

# CPET 499/ITC 250 Web Systems

## Chapter 11 Working with Databases Part 1 of 3

### Text Book:

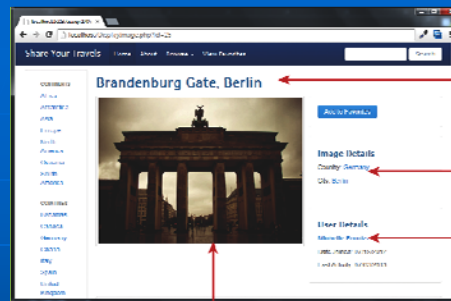
\* Fundamentals of Web Development, 2015, by Randy Connolly and Ricardo Hoar, published by Pearson

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## Topics

- Database and Web Development
  - The Role of Database in Web Development
  - Database Design
  - Database Options
- SQL (Structure Query Language)
  - SELECT Statement
  - INSERT, UPDATE, and DELETE Statements
  - Transactions: Local Transactions, Distributed Transactions
  - Data Definition Statements
  - Database Indexes and Efficiency

**Figure 11.1**  
Separating  
content from  
data



Content (data)  
varies but the  
markup (design)  
stays the same.

**Figure 11.2** How website use databases

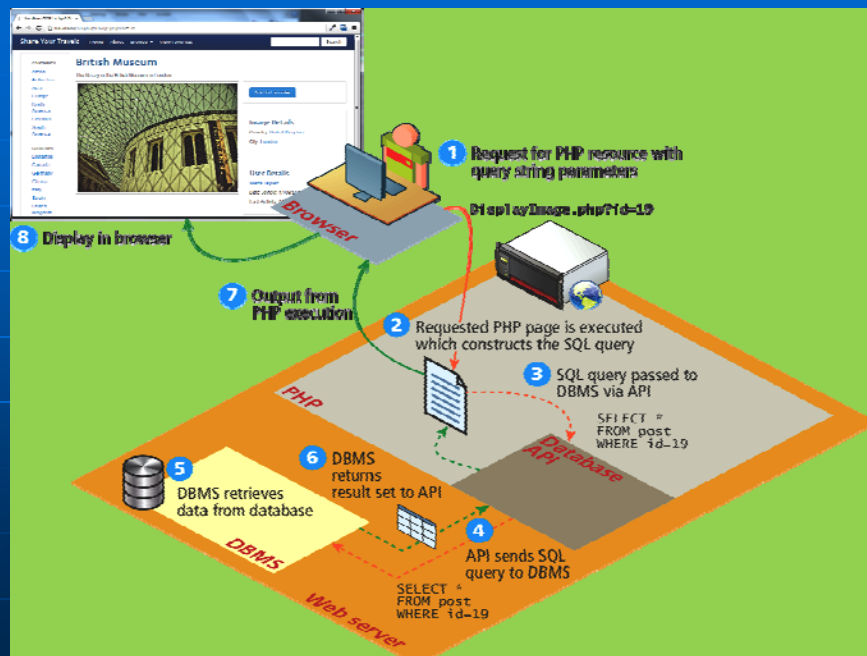


Figure 11.3 A database table

ArtWorkID	Title	Artist	YearOfWork
345	The Death of Marat	David	1793
400	The School of Athens	Raphael	1510
408	Bacchus and Ariadne	Titian	1520
425	Girl with a Pearl Earring	Vermeer	1665
438	Starry Night	Van Gogh	1889

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Figure 11.4 Diagramming a table

ArtWorks		ArtWorks		ArtWorks
ArtWorkID INT Title VARCHAR Artist VARCHAR YearOfWork INT		PK <u>ArtWorkID</u> Title Artist YearOfWork		<u>ArtWorkID</u> Title Artist YearOfWork

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**Table 11.1 Common Database Table Data Types**

- BIT
- BLOG – Binary Large Object
- CHAR(n) – a fixed number of character (n = number of chars) that are padded with spaces to fill the field
- DATE
- FLOAT, DOUBLE, DECIMAL
- INT, SMALLINT
- VARCHAR(n) – a variable number of characters (n = maximum number of chars with no space padding)

