this meeting (116) | Mute all

- Hilford, Victoria — Organizer
- RA Adhikari, Rohit
- AA Akram, Ali
- BA Akukwe, Benetta O
- SA Alsayed, Sami H
- SA Altaf, Sameer
- SA Alvarez, Stephanie
- OA Anayor-Achu, Ogochukwu E
- HA Avci, Hatice Kubra
- RA Aysola, Riya
- AB Bahl, Anish

Type here to search | Earnings upcoming | 4:41 PM 1/22/2024

TA time (Alvaro) – ~5 minutes
(CA 3.1.1 Step 2 – Relationship Sets)

CHALLENGE ACTIVITY | 3.1.1: Discovery.

Read requirements

Our business has a number of factories. Each factory has a name and an address. Each factory makes several products. Each product has a product ID, name, and description. Many kinds of parts are used in manufacturing each product. Each kind of part is identified by number. Each part has a bin number indicating where the part is stored.

The entities are Factory, Product, and Part.

What are the relationships?

- ☐ Factory-Makes-Part
- ☐ Bin-IsLocatedIn-Factory
- ☐ Business-Has-Factory
- ☐ Factory-Makes-Product
- ☐ Product-Contains-Part

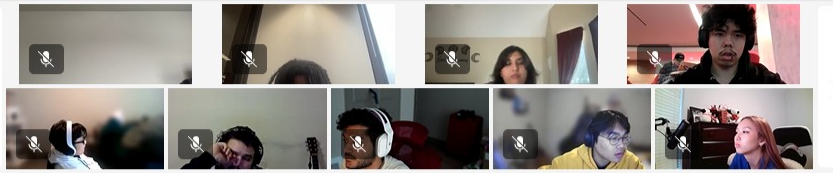
2

Check | Next

COSC 3380 23578 M & W 4 to 5:30 PM LECTURE (in TEAMS from 3:50 to 5:15 PM)

54:21

Take control | Pop out | Chat | 116 People | Raise | View | Rooms | Apps | More | Camera | Mic | Share | Leave



Urtaza, Alvaro A

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Our shipping company operates a line of container ships. We know the number of containers each ship can hold. Each container is identified by an industry-standard code. Containers are brought to ships and taken from ships by specially designed trucks. We track the latitude and longitude of each truck and each ship. Each truck is identified by our own naming system. While in transit, each container is either on a ship or on a truck. For each container, we know the customer name.

The entities are Container, Ship, and Truck.

What are the relationships?

- [ ] Ship-Holds-Container
- [ ] Truck-Holds-Container
- [ ] Ship-Holds-Truck
- [ ] Company-Has-Container
- [ ] Customer-Buys-Container

1 2 3

Check Next

✔ Expected: Ship-Holds-Container, Truck-Holds-Container

Ship and Container are entities, and the database tracks which ship holds each container. So Ship-Holds-Container is a relationship.

The database does not mention that a ship can hold a truck. So Ship-Holds-Truck is not a relationship.

Customer is not an entity in this database, so Customer-Buys-Container is not a relationship.

Truck and Container are entities, and the database tracks which truck holds each container. So Truck-Holds-Container is a relationship.

Company is not an entity in this database, so Company-Has-Container is not a relationship.

View solution (Instructors only)

Urtaza, Alvaro A

Participants

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- SA Alvarez, Stephanie
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- HA Avci, Hatice Kubra
- RA Aysola, Riya
- AB Bahl, Anish

Type here to search

Earnings upcoming

4:43 PM 1/22/2024

TA time (Alvaro) – ~5 minutes (CA 3.1.1 Step 3 – Attributes)

CHALLENGE ACTIVITY | 3.1.1: Discovery.

Read requirements

Our business has a number of factories. Each factory has a name and an address. Each factory makes several products. Each product has a product ID, name, and description. Many kinds of parts are used in manufacturing each product. Each kind of part is identified by number. Each part has a bin number indicating where the part is stored.

