

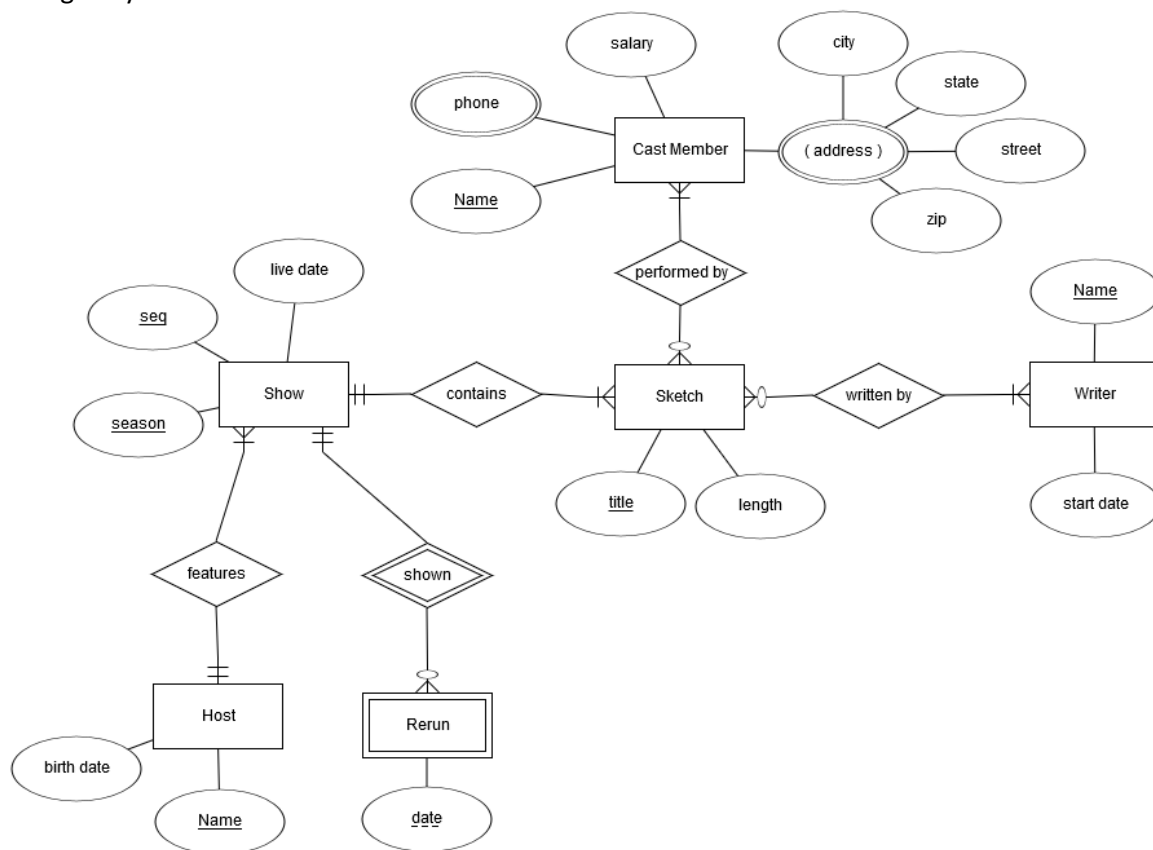
CS 340 – HW 2

Problem 1: (20 pts)

Saturday Night Live (SNL) needs help designing its database. The show stores information about its shows, cast members, guests and sketches. Assume that the only business rules that hold are those stated below, and that no additional business rules hold.

- An SNL show is uniquely identified by a combination of season and sequence number.
- Each show airs live on a particular date (don't worry about whether the year of the date matches the show's season.) The TV network may decide to rerun a popular show, and a rerun may take place on one or several dates. All dates on which a show airs must be recorded in the database. There is at most one re-run per date.
- Each show features a host, uniquely identified by the host's name. There is exactly one host per show. SNL only records hosts in their database who hosted at least one show.
- A show features a series of sketches, described by their titles. A sketch is performed during exactly one show. Sketches are written by one or several writers and performed by one or several cast members.
- You may assume that writers and cast members are uniquely identified by their names.
- Each cast member has at least one address and at least one phone number.

Transform the following ER diagram for an SNL database into a Relational Schema, include all primary and foreign keys.



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Problem 2: (20 pts) Create a Relational Schema for the following description of a Real Estate Firm. Include all primary and foreign keys and list any assumptions you make.

- There are many sales offices in several states. Attributes of a sales office include office number (identifier) and location. Components of location include Address (number & street), City, State and Zip.
- Each sales office is assigned one or more employees. Attributes of employees include employee ID (identifier), employee name and phone number. An employee must be assigned to only one office
- Each sales office has one employee assigned to manage that office. An employee may manage only the sales office he or she is assigned.
- A sales office lists properties for sale. A sales office may have any number of properties listed or may have no properties listed.
- Attributes of property include Property ID (identifier), Property type and location. Components of location include Address (number & street), City, State and Zip.
- When a property is listed the date of the listing and the price is recorded. A property may be listed multiple times by **different** offices but the dates must be unique. *Historic data on past listings is saved in the database.*
- Each unit of property has one or more owners. Attributes of owners are Owner ID (identifier) and Owner name. An attribute between property and owner is Percent Owned.

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Problem 3: (10 pts) **Label** all primary and foreign keys in the database to below. Suppose each of the following operations is applied to the database. Discuss *all* integrity constraints (key, entity, domain, referential) violated by each operation, if any.

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

STUDENT

Name	Student_number	Class	Major
Smith	17	1	CS
Brown	8	2	CS

COURSE

Course_name	Course_number	Credit_hours	Department
Intro to Computer Science	CS1310	4	CS
Data Structures	CS3320	4	CS
Discrete Mathematics	MATH2410	3	MATH
Database	CS3380	3	CS

(b) Delete < 17, 112, 'B' > from GRADE_REPORT.

SECTION

Section_identifier	Course_number	Semester	Year	Instructor
85	MATH2410	Fall	07	King
92	CS1310	Fall	07	Anderson
102	CS3320	Spring	08	Knuth
112	MATH2410	Fall	08	Chang
119	CS1310	Fall	08	Anderson
135	CS3380	Fall	08	Stone

(c) Insert < 'CS3380', 'CS3320' > into PREREQUISITE.

GRADE_REPORT

Student_number	Section_identifier	Grade
17	112	B
17	119	C
8	85	A
8	92	A
8	102	B
8	135	A

PREREQUISITE

Course_number	Prerequisite_number
CS3380	CS3320
CS3380	MATH2410
CS3320	CS1310

(d) Modify the Course_number of the SECTION tuple with Section_identifier 85 to 'MATH2444'.