



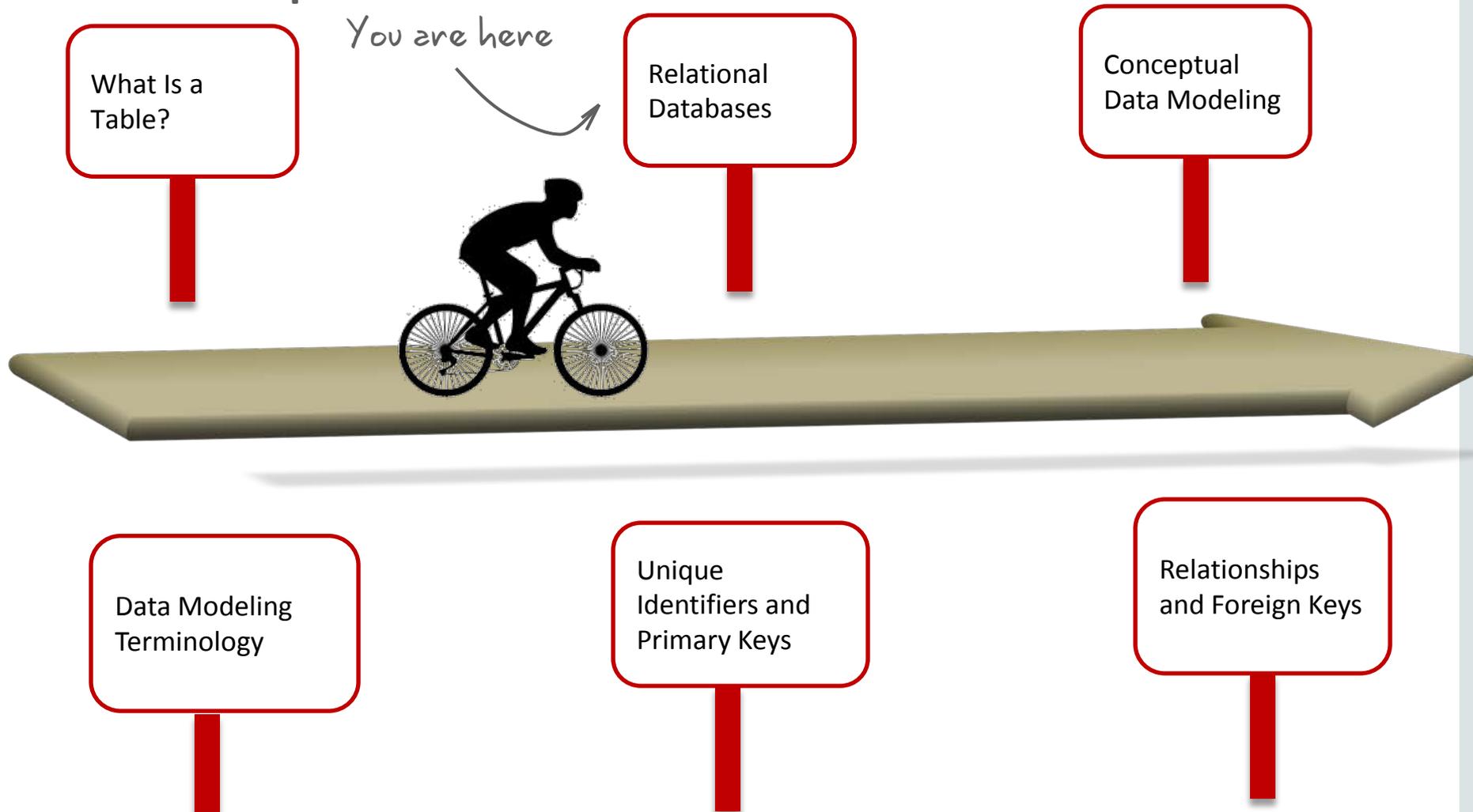
Database Foundations

2-2

Relational Databases



Roadmap



Objectives

This lesson covers the following objectives:

- Describe the features of a relational database
- Describe the advantages of a relational (multiple-table) database
- Define the relational tables and the key terms



Relational Databases

- A relational database presents information in tables with rows and columns.
- Each column represents a particular type of information (a field), and each row lists one record.
- The tables are then related to one another by using foreign keys.
- A foreign key is simply the primary key in a different table.