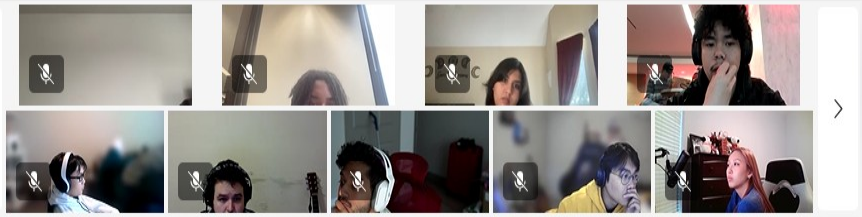
The entities are Factory, Product, and Part.

What are the attributes of each entity?

Factory	Product	Part	
☐	☐	☐	ID
☐	☐	☐	ProductName
☐	☐	☐	PartNumber
☐	☐	☐	FactoryName
☐	☐	☐	Address
☐	☐	☐	BinNumber
☐	☐	☐	Description

3

Check Next



Urtaza, Alvaro A

View all

Participants

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- RA Aysola, Riya
- AB Bahl, Anish

campuses of more than one college.

The entities are College, Campus, and City.

What are the attributes of each entity?

	College	Campus	City
CampusName	☐	☐	☐
StudentCount	☐	☐	☐
CityName	☐	☐	☐
CollegeName	☐	☐	☐
Address	☐	☐	☐
Have	☐	☐	☐
CollegeCode	☐	☐	☐

1 2 3

Check Next **Done**. Click any level to practice more. Completion is preserved.

✔ Expected:
College: StudentCount, CollegeName, CollegeCode
Campus: CampusName, Address
City: CityName

CollegeName, CollegeCode, and StudentCount are attributes of College, since 'Each college has a name, a code, and the count of students currently enrolled'.

CampusName and Address are attributes of Campus, since 'Each campus has a name that is unique within the college and has an address'.

CityName is an attribute of City, since 'Cities are identified by name'.

Have becomes the relationship College-Has-Campus, not an attribute, since 'Each college may have more than one campus'.

View solution (Instructors only)

Feedback?

Urtaza, Alvaro A

3.3 Cardinality

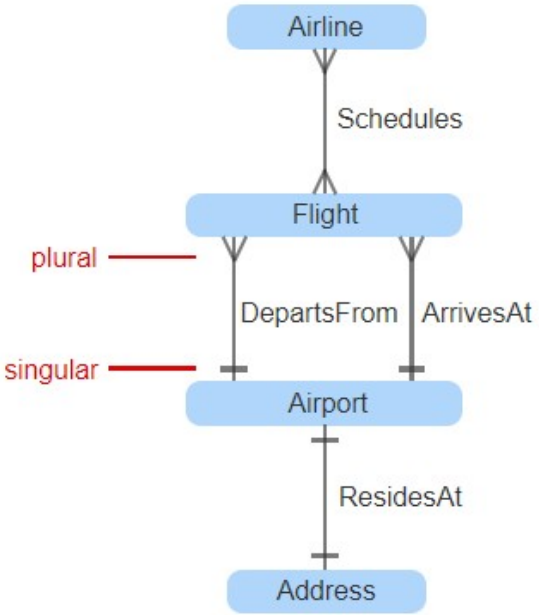
Relationship maximum

In entity-relationship modeling, ***cardinality*** refers to maxima and minima of relationships and attributes.

Relationship maximum is the greatest number of instances of one entity that can relate to a single instance of another entity. A relationship has two maxima, one for each of the related entities. Maxima are usually specified as one or many. A related entity is ***singular*** when the maximum is one and ***plural*** when the maximum is many.

On ER diagrams, maximum of one is shown as a short bar across the relationship line. Maximum of many is shown as three short lines that converge at a point. The three lines look like a bird's foot, so this convention is called ***crow's foot*** notation.

PARTICIPATION ACTIVITY | 3.3.1: Relationship maximum.



