Relational Data Modeling
The following slides are taken from the Stanford “UML Data Modeling and UML to Relations” Courses

UML Data Modeling: 5 concepts

✓ (1) Classes
✓ (2) Associations
✓ (3) Association Classes
(4) Subclasses
(5) Composition & Aggregation
UML Data Modeling: Subclasses

Student
- SID
- PK
- sName
- GPA

Subclasses
- ForeignS
  - country
- DomesticS
  - state
  - SSN
- AP Students
  - Took
    - 1..* APCourse
      - course# pk title units
    - 1..10
  - APInfo
    - year
    - grade
Subclass Terminology & Properties

- **Superclass** = Generalization ✓
- **Subclass** = Specialization ✓

- **Incomplete (Partial)** vs. **Complete**
- **Disjoint (Exclusive)** vs. **Overlapping**

.. at most...
UML Data Modeling: 5 concepts

✓ (1) Classes
✓ (2) Associations
✓ (3) Association Classes
✓ (4) Subclasses
✓ (5) Composition & Aggregation
UML Data Modeling: Composition & Aggregation

Objects of one class belong to objects of another class
High-Level Database Design Model

- User-friendly (graphical) specification language
- Translated into model of DBMS
Unified Modeling Language (UML)
Data modeling subset

5 concepts

- (1) Classes
- (2) Associations
- (3) Association Classes
- (4) Subclasses
- (5) Composition & Aggregation

- Designs can be translated to relations automatically

Provided every “regular” class has a key
UML Data Modeling: 5 concepts

1. Classes
2. Associations
3. Association Classes
4. Subclasses
5. Composition & Aggregation
Subclasses

1) Subclass relations contain superclass key + specialized attrs.
2) Subclass relations contain all attributes
3) One relation containing all superclass + subclass attrs.

This is what we will do in this class.

Best translation may depend on properties