RELATIONAL DATABASES

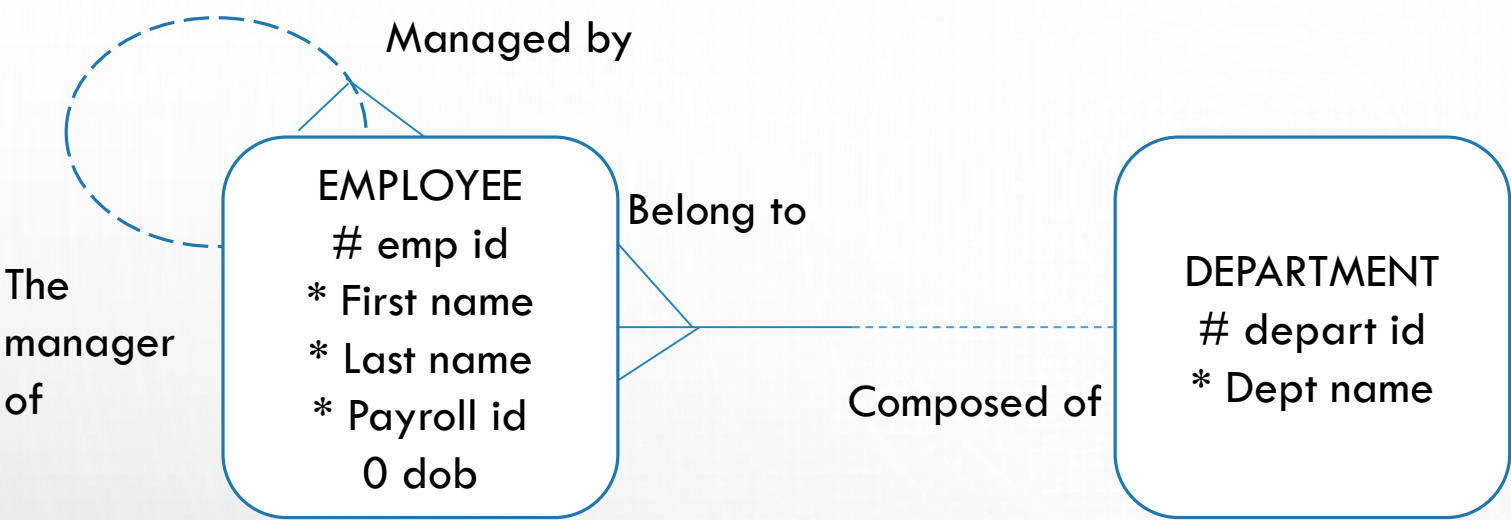RELATIONSHIP MAPPING

OBJECTIVES

- APPLY THE RULE OF RELATIONSHIP MAPPING TO CORRECTLY TRANSFORM 1:M AND BARRED RELATIONSHIPS

- APPLY THE RULE OF RELATIONSHIP MAPPING TO CORRECTLY TRANSFORM 1:1 RELATIONSHIPS

PURPOSE

- RELATIONSHIPS ARE MAPPED BETWEEN PRIMARY KEYS AND FOREIGN KEYS TO ALLOW ONE TABLE TO REFERENCE ANOTHER.

- IF WE DON'T MAP RELATIONSHIPS THERE ARE JUST A LOT OF STANDALONE TABLES THAT DON'T CONNECT TO ANYTHING IN THE DATABASE.

