

INLS 672

Web Development 2

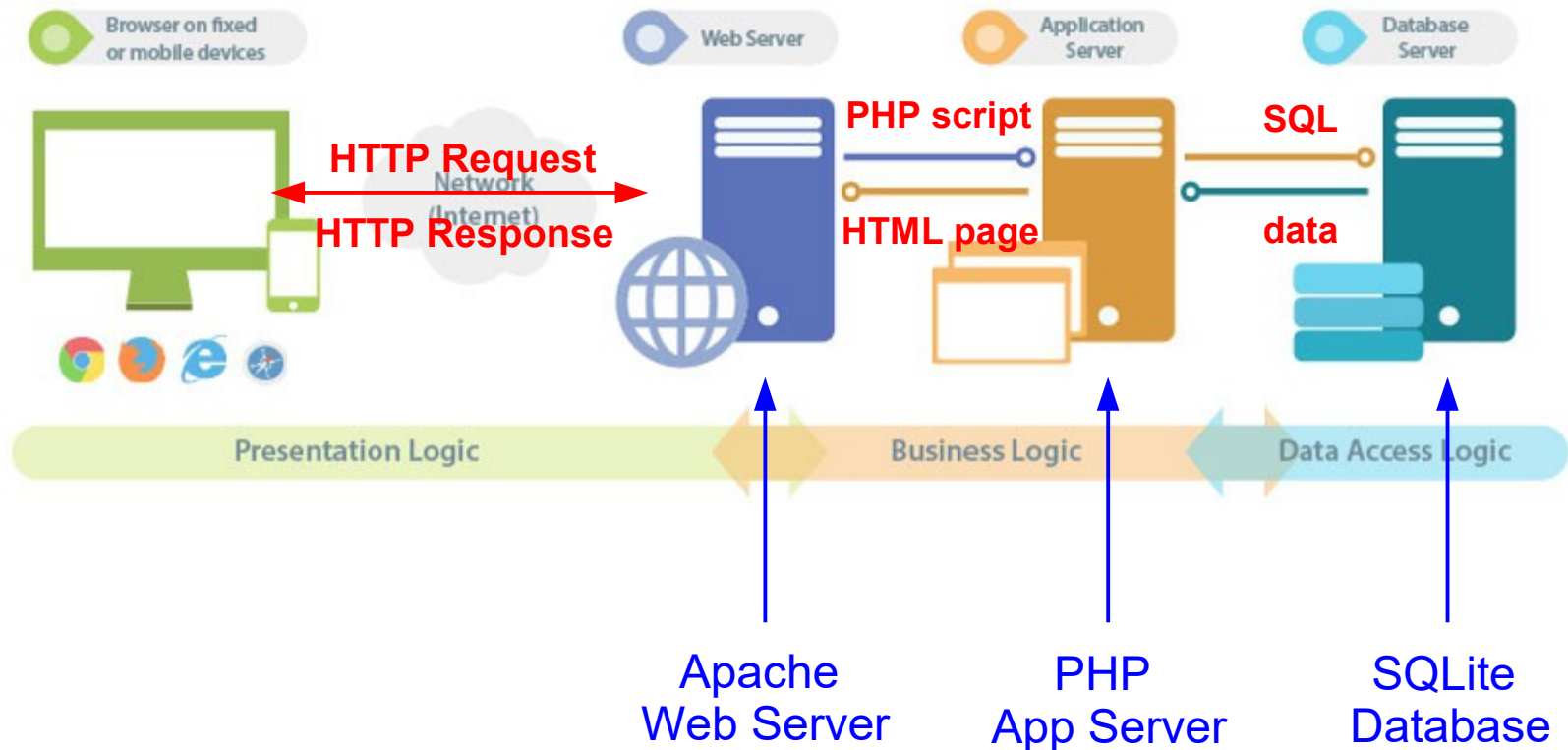
SQL, SQLite



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AND LIBRARY SCIENCE

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Web Development Environment



Basic SQL

Data Definition Language (DDL)

