Housekeeping

- Dr and Mrs Dialani are the proud parents of twin girls, born Saturday, 2/13.
- Dr Dialani will be engaged full-time with his family for the rest of the semester.
- Assignment due tonight 11PM—late penalties apply
- I can be around until around 4PM if there is interest; I will watch Piazza this evening
- Questions about tonight's assignment?

Ch 7: Basic Data Modeling

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Agenda

- Introduction
- Why Data Modeling?
- How We'll Do Data Modeling
- What You'll Learn To Do
- What Can You Do With A Data Model?

Introduction

- Born and raised in NE PA
- Education: Boston College, U of Kansas
- Worked/Studied in

West Australia	Canada
London, UK	former USSR

- Worked for

Computer HW companies	Non-IT Industries (e.g., Albertsons)
Computer SW companies (incl. Oracle)	Consulting (many industries)

Why Data Modeling?

- To understand some subject
- To depict that understanding in graphical form
- To share that understanding with others
- To use in various business tasks

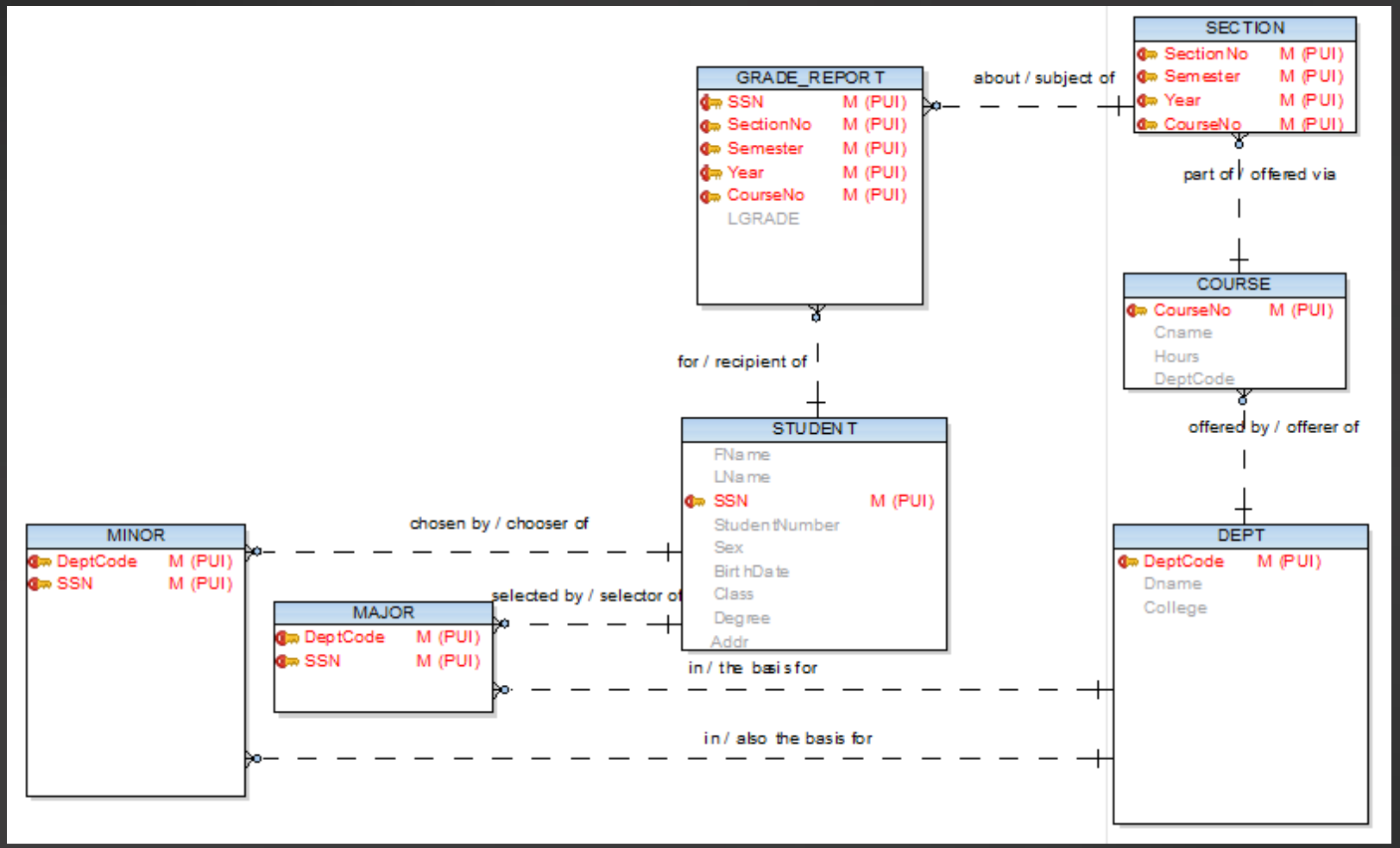
Why Data Modeling?

To understand some subject

- An abstract concept, e.g., the “Standard Model” of nuclear physics
- An industry
- An enterprise (real or imagined)
- A (future) project
- An existing database (via automated reverse engineering)
- An existing application whose data structures aren’t available(via manual reverse engineering)

Why Data Modeling?

To depict your understanding in graphical form(1)



Why Data Modeling?

To depict your understanding in graphical form(2)

- What are the parts of an ER diagram?
- A box: representing an entity (type)
- Terms within the box: representing attributes
- Lines between boxes: representing relationships

Why Data Modeling?