RELATIONSHIPS

- A RELATIONSHIP CREATES ONE OR MORE FOREIGN KEY COLUMNS IN THE TABLE ON THE MANY SIDE OF THE RELATIONSHIP

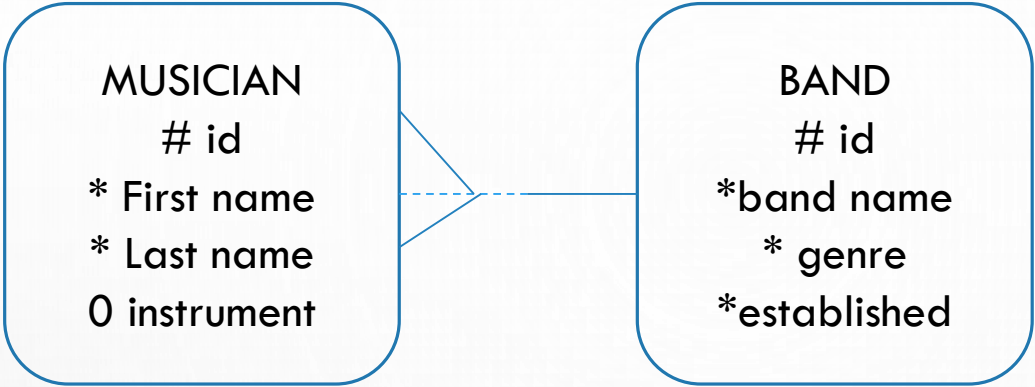- FOREIGN KEY COLUMN MAY BE EITHER MANDATORY OR OPTIONAL

Managed by

The manager of

EMPLOYEE
emp id
* First name
* Last name
* Payroll id
0 dob

Belong to

DEPARTMENT
depart id
* Dept name

Composed of

DEPARTMENTS		
COLUMN NAME	DATA TYPE (SIZE)	CONSTRAINT
department_id	NUMBER(9)	primary key
department_name	CHARACTER(40)	NOT NULL

EMPLOYEES		
COLUMN NAME	DATA TYPE (SIZE)	CONSTRAINT
employee_id	NUMBER (9)	primary key
first_name	CHARACTER(25)	NOT NULL
last_name	CHARACTER(35)	NOT NULL
payroll_id	NUMBER(9)	unique key
date_of_birth	DATE	
department_id	NUMBER(9)	foreign key: departments
manager_id	NUMBER(9)	foreign key: employees

MANDATORY ON THE ONE SIDE OF THE RELATIONSHIP

- RELATIONSHIPS THAT ARE MANDATORY ON THE ONE SIDE, OR MANDATORY ON BOTH SIDES, ARE MAPPED EXACTLY THE SAME WAY AS A RELATIONSHIP THAT IS OPTIONAL ON THE ONE SIDE.

- THE CONCEPTUAL MODEL IS RICH ENOUGH TO CAPTURE OPTIONALITY AT THE BOTH ENDS OF THE RELATIONSHIP.

- HOWEVER THE PHYSICAL MODEL IS LIMITED IN THAT A FOREIGN KEY CAN ONLY ENFORCE MANDATORY ON THE MANY SIDE.

MUSICIAN
id
* First name
* Last name
0 instrument

BAND
id
*band name
* genre
*established

MUSICIAN		
COLUMN NAME	DATA TYPE (SIZE)	CONSTRAINT

BANDS		
COLUMN NAME	DATA TYPE (SIZE)	CONSTRAINT

# MAPPING OF NONTRANSFERABLE RELATIONSHIPS

- A NONTRANSFERABLE RELATIONSHIP MEANS THAT THE FOREIGN KEY COLUMN IN THE DATABASE TABLE CANNOT BE UPDATED.

- THE FOREIGN KEY ITSELF CANNOT ENFORCE THIS IN THE DATABASE.

- ADDITIONAL PROGRAMMING IS NEEDED.