- Used to create database tables with attributes (or fields) and their data types using the CREATE TABLE statement
- Attribute data types
 - Character/text: VARCHAR, CHAR
 - Numeric: INT, DECIMAL
 - DATE, DATETIME
 - BOOLEAN

Data Manipulation Language (DML)

- Used to define retrieval queries with a SELECT statement
- Used to modify database contents with the INSERT, DELETE, and UPDATE statements

BOOKS Database

	ISBN	Title ▼ ¹	Author	Publisher	Format	Category	Description	Rating	
	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter	
1	978-1476746586	All the Light We Cannot See	Anthony Doerr	Scribner	eBook	Historical Fiction	From the highly acclaimed, multiple ...	5	
2	978-1556592461	Angle of Yaw	Ben Lerner	Copper Canyon Press	Audio	Poetry	In his bold second book, Ben Lerner ...	3	
3	978-0141302034	Dancing on the Edge	Han Nolan	Puffin	eBook	Children	Miracle McCloy has always known th...	4	
4	978-1556592010	Delights & Shadows	Ted Kooser	Vintage	eBook	Poetry	As Poet Laureate of the United State...	4	
5	978-0375726408	Empire Falls	Richard Russo	Vintage	eBook	Novel	Richard Russo—from his first novel, ...	3	
6	978-1594201653	Final Salute	Jim Sheeler	Penguin Press	Paperback	History	In Final Salute, Pulitzer Prize-winning...	5	
7	978-0375705243	Founding Brothers: A ...	Joseph J. Ellis	Vintage	Hardcover	History	In this landmark work of history, the ...	4	
8	978-1594203121	George F. Kennan: An ...	John Lewis Gaddis	Penguin Press HC	eBook	Biography	In the late 1940s, George Kennan ...	4	
9	978-0312424404	Gilead	Marilynne Robinson	Picador	Hardcover	Novel	An intimate tale of three generations...	5	
10	978-1400034093	Gulag: A History	Anne Applebaum	Anchor	Paperback	History	The Gulag—a vast array of Soviet ...	3	
11	978-0156027328	Life of Pi	Yann Martel	Mariner Books	Hardcover	Literary Fiction	The son of a zookeeper, Pi Patel has ...	5	
12	978-1555975845	Life on Mars	Tracy K. Smith	Graywolf Press	Paperback	Poetry	With allusions to David Bowie and ...	3	
13	978-0143120322	Malcolm X: A Life of ...	Manning Marable	Penguin Books	Paperback	Biography	Of the great figure in twentieth-centu...	4	
14	978-0143036661	March	Geraldine Brooks	Penguin Books	eBook	Literature	Brooks follows March as he leaves ...	3	
15	978-1451645859	Ordinary Grace	William Kent Krueger	Atria Books	Paperback	Fiction	From New York Times bestselling ...	4	
16	978-1501126062	Sing, Unburied, Sing	Jesmyn Ward	Scribner	Paperback	Fiction	An intimate portrait of a family and a...	5	
17	978-0316055444	The Goldfinch	CREATE TABLE "BOOK" ("ISBN" VARCHAR (20) NOT NULL, "Title" VARCHAR (50) NOT NULL, "Author" VARCHAR (20) NOT NULL, "Publisher" VARCHAR (20) NOT NULL, "Format" VARCHAR (20) NOT NULL, "Category" VARCHAR (20) NOT NULL, "Description" VARCHAR, "Rating" INTEGER NOT NULL DEFAULT 0, PRIMARY KEY ("ISBN"));					grieving the dea...	4
18	978-0061673740	The Grass is Sin						esia under whit...	5
19	978-0679744993	The Haunted La						ining look at the...	3
20	978-1616208042	The Leavers						China, The ...	5

SQL DDL to
create the
BOOK table

Basic SQL Operations (DML)

Retrieve all rows in the BOOK table

```
SELECT * FROM BOOK
```

Insert a new book into the BOOK table

```
INSERT INTO BOOK VALUES  
('123-0000000000', 'New Title', 'New Author',  
 'Some publisher', 'eBook', 'Fiction',  
 'Description goes here ', 4);
```