**Figure 11.5 Foreign keys links tables**

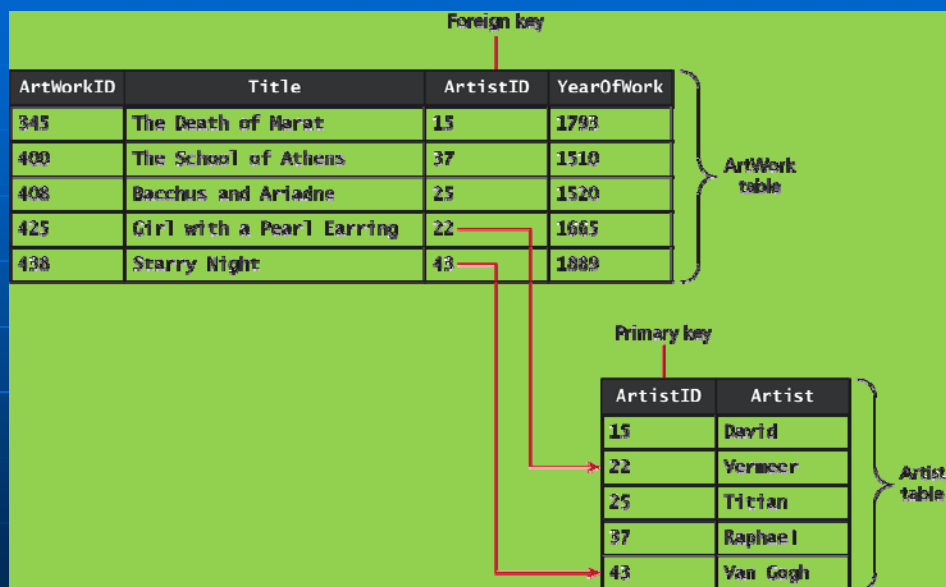


Figure 11.6 Diagramming a one-to-many relationship



Figure 11.7 Implementing a many-to-many relationship