PAY CHECK
id
* Pay period

EMPLOYEE
id
* First name
* Last name
* Payroll id
0 dob
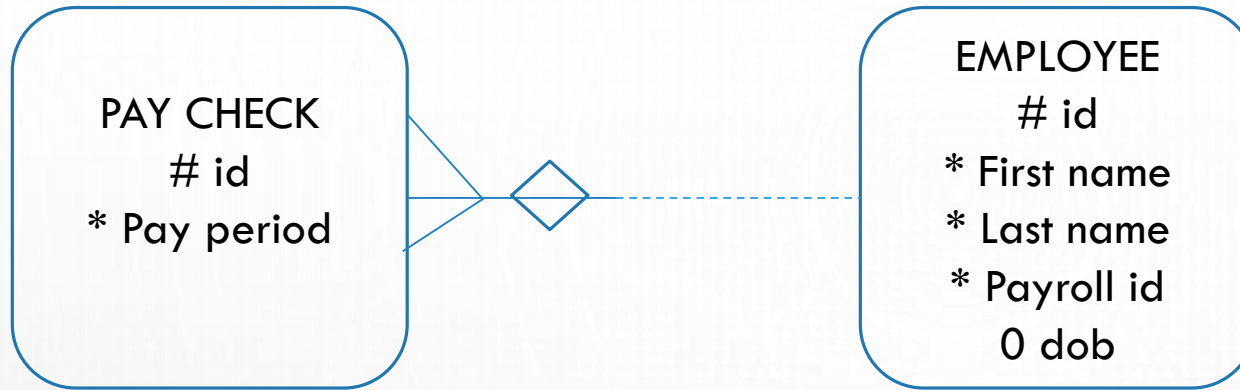
PAYCHECKS		
COLUMN NAME	DATA TYPE (SIZE)	CONSTRAINT

MAPPING BARRED RELATIONSHIPS

- A BARRED RELATIONSHIP IS MAPPED TO A FOREIGN KEY COLUMN ON THE MANY SIDE, JUST LIKE ANY OTHER 1:M RELATIONSHIP

- IN THIS CASE THE FOREIGN KEY PLAYS A DOUBLE ROLE BECAUSE IT IS ALSO PART OF THE PRIMARY KEY
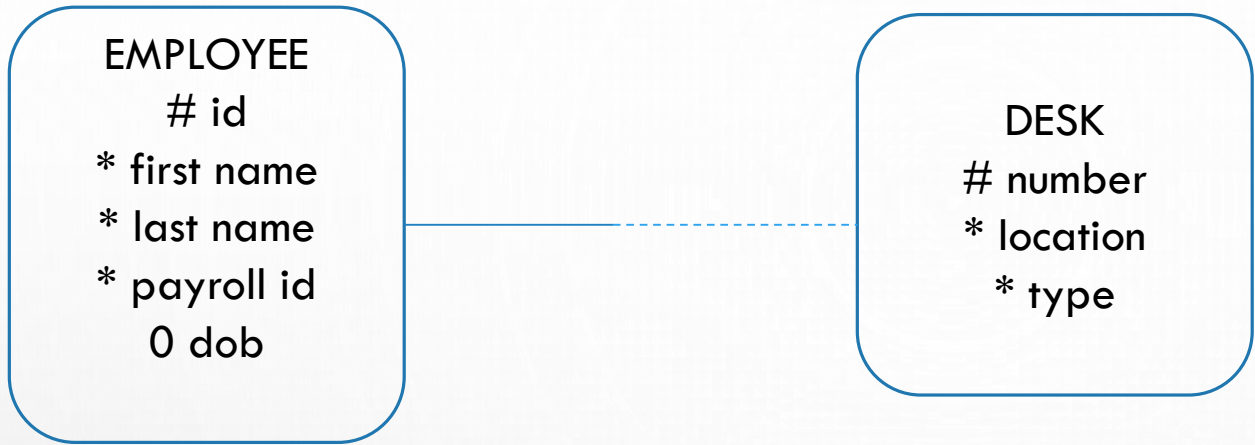
ACCOUNT
number
* balance
* date opened

BANK
number
* bank name
* address
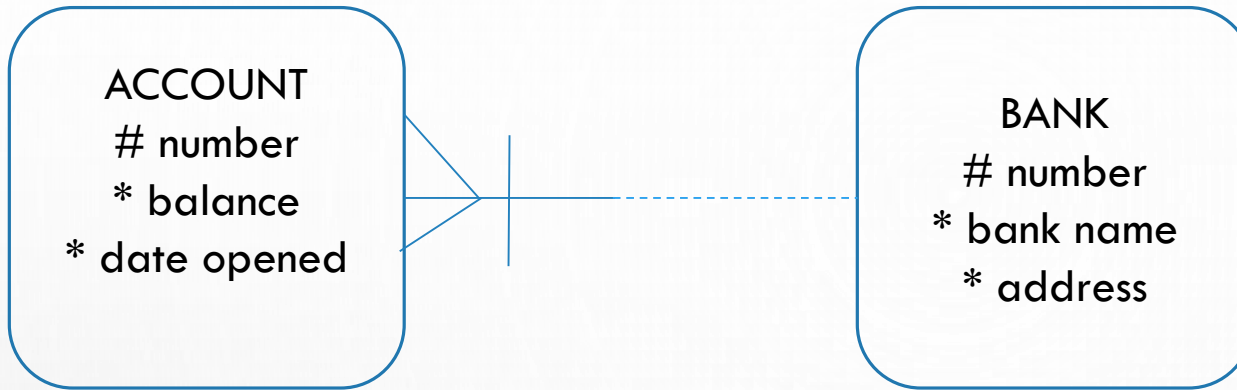
ACCOUNTS		
COLUMN NAME	DATA TYPE (SIZE)	CONSTRAINT