Update salaries in department 5

```
UPDATE BOOK SET Category = 'Novel'  
WHERE ISBN = '123-0000000000';
```

Delete a Book

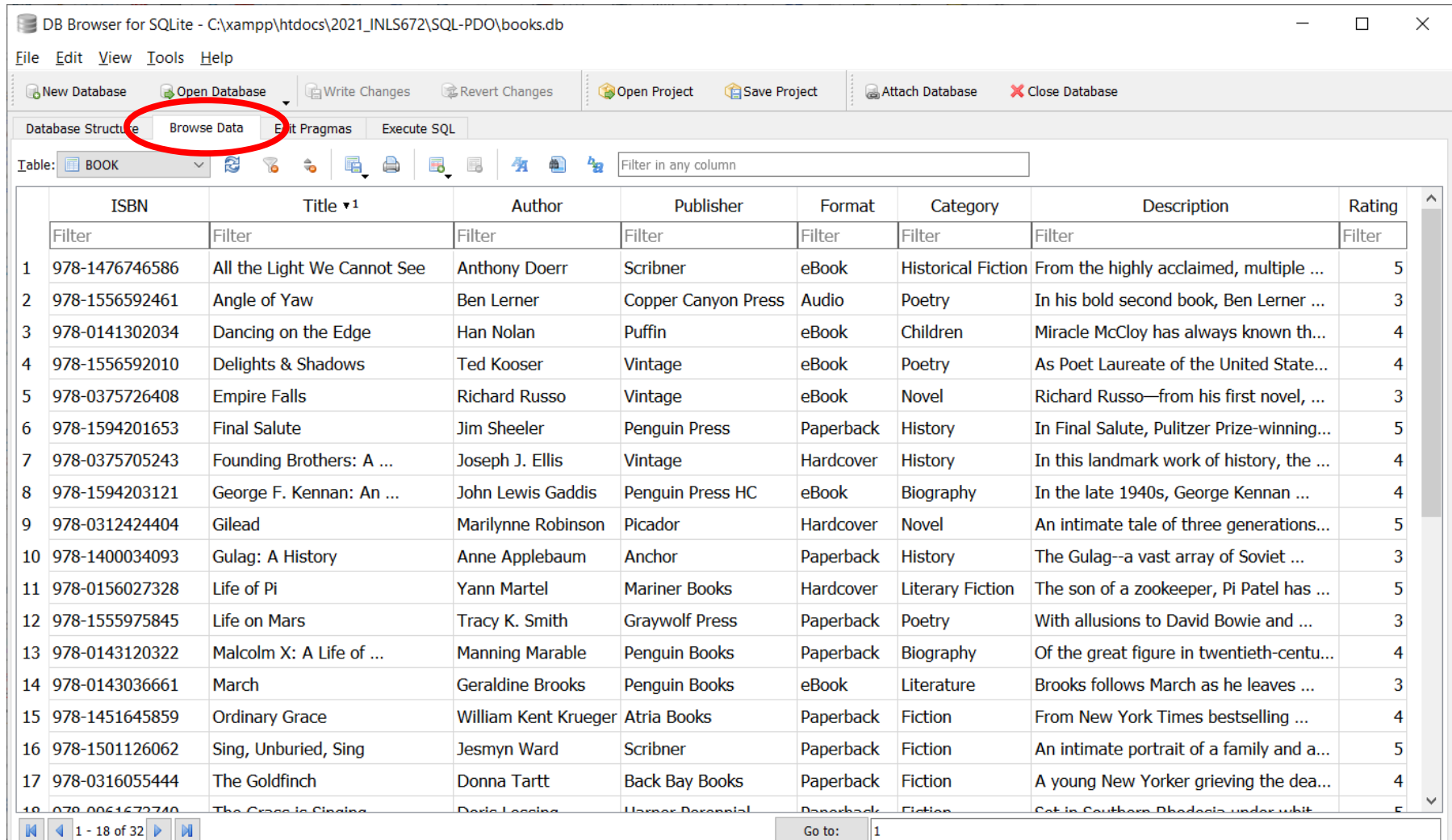
```
DELETE FROM BOOK WHERE ISBN='123-0000000000';
```