Relational Database: Example

STUDENTS



STUDENT_ID	LAST_NAME	DATE_OF_BIRTH	ADDRESS	COURSE_ID

COURSES

COURSE_ID	COURSE_NAME	COURSE_DURATION

Advantages of a Relational (Multiple-Table) Database

- Less redundancy
- Avoidance of inconsistency
- Efficiency
- Data integrity
- Confidentiality

Relational Tables

A table is a simple structure where data is organized and stored.

Table: **EMPLOYEES**

The diagram shows a table with 6 columns and 6 rows. A bracket labeled 'columns' spans the top of the columns. A bracket labeled 'rows' spans the left side of the rows. Below the table, three arrows point 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)

Relational Tables

MEMBERS

MEM_ID	FIRST_NAME	LAST_NAME	ADDRESS	CITY
.
.
.

AUTHORS

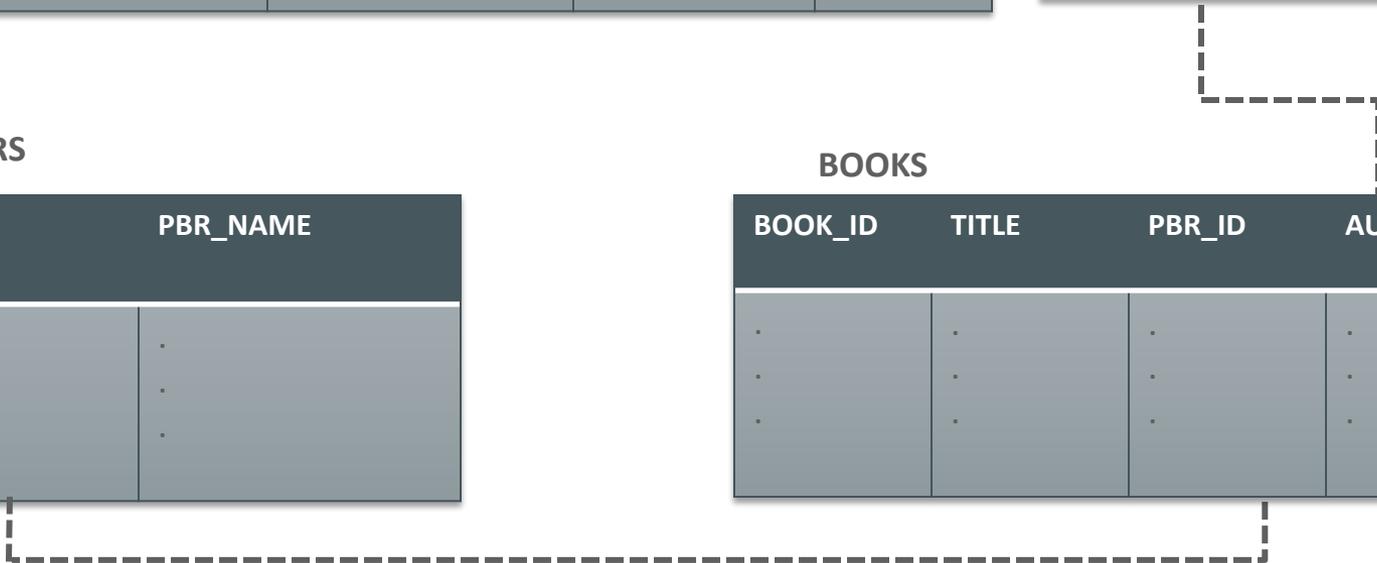
AUTH_ID	NAME
.	.
.	.
.	.

PUBLISHERS

PBR_ID	PBR_NAME
.	.
.	.
.	.

BOOKS

BOOK_ID	TITLE	PBR_ID	AUTH_ID
.	.	.	.
.	.	.	.
.	.	.	.



Key Terms

- Column
- Primary Key
- Foreign Key
- Row
- Field

Properties of Tables

A relational database has six table properties:

- **Property 1:** Entries in columns are single values.
- **Property 2:** Entries in columns are of the same kind.
- **Property 3:** Each row is unique.
- **Property 4:** Order of columns is insignificant.
- **Property 5:** Order of rows is insignificant.
- **Property 6:** Each column has a unique name.

Summary

In this lesson, you should have learned how to:

- Describe the features of a relational database
- Describe the advantages of a relational (multiple-table) database
- Define the relational tables and the key terms