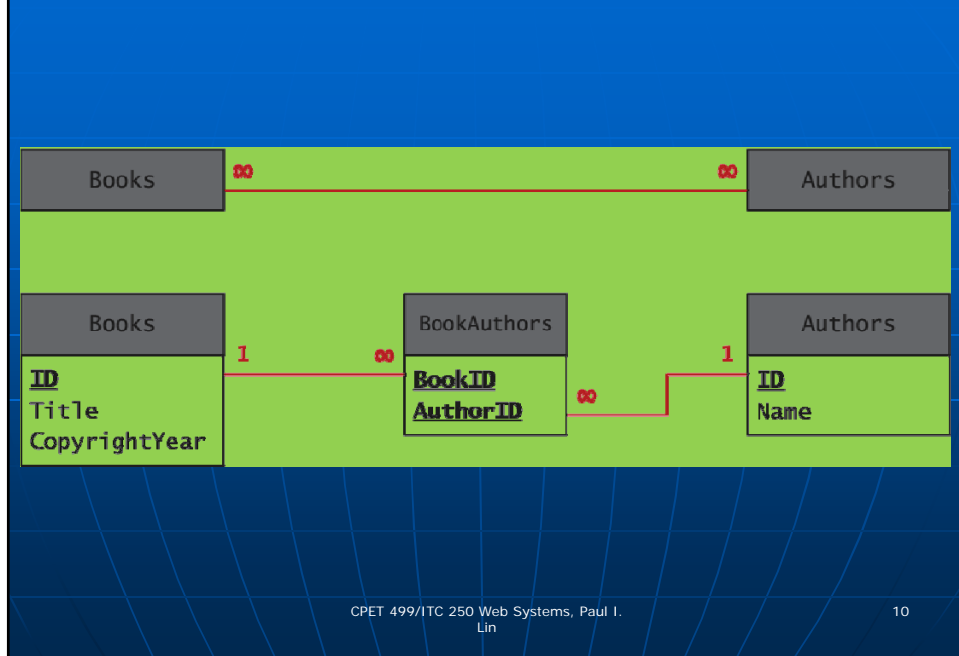


Figure 11.8 Database in the Enterprise

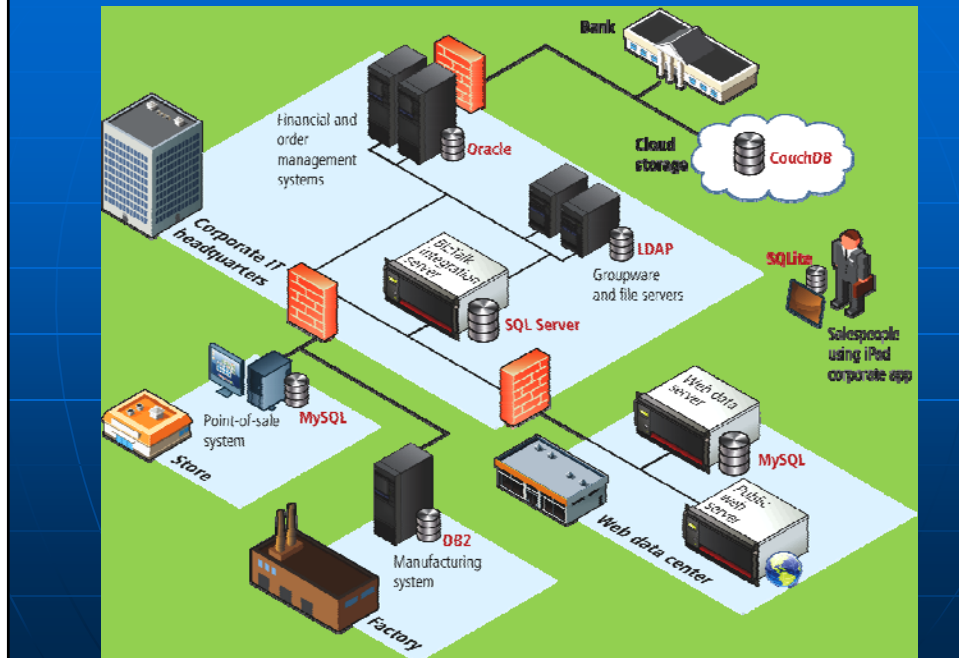
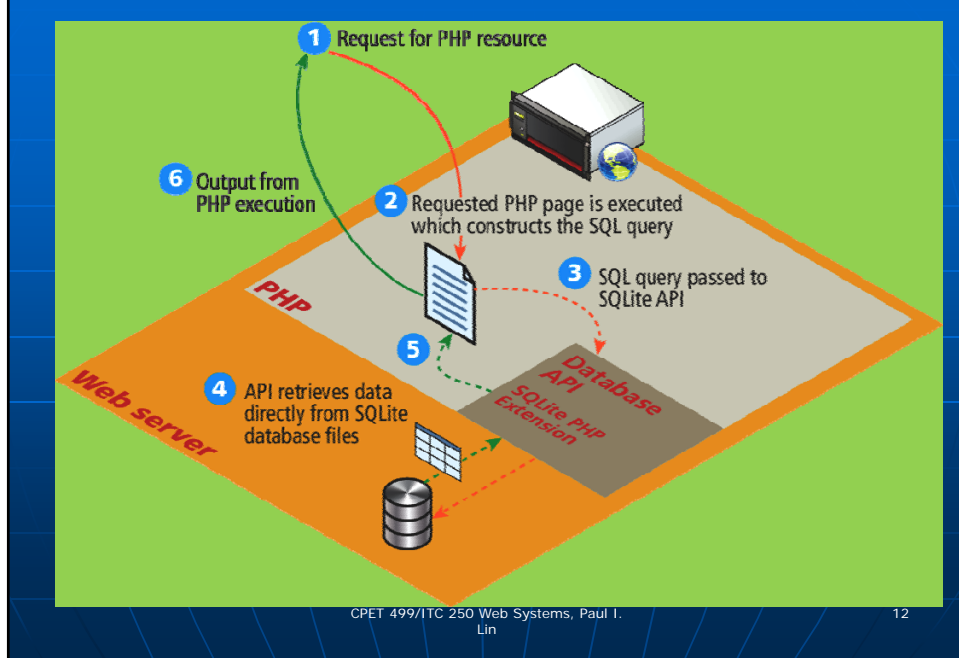
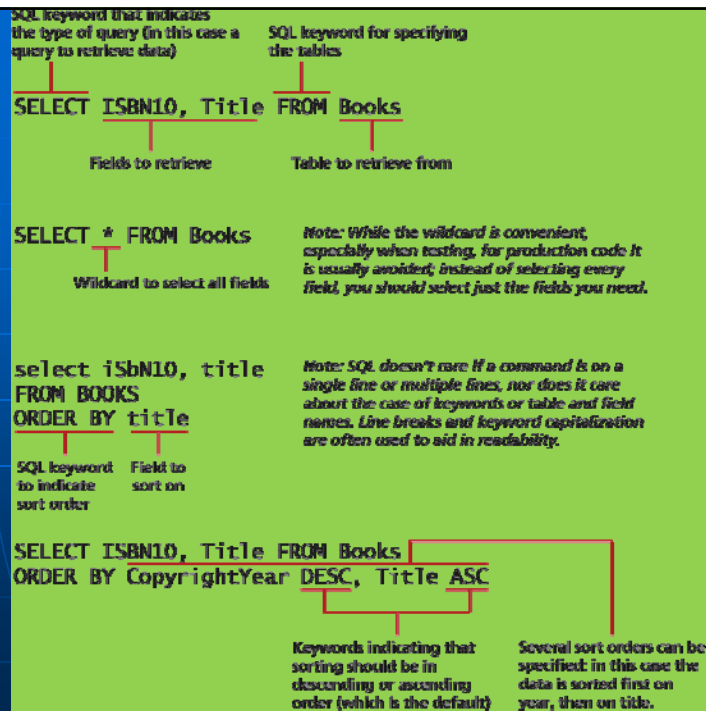


