Lecture 3A (Monday, Jan 22, 2018)

Logistics

- Working on HW1!
- Last week: entity-relationship modeling

Relational Model

Walk through this translating a Musical Instruments example.

The *relational model* for data describes data in terms of *relations*.

A relation is:

- A set of *n*-tuples
- With attributes
- And primary keys

SQL - our database system - is *almost* relational. The primary difference is that tables are not required to be sets; however, having sets is always good design.

Relationships

Relationships are implemented by *foreign keys* - attributes referencing the primary key of another relation.

- 1-1 relations - store PK
- One-many relations - store PK
- Many-many relations - need a *join relation*

Relational Algebra

We have operations over relations

- Project ($\pi_{a1,a2}(R)$) selects attributes
- Select ($\sigma_{a1=v1}(R)$) selects elements/rows
- Product ($R_1 \times R_2$) computes the *Cartesian product* (all possible combinations)

Play with the instruments example.