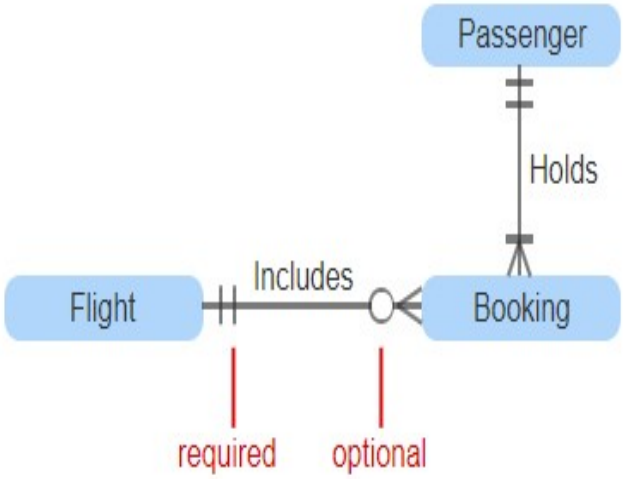
3.3 Cardinality

Relationship minimum

Relationship minimum is the least number of instances of one entity that can relate to a single instance of another entity. A relationship has two minima, one for each of the related entities. Minima are usually specified as zero or one. A related entity is ***optional*** when the minimum is zero and ***required*** when the minimum is one.

On ER diagrams, minimum of one is shown as a short bar across the relationship line. Minimum of zero is shown as a circle. Maxima symbols always appear next to the entity and minima symbols appear further from the entity.

PARTICIPATION ACTIVITY 3.3.3: Relationship minimum.



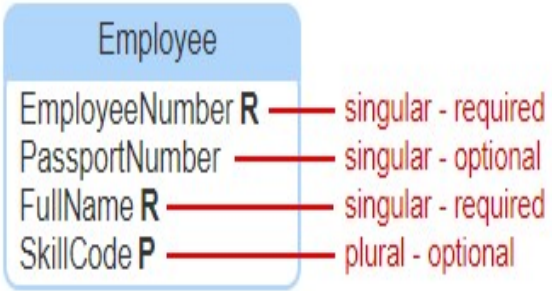
Attribute maximum and minimum

Attribute maximum the greatest number of attribute values that can describe each entity instance Attribute maximum is specified as one (singular) or many (plural).

Attribute minimum the least number of attribute values that can describe each entity instance Attribute minimum is specified as zero (optiona o one (required)

In ER diagrams, attributes are presumed singular and optional. A P" following the attribute indicates the attribute is plura An R" indicates the attribute is required.

PARTICIPATION ACTIVITY 3.3.5: Attribute maximum and minimum.



Unique attributes

Each value of a ***unique attribute*** describes at most one entity instance Ex: Vehicle identification number (VIN) is a unique attribute of Vehicle.

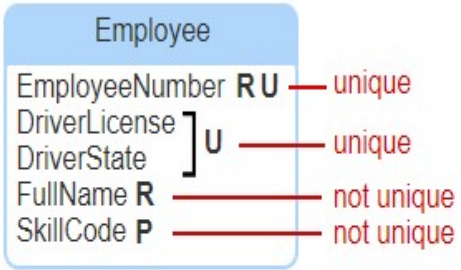
Occasionally, a composite of several attributes is unique, although the individual attributes are not Ex: (AirlineCode, FlightNumber) is a unique composite attribute of Flight. However, AirlineCode and FlightNumber are not individually unique, since flights on different airlines may have the same flight number.

Unique is not the same as a singular:

- A unique attribute has at most one entity instance for each attribute value.
- A singular attribute has at most one attribute value for each entity instance.

In ER diagrams, attributes are presumed not unique. A "U" following the attribute indicates the attribute is unique. Unique composite attributes are grouped with a brace before the "U" symbol.

PARTICIPATION ACTIVITY 3.3.7: Unique attributes.