BANKS		
COLUMN NAME	DATA TYPE (SIZE)	CONSTRAINT

MAPPING ONE TO ONE RELATIONSHIPS

- WHEN TRANSFORMING A 1:1 RELATIONSHIP YOU CREATE A FOREIGN KEY AND A UNIQUE KEY

- ALL COLUMNS OF THIS FOREIGN KEY ARE ALSO PART OF THE UNIQUE KEY

- IF THE RELATIONSHIP IS MANDATORY ON ONE SIDE THE FOREIGN KEY IS PLACED IN THAT TABLE
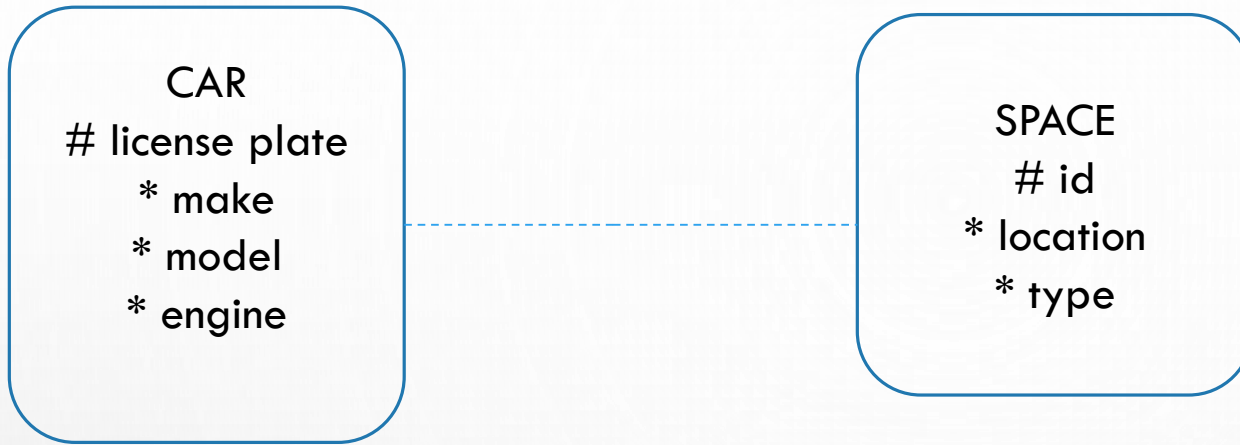
OPTIONAL ONE TO ONE RELATIONSHIPS

- IF THE RELATIONSHIP IS OPTIONAL ON BOTH SIDES, YOU CAN CHOOSE WHICH TABLE GETS THE FOREIGN KEY.

- THERE ARE NO ABSOLUTE RULES:
  - IMPLEMENT THE FOREIGN KEY IN THE TABLE WITH FEWER ROWS TO SAVE SPACE.
  - IMPLEMENT THE FOREIGN KEY WHERE IT MAKES MORE SENSE FOR THE BUSINESS

ONE TO MANY MANDATORY BOTH SIDES

- IF THE RELATIONSHIP IS MANDATORY AT BOTH ENDS, YOU HAVE THE SAME LIMITATION WHERE IT IS MANDATORY AT ONE END.

- YOU NEED TO WRITE ADDITIONAL CODE TO ENFORCE IT.