

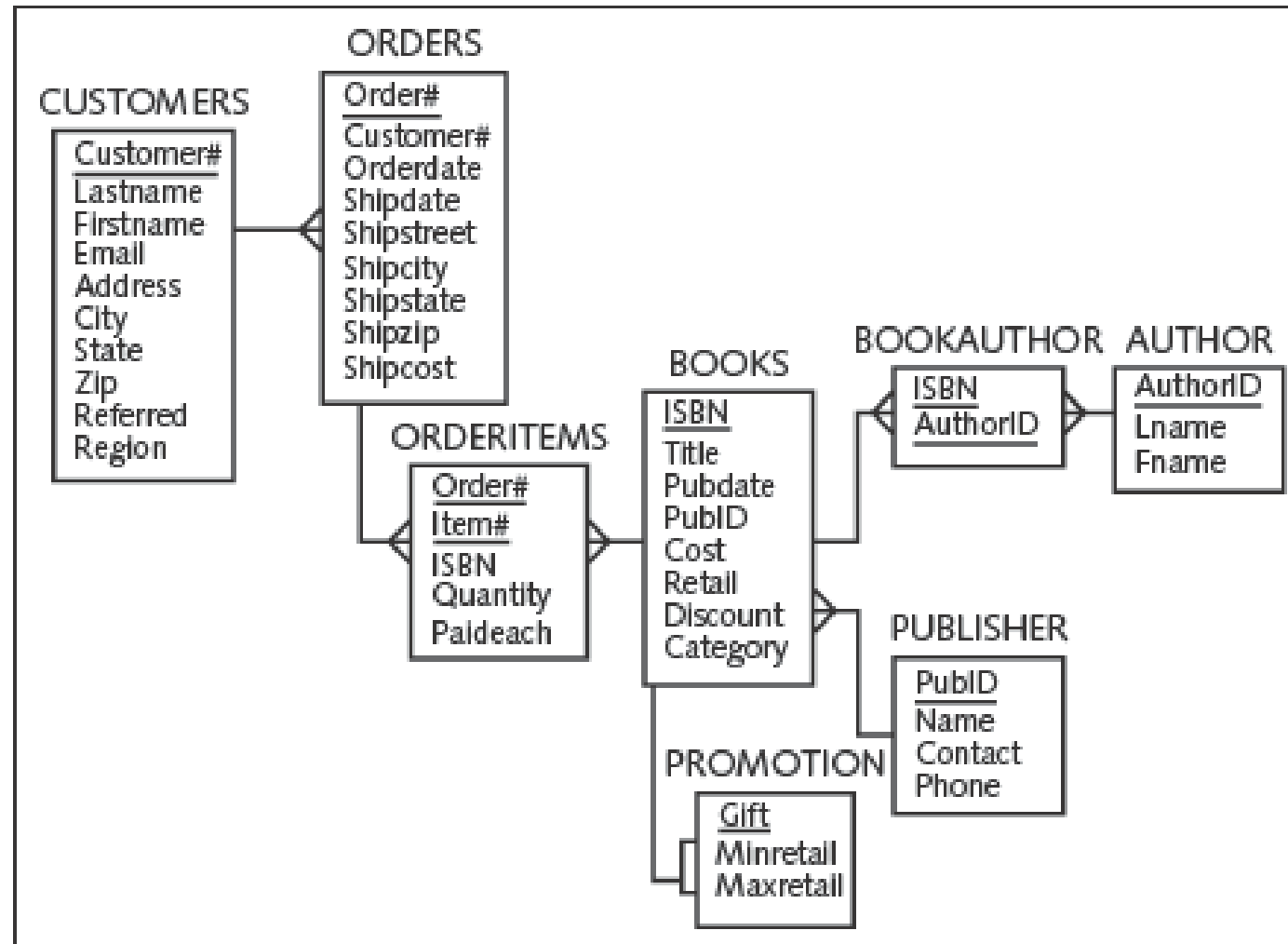
Database Systems

Basic SELECT Statements

CS 630 Database Systems

Professor Nardi

Normalized JustLee Books Database...



SELECT Statement Syntax – Part 1...