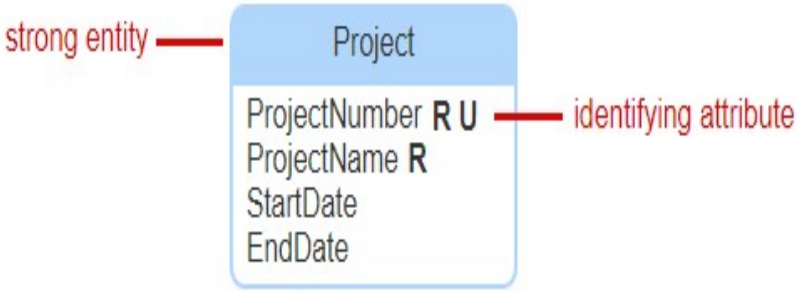
3.4 Strong and weak entities

Strong entities

An ***identifying attribute*** is unique, singular, and required. Identifying attribute values correspond one-to-one to, or ***identify***, entity instances.

A ***strong entity*** has one or more identifying attributes. When a strong entity is implemented as a table, one of the identifying attributes may become the primary key.

PARTICIPATION ACTIVITY 3.4.1: Strong entities.

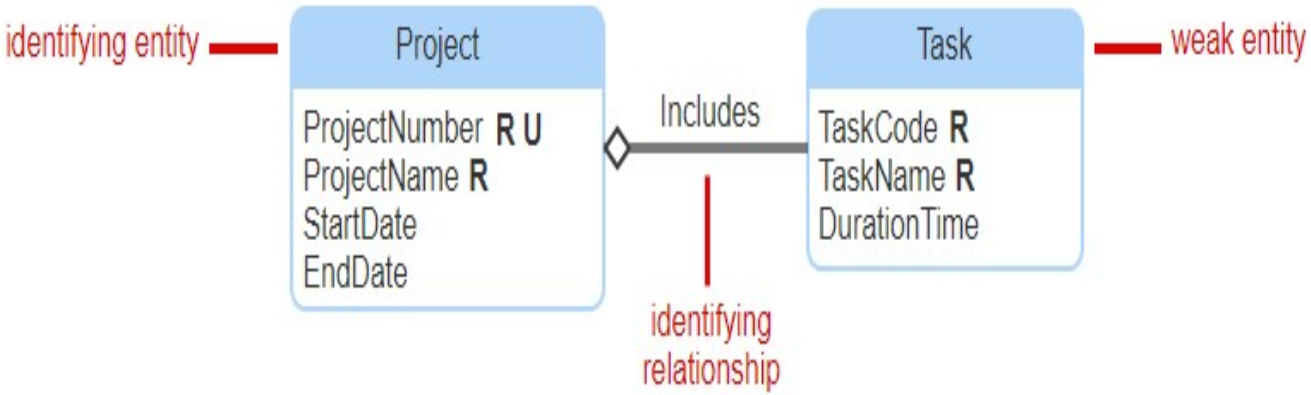


Weak entities

A ***weak entity*** does not have an identifying attribute. Instead, a weak entity usually has a relationship, called an ***identifying relationship***, to another entity, called an ***identifying entity***. The identifying entity must be singular and required in an identifying relationship.

In an ER diagram, an identifying relationship has a diamond next to the identifying entity. Since an identifying entity is always singular and required, the diamond replaces the entity's cardinality symbols.

PARTICIPATION ACTIVITY | 3.4.3: Weak entities.



Practice Questions

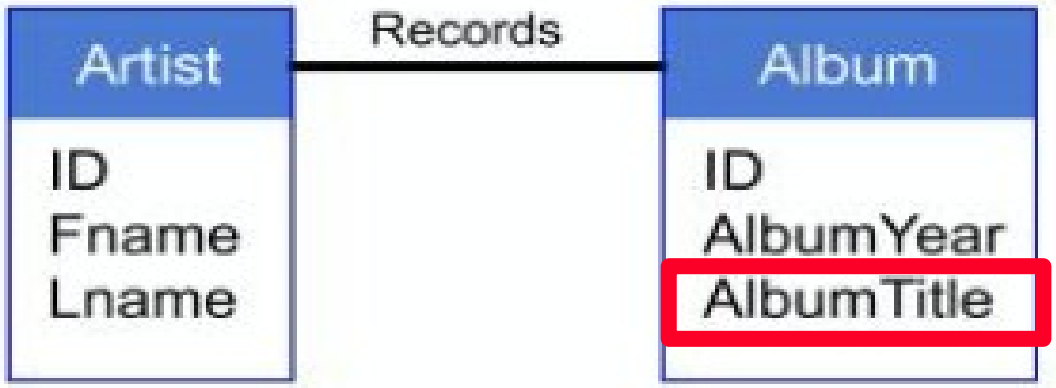
Practice Questions

- [ ] 2. SET 1 - 1:INTRODUCTION
  - [ ] 2.1 Database basics
  - [ ] 2.2 Database systems
  - [ ] 2.3 Database design and programming