To depict your understanding in graphical form (2)

- We will use formats available in the commonly – used modeling tools:
  - Toad Data Modeler (Free to students)
  - ERWin
  - Oracle Designer
- At work sites you may come across
  - Power Designer
  - System Architect
  - Rational Rose

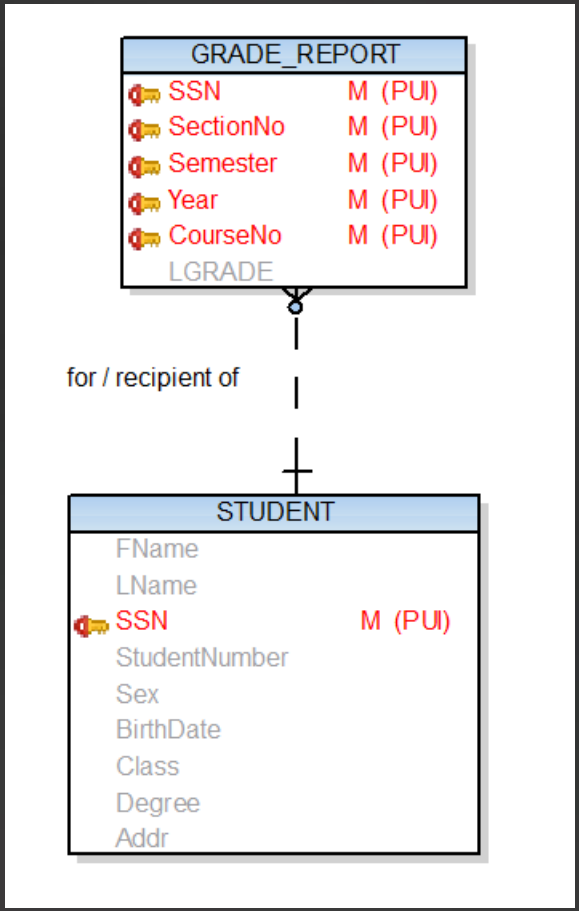
Why Data Modeling?

To depict your understanding in graphical form (3)

- Why so many formats?
  - Attempt to build a “Unique Selling Proposition”
  - Big egos
  - Strongly-held opinions
  - Geography
  - The state of technology
- Expect to encounter some->all of these at work sites
- Anchor yourself in one tool/format then stay flexible and use the tools you’re provided

Why Data Modeling?

To share your understanding with others (2)



Why Data Modeling?

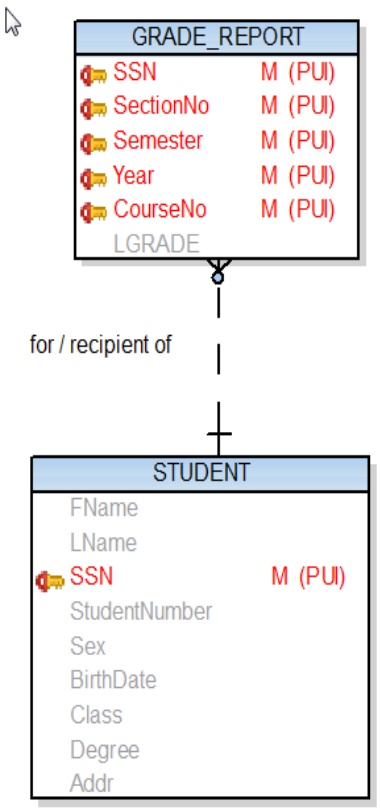
To share your understanding with others

- The common (not recommended) options
  - The universal “has” / “have”
  - “There’s a M:1 relationship between A and B”
  - Plural sentence: “People rent cars”
- Recommended: a structured English sentence
  - Focus on the entity in the singular
  - Use English prepositions or prepositional phrases
  - State optionality (“must” or “may”)
  - State cardinality (“one” or “more than one”)
  - Make a strong, deniable assertion

Why Data Modeling?

To share your understanding with others

“Each”	
<Subject>	
“must be”	If there is a “|” (or “—”) next to the Object
or	
“may be”	If there is an “o” next to the Object
<Relationship>	
“one-and-only-one”	If there is no crow’s foot (“>” or “v”) next to the Object
or	
“one or more”	If there is a crow’s foot (“>” or “v”) next to the Object
<Object(s)>	



To Use In Various Business Tasks

- To develop a new application
  - Database design
  - Online transactions
  - Reports
  - Data Imports and Exports
- To divide a planned application into phases
- To explain an existing application
- To revise an existing application
- To support a “root cause” analysis

How we We'll Do Data Modeling In This Class
Objectives

- Use Information Engineering diagram format
- Read a data model
- Identify errors in a data model
- Modify a data model
  - Correct a relationship
  - Add an attribute
- Translate a data model to a db design

- Note: To learn to develop a complete data model, take the data modeling course!

Exercise

- With a person sitting near you: read through (aloud) each of the relationships on the model of the university database.
- It may seem childish—it's not. I expect you to master this way of reading models, and reading them out loud is a good way to practice.

Data Modeling Formats

- The text uses the NIAM format for data models; we will not be using this format.
- I have never encountered an organization that uses the NIAM format; few tools support it.
- Most books on data modeling use some variant of the IE format.
- My personal favorite is the Barker-Ellis format, but it is not widely supported. (Barker was my data modeling teacher and mentor.)

Terms from the textbook

- The following terms from the textbook can be ignored
  - Complex attribute
  - Composite attribute
  - Entity Set
  - Multivalued attribute
  - Relationship Set
  - Weak entity