Figure 11.9 SQLite



**Figure 11.10 SQL SELECT from a single table**



**Figure 11.12 Using the WHERE clause**

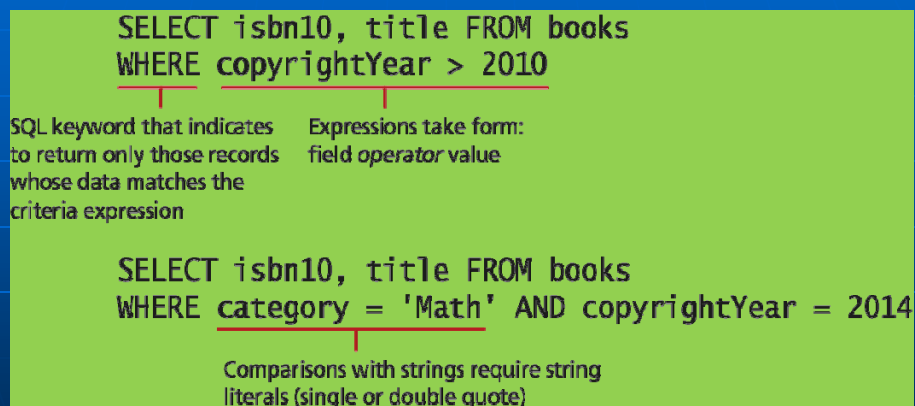


Figure 11.12 SQL SELECT from multiple table using an INNER JOIN

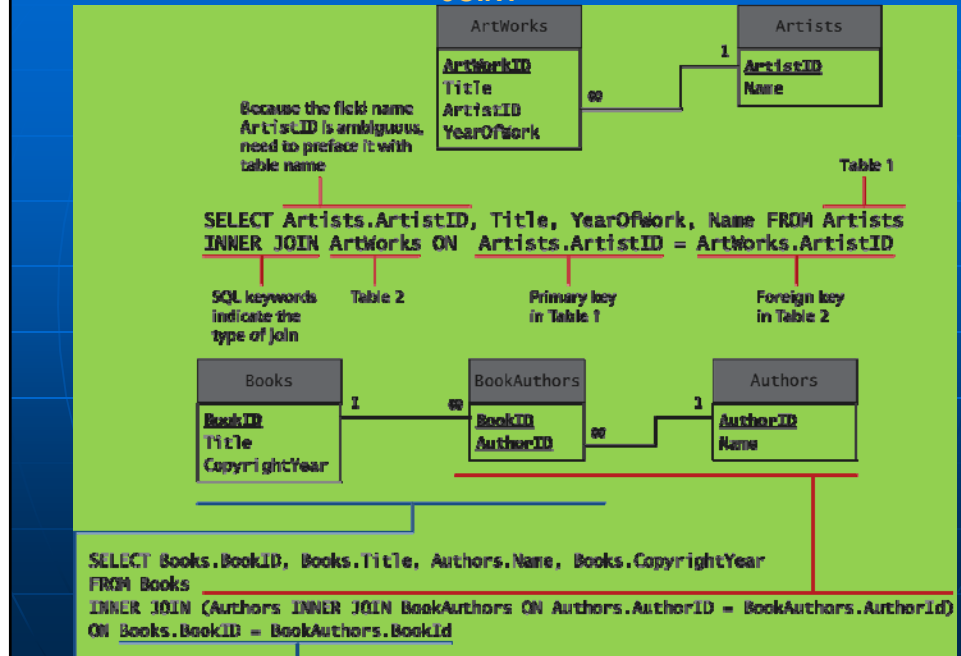