☐ 2. SET 1 - 1:INTRODUCTION

Practice Questions

In the following ER diagram, what does 'AlbumTitle' represent?



a. Entity

b. Attribute

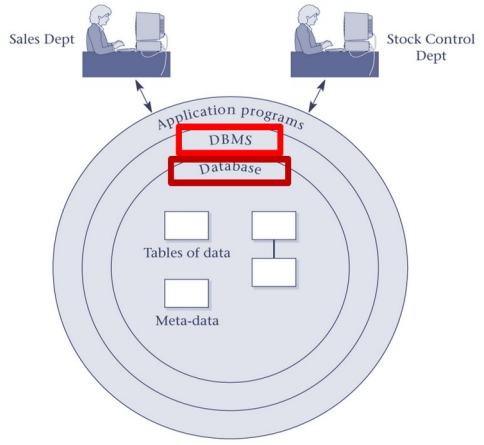
c. Relationship

d. Key

?????

Practice Questions

What links a host programming language to a database system?



a. API

b. SQL

c. Key

d. ID

?????

Practice Questions

Which principle defines data independence?

a. Logical design maintains schema integrity.

b. Physical design never affects query results.

c. Tuning query performance requires application modifications.

d. Modification of indexes generates different results.

?????

Practice Questions

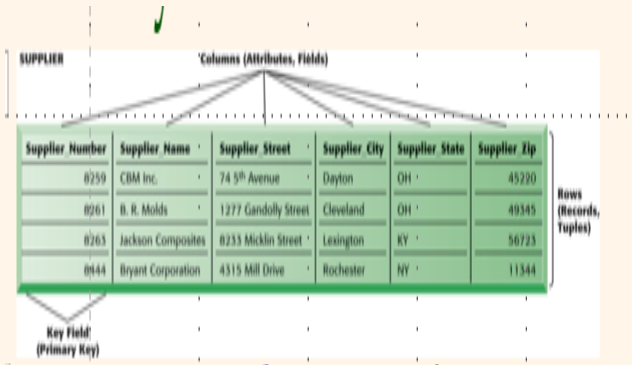
A database _____ is the implementation of database requirements with CREATE TABLE statements.

a. system

b. attribute

c. entity

d. schema

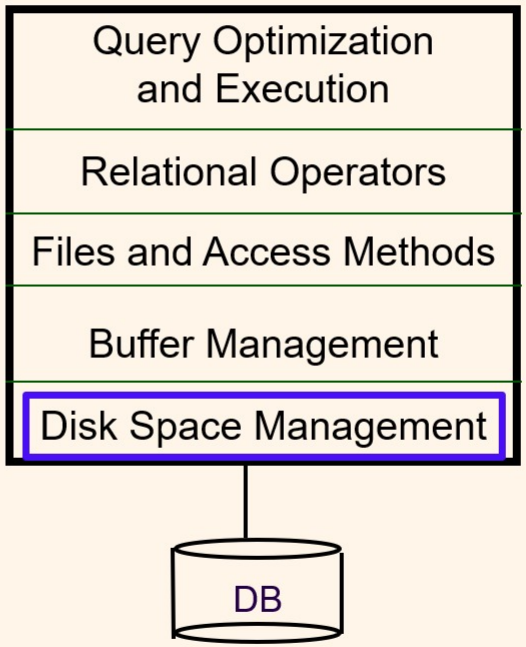


Every *Relation* has a *Schema*, which describes the columns or fields.