- Used to Retrieve Data From a Database...
- Referred to as a Query...
- Format is Always SELECT ***what data*** FROM ***which tables*** WHERE ***what condition(s) is true...***
- No Matter How Complicated It Make Get, This is ALWAYS the Basic Structure...

```
SELECT  [DISTINCT | UNIQUE] (*, columnname [ AS alias], ...)  
        FROM      tablename  
        [WHERE     condition]  
        [GROUP BY  group_by_expression]  
        [HAVING    group_condition]  
        [ORDER BY  columnname];
```

SELECT Statement Syntax – Part 2...

- SELECT and FROM Clauses Are Required...
- SELECT Clause Identifies Column(s)...
- FROM Clause Identifies Table(s)...
- WHERE Clause is Optional...

```
SELECT  [DISTINCT | UNIQUE] (*, columnname [ AS alias], ...)  
FROM    tablename  
[WHERE  condition]  
[GROUP BY group_by_expression]  
[HAVING group_condition]  
[ORDER BY columnname];
```

Selecting One Column From a Table...

- Enter the Column Name in the SELECT Clause...

Enter SQL Statement:

```
SELECT title  
FROM books;
```

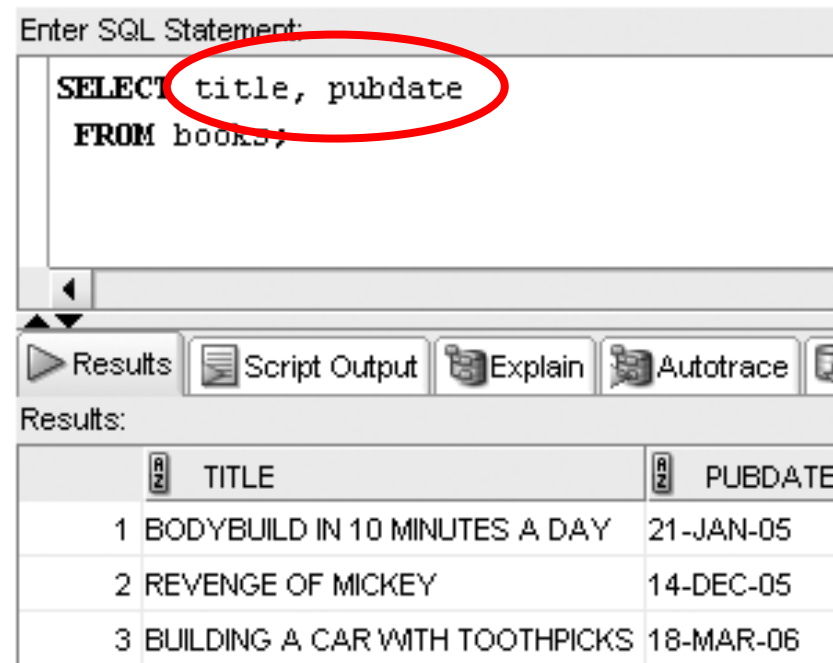
Results Script Output Explain An

Results:

	TITLE
1	BODYBUILD IN 10 MINUTES A DAY
2	REVENGE OF MICKEY

Selecting Multiple Columns From a Table...

- Enter the Column Names in the SELECT Clause...
- Separate Column Names With a Comma...

