



ER Design Example

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ER Example

Exercise 2.5 Notown Records has decided to store information about musicians who perform on its albums (as well as other company data) in a database. The company has wisely chosen to hire you as a database designer (at your usual consulting fee of \$2500/day).

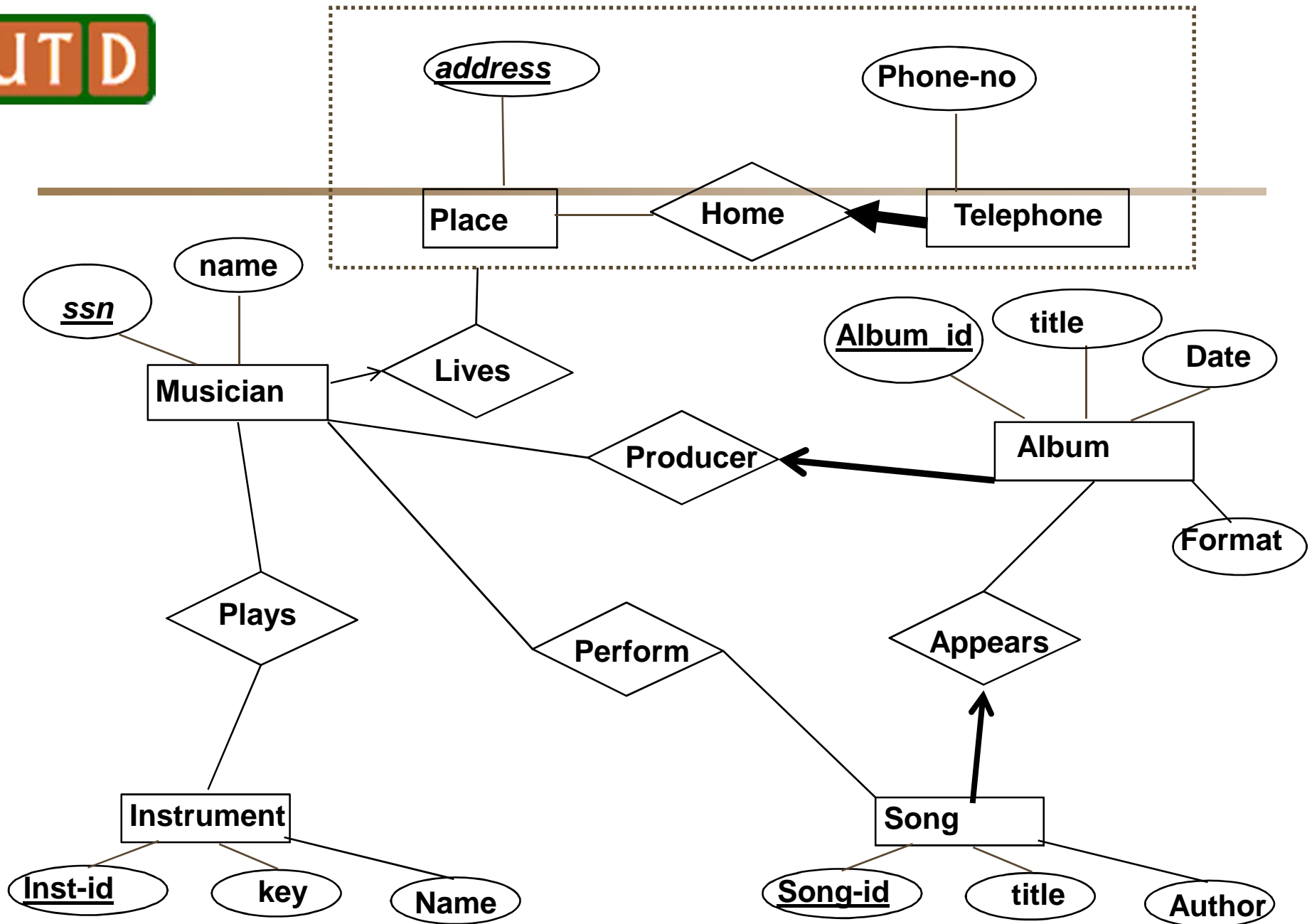
- Each musician that records at Notown has an SSN, a name, an address, and a phone number. Poorly paid musicians often share the same address, and no address has more than one phone.
- Each instrument used in songs recorded at Notown has a unique identification number, a name (e.g., guitar, synthesizer, flute) and a musical key (e.g., C, B-flat, E-flat).
- Each album recorded on the Notown label has a unique identification number, a title, a copyright date, a format (e.g., CD or MC), and an album identifier.
- Each song recorded at Notown has a title and an author.



ER Example

- Each musician may play several instruments, and a given instrument may be played by several musicians.
- Each album has a number of songs on it, but no song may appear on more than one album.
- Each song is performed by one or more musicians, and a musician may perform a number of songs.
- Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course.

Design a conceptual schema for Notown and draw an ER diagram for your schema. The preceding information describes the situation that the Notown database must model. Be sure to indicate all key and cardinality constraints and any assumptions you make. Identify any constraints you are unable to capture in the ER diagram and briefly explain why you could not express them.





Converting ER Diagrams to Relational Database Tables

- Consider the Notown database from Exercise 2.5. You have decided to recommend that Notown use a relational database system to store company data. Show the SQL statements for creating relations corresponding to the entity sets and relationship sets in your design. Identify any constraints in the ER diagram that you are unable to capture in the SQL statements and briefly explain why you could not express them.



Relational Tables

- CREATE TABLE Musicians (
ssn CHAR(10),
name CHAR(30),
PRIMARY KEY (ssn))
- CREATE TABLE Instruments (instrId
CHAR(10),
dname CHAR(30),
key CHAR(5),
PRIMARY KEY (instrId))



Relational Tables

- CREATE TABLE Plays (ssn CHAR(10),
instrId INTEGER,
PRIMARY KEY (ssn, instrId),
FOREIGN KEY (ssn) REFERENCES Musicians,
FOREIGN KEY (instrId) REFERENCES Instruments)
- CREATE TABLE Songs-Appears (songId INTEGER,
author CHAR(30),
title CHAR(30),
albumIdentifier INTEGER NOT NULL,
PRIMARY KEY (songId),
FOREIGN KEY (albumIdentifier) References Album
Producer),



Relational Tables

- CREATE TABLE Telephone Home (
phone CHAR(11),
address CHAR(30),
PRIMARY KEY (phone),
FOREIGN KEY (address) REFERENCES
Place)



Relational Tables

- CREATE TABLE Lives (ssn CHAR(10),
phone CHAR(11),
FOREIGN KEY (phone)
References TelephoneHome,
FOREIGN KEY (ssn) REFERENCES Musicians)
- CREATE TABLE Place (address CHAR(30),
PRIMARY KEY (address))



Relational Tables

- CREATE TABLE Perform (songId INTEGER, ssn CHAR(10), PRIMARY KEY (ssn, songId), FOREIGN KEY (songId) REFERENCES Songs, FOREIGN KEY (ssn) REFERENCES Musicians)
- CREATE TABLE Album Producer (albumIdentifier INTEGER, ssn CHAR(10), *not null* copyrightDate DATE, speed INTEGER, title CHAR(30), PRIMARY KEY (albumIdentifier), FOREIGN KEY (ssn) REFERENCES Musicians)