Students (*sid*: string, *name*: string, *login*: string, *age*: integer, *gpa*: real)

Practice Questions

In terms of database architecture, which component translates the query processor instructions into low-level file-system commands and is responsible for indexing the data?



a. Transaction manager

b. Storage manager

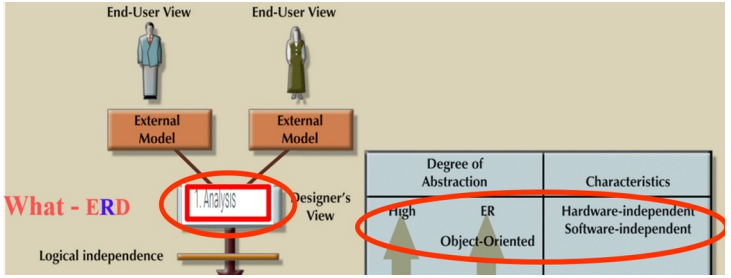
c. Data dictionary

d. Data indexes

?????

From 5:00 to 5:05 PM – 5 minutes.

01.22.2024 (2 - Mo)	ZyBook SET 1 - 2	Set 1 LECTURE 2 DATA MODELING - WHAT - ERD MODEL



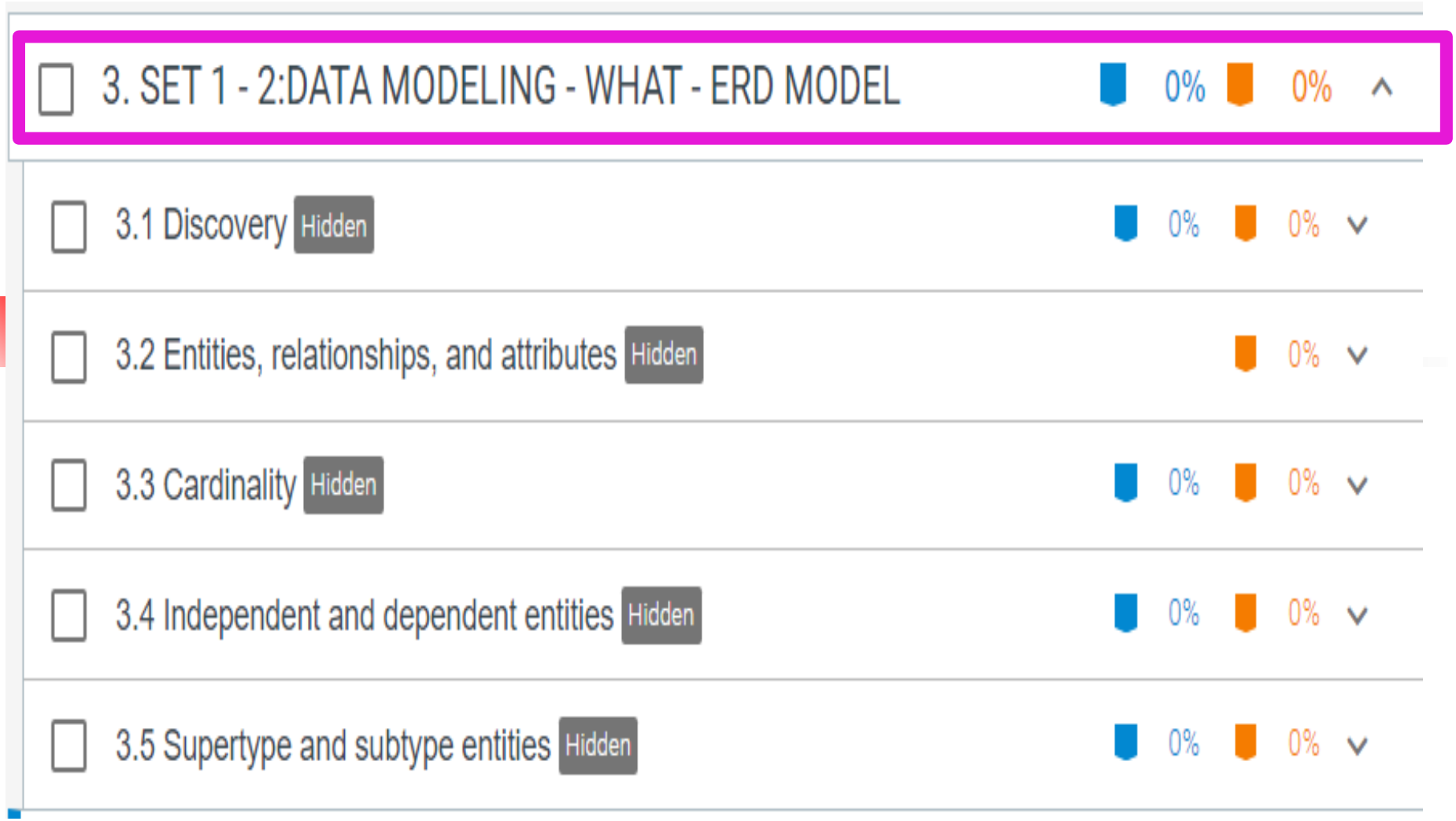
1. SET 1 Empty

3. SET 1 - 2:DATA MODELING - WHAT - ERD MODEL 0% 0%

Please work on

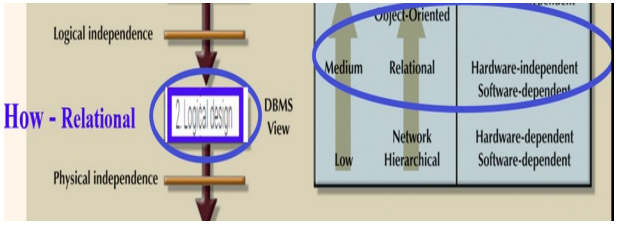
SET 1 – 2: DATA MODELING - WHAT - ERD MODEL

SET 1 Lecture 2
Data Modeling WHAT – ERD MODELS



Next

01.24.2024	ZyBook SET 1 - 3	Set 1
(3 - We)		LECTURE 3 DATA MODELING - HOW - RELATIONAL MODEL



HOW

1. SET 1

4. SET 1 - 3:DATA MODELING HOW - RELATIONAL MODELS 0% 0%

From 5:05 to 5:15 PM – 10 minutes.

