

Tu Lam

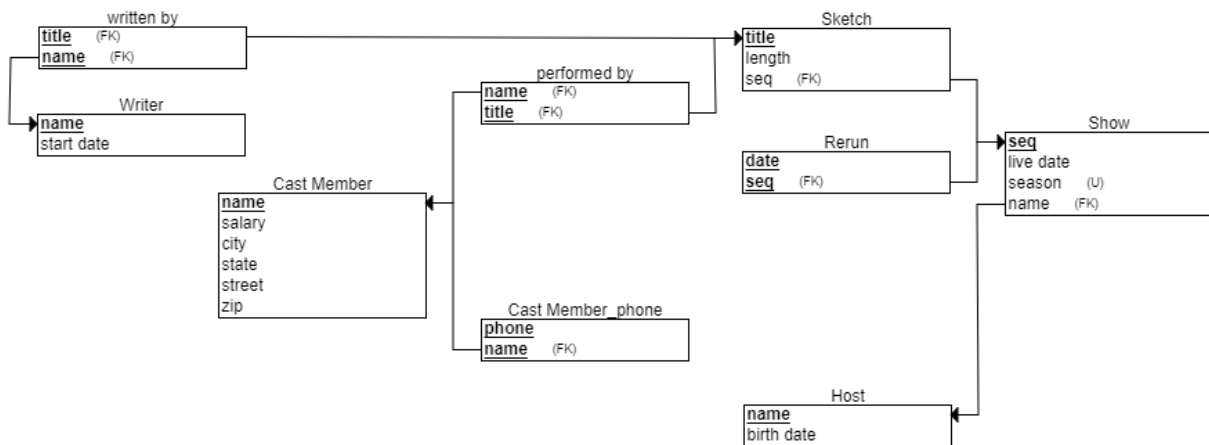
CS 340 / Dr. Julianne Schutfort

Oct 9th, 2020

Homework #2

(Due Date: Oct 11th, 2020)

1. **Figure #1:** This is an image of the Relation Schema of SNL



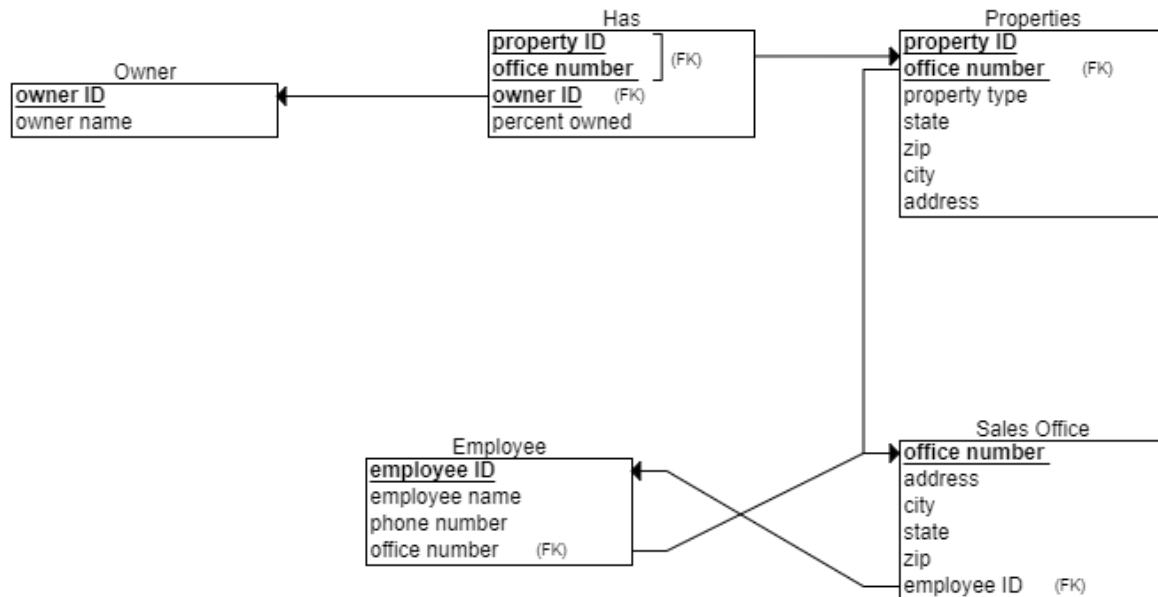
Primary Keys:

- **Writer** entity with the **name** attribute
- **Sketch** entity with the **title** attribute
- **Show** entity with the **seq & season** attribute
- **Host** entity with the **name** attribute
- **Rerun** entity with a weak **date** attribute
- **Cast Member** entity with the **name** attribute

Foreign Keys:

- A (FK) in the **title** attribute from the **Sketch** entity to the **written by & performed by**
- A (FK) in the **name** attribute from the **Writer** entity to the **written by**
- A (FK) in the **name** attribute from the **Cast Member** entity to the **Cast Member_phone & performed by**
- A (FK) in the **seq** attribute from the **Show** entity to the **Rerun & Sketch**
- A (FK) in the **name** attribute from the **Host** entity to the **Show**

2. **Figure #2:** This is an image of the Relation Schema of the Real Estate Firm



Primary Keys:

- **Employee** entity with the *employee ID* attribute
- **Sales Office** entity has a unique *office number* attribute
- **Listing** relationship has a unique *date* for the attribute
- The **Properties** entity has a unique combination of *property ID* attribute
- The **Owner** entity has a unique *owner ID* for the attribute

Foreign Keys:

- A (FK) in the *office number* attribute from the **Sales Office** entity to the **Properties, Employee & has**
- A (FK) in the *employee ID* attribute from the **Employee** entity to the **Sales Office**
- A (FK) in the *property ID* attribute from the **Properties** entity to the **has**
- A (FK) in the *owner ID* attribute for the **Owner** entity to the **has**

Assumptions:

- Assuming that the *employee ID, office number, owner ID, and the property ID* is unique to be easier to identify
- Assuming the **Properties** entity is a weak entity meaning it does not exist if the **Sales Office** never put it on for listing
- Assuming that **Sales Office** can have 0 or 1 employee to manage
- Assuming that **Owner** can have 0 or more properties

3. Here is the list of the primary keys & foreign keys in the database:

Primary Keys:

- **STUDENT** entity with the *student_number* attribute
- **COURSE** entity has a unique *course_number* attribute
- **SECTION** entity has a unique *section_identifier* for the attribute

Foreign Keys:

- A (FK) in the *course_number* attribute from the **COURSE** entity to the **SECTION & PREREQUISITE**
- A (FK) in the *student_number* attribute from the **STUDENT** entity to the **GRADE_REPORT**
- A (FK) in the *section_identifier* attribute from the **SECTION** entity to the **GRADE_REPORT**

a) Insert <150, 'CS162', 'Fall', 2020, 'Smith'> into **SECTION**

Answer: When inserting this into **SECTION**, the key constraint will not be affected since there is no value with the same *section_identifier*. For the referential integrity, since **SECTION** has foreign key from **COURSE**, adding in 'CS 162' will not be good as that *course_number* does not exist in the primary key in **COURSE**. The domain constraint will be fine as all the domain in the new insert fit the format in the tuple but the only format is wrong is in the year as they wrote it 2020 instead of '08' like in the tuple. Lastly is the entity constraint and the primary key in this **SECTION** is fill with value and not null so it is all good.

b) Delete <17, 112, B> from **GRADE_REPORT**

Answer: Since deletion only worry about referential constraint for violation. If we delete this tuple, since this entity does not have any primary key but do have foreign key, it is safe to delete the tuple from this entity.

c) Insert <'CS3380', 'CS3320'> into **PREREQUISITE**

Answer: For this insertion, entity integrity is fine as no value is null. Referential integrity does not violate as the class for both data in the tuple exist in **COURSE** where the foreign key in the **PREREQUISITE** is located as the primary key. The domain constraint is also fine as it follows the domain in the tuple. Lastly the key constraint is violated as the new information about to be insert into **PREREQUISITE** has already existed.

d) Modify the *course_number* of the **SECTION** tuple with *section_identifier* 85 to 'MATH2444'

Answer: Modifying the *course_number* in the **SECTION** will not violate the domain constraint. So, we must look at referential integrity as the update function is similar to delete then insert. In this case changing the *course_number* from 'MATH 2410' to 'MATH2444' will violate referential integrity because foreign key in **SECTION** is the primary key in **COURSE** and changing this will violate as 'MATH2444' does not exist in **COURSE**.