SQLite Introduction

- **Features**
 - Self-contained, full-featured SQL database engine
 - Compact, portable, and reliable
 - Serverless, with zero-configuration
 - Most widely deployed and used database engine
- **Well-known users**
- Has a command line interface, but a more user-friendly tool is **DB Browser for SQLite**

Using DB Browser for SQLite

Select the *File* menu, *Open Database...*, and navigate to the folder containing **books.db**



The screenshot shows the DB Browser for SQLite application window. The title bar indicates the file path: C:\xampp\htdocs\2021_INLS672\SQL-PDO\books.db. The menu bar includes File, Edit, View, Tools, and Help. The toolbar contains icons for New Database, Open Database, Write Changes, Revert Changes, Open Project, Save Project, Attach Database, and Close Database. The 'Open Database' button is highlighted with a red circle. Below the toolbar, the 'Database Structure' tab is active, showing a table named 'BOOK'. The table has columns for ISBN, Title, Author, Publisher, Format, Category, Description, and Rating. The table contains 18 rows of data, with the first row being 'All the Light We Cannot See' by Anthony Doerr.

	ISBN	Title ▼ ¹	Author	Publisher	Format	Category	Description	Rating
	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
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18	978-0061672740	The Grass Is Singing	Doris Lessing	Harper Perennial	Paperback	Fiction	Set in Southern Rhodesia under white...	5

Executing a SQL Query

Find all books about Poetry

```
SELECT * FROM BOOK WHERE Category='Poetry'
```

The screenshot shows the DB Browser for SQLite interface. The title bar indicates the database file is 'C:\xampp\htdocs\2021_INLS672\SQL-PDO\books.db'. The menu bar includes File, Edit, View, Tools, and Help. The toolbar contains buttons for New Database, Open Database, Write Changes, Revert Changes, Open Project, Save Project, Attach Database, and Close Database. The 'Execute SQL' button is circled in red. Below the toolbar, the 'SQL 1' tab is active, showing the query: `SELECT * FROM BOOK WHERE Category='Poetry'`. A red arrow points to the 'Execute SQL' button with the text 'Click to execute the query'. Another red arrow points to the query text with the text 'Enter SQL query'. The results are displayed in a table with 9 columns: ISBN, Title, Author, Publisher, Format, Category, Description, and Rating. The table contains 5 rows of data. At the bottom, a status bar indicates 'Execution finished without errors. Result: 5 rows returned in 11ms. At line 1: SELECT * FROM BOOK WHERE Category='Poetry''.

DB Browser for SQLite - C:\xampp\htdocs\2021_INLS672\SQL-PDO\books.db

File Edit View Tools Help

New Database Open Database Write Changes Revert Changes Open Project Save Project Attach Database Close Database

Database Structure Browse Data Edit Pragma Execute SQL

SQL 1

```
1 SELECT * FROM BOOK WHERE Category='Poetry'
```

	ISBN	Title	Author	Publisher	Format	Category	Description	Rating
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2	978-1556593109	The Shadow of Sirius	W.S. Merwin	Copper Canyon Press	Paperback	Poetry	"A collection of luminous, often tende...	5
3	978-1556592010	Delights & Shadows	Ted Kooser	Vintage	eBook	Poetry	As Poet Laureate of the United State...	4
4	978-1933527147	Without Saying	Richard Howard	Turtle Point Press	Audio	Poetry	In Richard Howard's new collection, ...	5
5	978-1556592461	Angle of Yaw	Ben Lerner	Copper Canyon Press	Audio	Poetry	In his bold second book, Ben Lerner ...	3

Execution finished without errors.
Result: 5 rows returned in 11ms
At line 1:
SELECT * FROM BOOK WHERE Category='Poetry'

UTF-8