01.22.2024 (2 - Mo)	ZyBook SET 1 - 2	Set 1 LECTURE 2 DATA MODELING - WHAT - ERD MODEL

CLASS PARTICIPATION 20 points — 20% of Total

I AM IN TEAMS

Class 2 END PARTICIPATION

Not available until Jan 22 at 5:05pm | Due Jan 22 at 5:15pm | 100 pts

VH, publish

This is an synchronous online class.

Attendance is required.

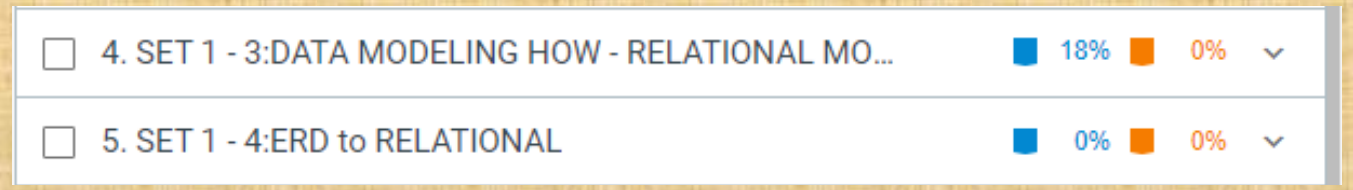
Recording or distribution of class materials is prohibited.

1. At the beginning of selected classes there is an **assessment in the first 10 minutes**. (**beige** BOX in the Detailed Syllabus)
2. At the end of selected classes there is an **assessment in the last 10 minutes**. (**blue** BOX in the Detailed Syllabus)
3. ZyBook sections will be downloaded and used for 30% of Total Score on the dates specified in the Detailed Syllabus.
4. EXAMS are in CANVAS. **No late EXAMS**.

At 5:15 PM.

End Class 2

VH, unhide ZyBook Sections 4 & 5.



VH, Download Attendance Report
Rename it:
1.22.2024 Attendance Report FINAL

VH, upload Class 2 to CANVAS.