Figure 11.13 Using GROUP BY with aggregate functions

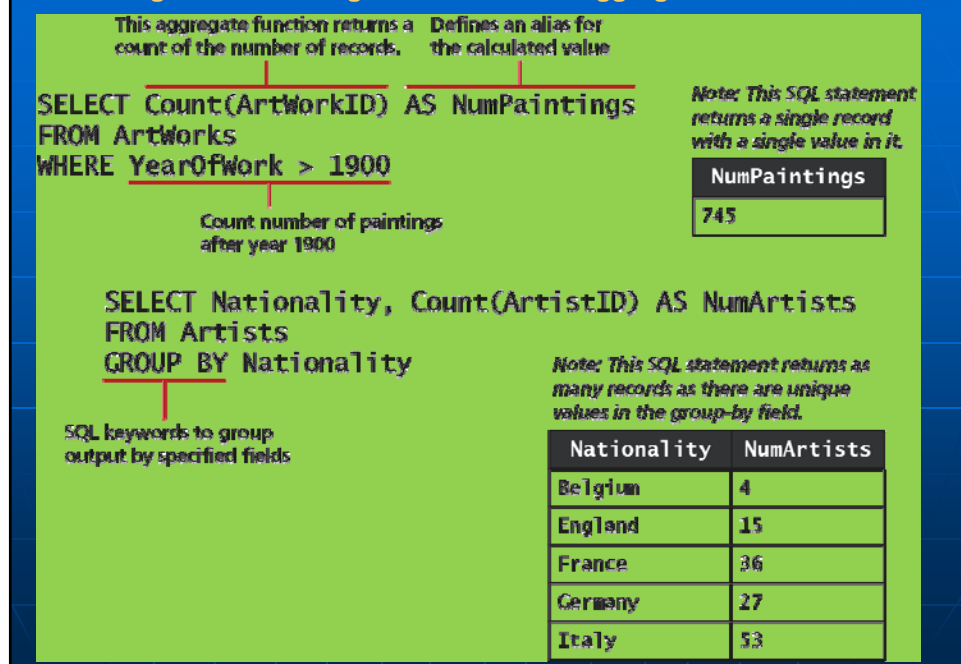
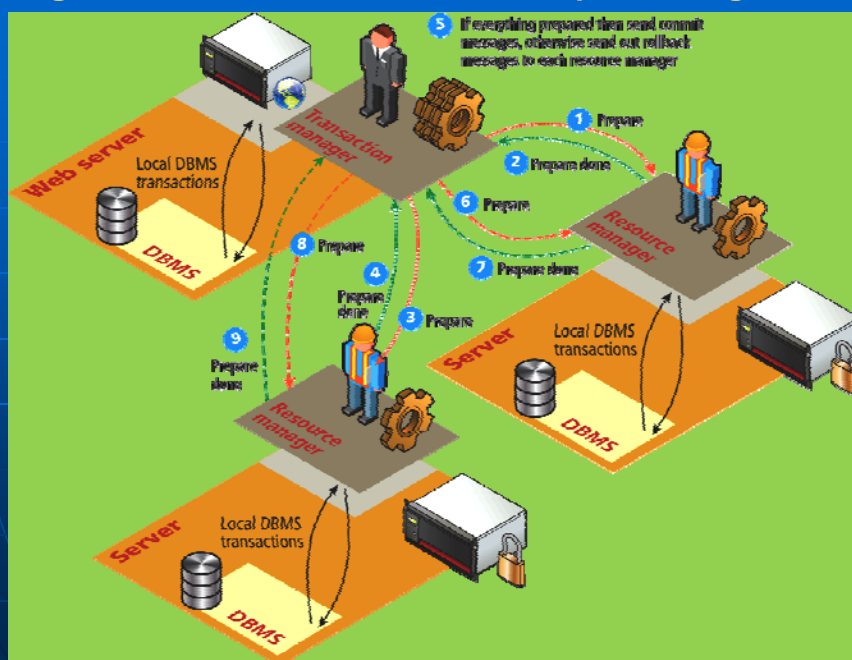




Figure 11.14 SQL INSET, UPDATE, and DELETE



Figure 11.15 Distributed transaction processing



## Figure 8.8 Zend Engine

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