



RELATIONAL DATABASES

BASIC MAPPING

OBJECTIVES

- DISTINGUISH BETWEEN CONCEPTUAL MODEL AND PHYSICAL MODEL
- APPLY TERMINOLOGY MAPPING BETWEEN THE TWO MODELS
- TRANSFORM AN ENTITY INTO A TABLE DIAGRAM

PURPOSE

- WHEN YOU DESIGN A HOUSE YOU EVENTUALLY SEE THE HOUSE BUILT
- INITIAL DATABASE DESIGN CAN BE USED FOR FURTHER DISCUSSION BETWEEN DESIGNERS, DATABASE ADMINISTRATORS AND APPLICATION DEVELOPERS

RELATIONAL TABLES

- TABLES HAVE COLUMNS AND ROWS.
- EACH ROW DESCRIBES AN INSTANCE OF EMPLOYEE
- EACH COLUMN....
- UID...

Table: EMPLOYEES

The diagram shows a table with 6 columns and 5 rows. Red arrows point from the word 'columns' to each column header. Red arrows point from the word 'rows' to each row of data. Red arrows point from labels to specific columns: 'Primary Key Column (PK)' points to EMPLOYEE_ID, 'Foreign Key Column (FK)' points to DEPARTMENT_ID, and 'Unique Key Column (UK)' points to PAYROLL_ID.

EMPLOYEE_ID	LAST_NAME	FIRST_NAME	DEPARTMENT_ID	PAYROLL_ID	NICKNAME
100	SMITH	DANA	10	21215	Dana
310	ADAMS	TYLER	15	59877	Ty
210	CHEN	LAWRENCE	10	1101	Larry
405	GOMEZ	CARLOS	10	52	Chaz
378	LOUNGANI	NEIL	22	90386	Neil

Primary Key Column (PK)

Foreign Key Column (FK)

Unique Key Column (UK)

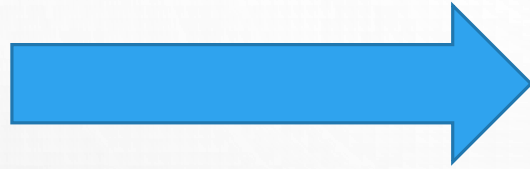
TRANSFORMATION

- ENTITY → TABLE
- INSTANCE → ROW
- ATTRIBUTE → COLUMN
- UID → PRIMARY KEY
- RELATIONSHIP → FOREIGN KEY & CONSTRAINT

TERMINOLOGY

ANALYSIS

ER Diagram



IMPLEMENTATION

Physical Design

Entity



Table

Instance



Row

Attribute



Column

Primary UID



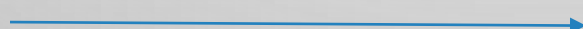
Primary key

Secondary UID



Unique key

Relationship



Foreign key

TABLE MAPPING DIAGRAM

[illegible]

Table Name

column name	key type	data type	size	description	optionality	constraints
emp_id	pk	number	9	employee id	*	
first_name		characters	20	employee first name	*	
....						
....						
email	uk	characters	40	employee personal email address	*	
dept_id	fk	number	9	link to departments table	*	

NAMING CONVENTIONS

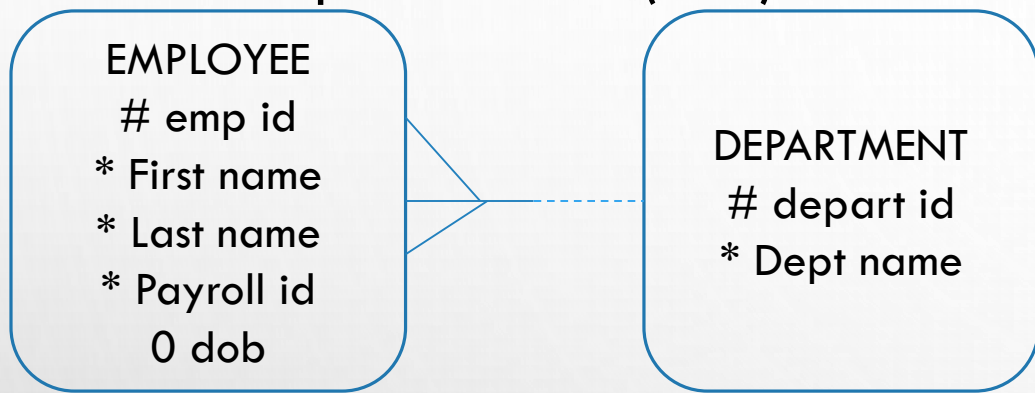
- ENTITY NAMES ARE USED AS TABLE NAMES BUT IN PLURAL FORM
- ATTRIBUTE NAME ARE USED FOR COLUMN NAMES WITH UNDERSCORES AND IN SOME CASES SHORT VERSIONS
- FIRST_NAME OR FNAME
- STREET_ADDRESS OR STR_ADDR

MYSQL NAMING RESTRICTIONS

- TABLE AND COLUMN NAMES :
 - CAN CONTAIN UP TO 64 ALPHANUMERIC CHARACTERS
 - CAN CONTAIN SPACES OR SPECIAL CHARACTERS BUT MUST THEN BE SURROUNDED BY QUOTES “”
 - TABLE NAMES MUST BE UNIQUE TO USER ACCOUNT
 - COLUMN NAME MUST BE UNIQUE TO TABLE
 - CANNOT USE RESERVED WORDS (SELECT, DELETE, BIGINT

TRANSFORMATION

Conceptual Model (ERD)



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