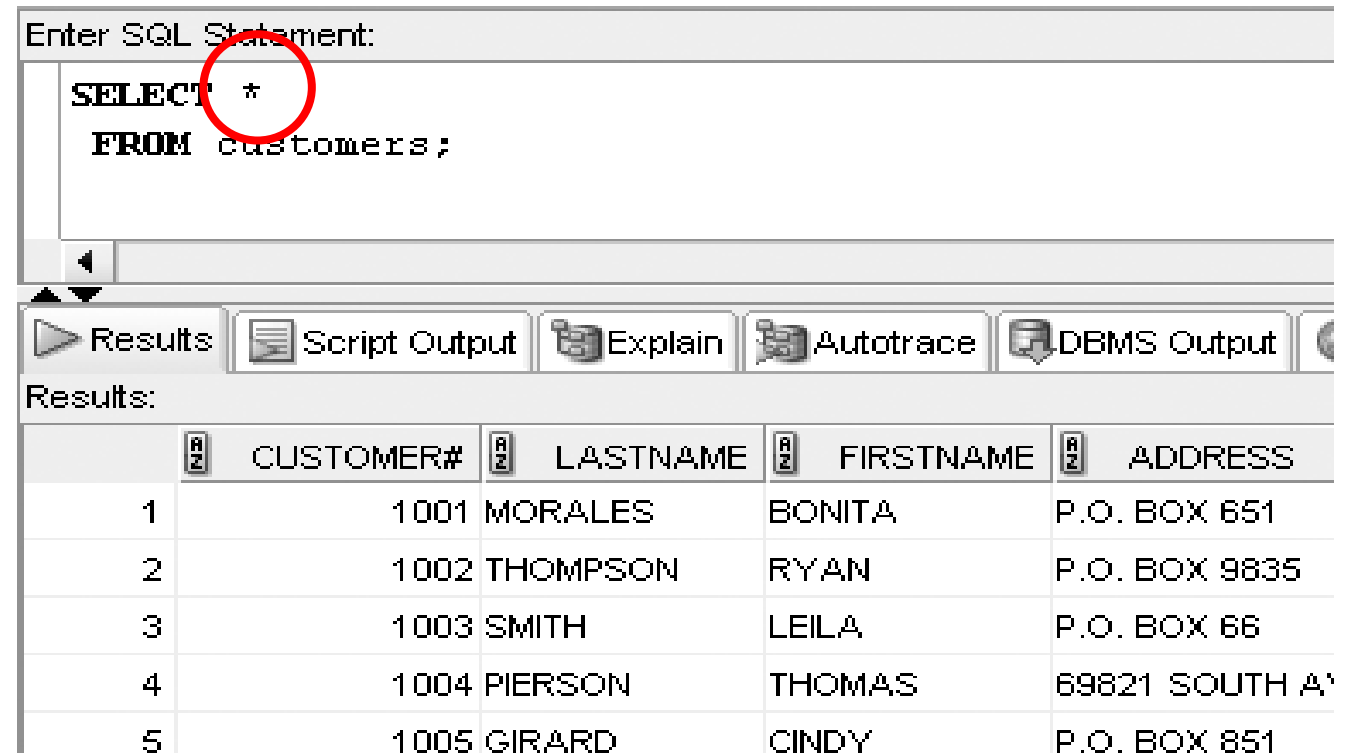


The screenshot shows a SQL query interface. At the top, a text box labeled "Enter SQL Statement:" contains the query: `SELECT title, pubdate` and `FROM books;`. The text `title, pubdate` is circled in red. Below the text box is a toolbar with buttons for "Results", "Script Output", "Explain", and "Autotrace". The "Results" button is selected, and the results are displayed in a table below. The table has two columns: "TITLE" and "PUBDATE". The results are as follows:

	TITLE	PUBDATE
1	BODYBUILD IN 10 MINUTES A DAY	21-JAN-05
2	REVENGE OF MICKEY	14-DEC-05
3	BUILDING A CAR WITH TOOTHPICKS	18-MAR-06

Selecting All Data In a Table...

- Substitute an Asterisk for the Column Names in a SELECT Clause...
- Returns ALL Data From EVERY Column...
- ***NEVER USE THE "*"...***
- ***NEVER NEVER USE IT!...***



The screenshot shows a SQL query interface. The top section is labeled "Enter SQL Statement:" and contains the text "SELECT * FROM customers;". The asterisk (*) is circled in red. Below the query input is a toolbar with buttons for "Results", "Script Output", "Explain", "Autotrace", and "DBMS Output". The "Results" button is selected, and the results are displayed in a table below. The table has five columns: "CUSTOMER#", "LASTNAME", "FIRSTNAME", and "ADDRESS". The first column is labeled "Results:" and contains numbers 1 through 5. The data rows are as follows:

	AZ	CUSTOMER#	AZ	LASTNAME	AZ	FIRSTNAME	AZ	ADDRESS
1		1001		MORALES		BONITA		P.O. BOX 651
2		1002		THOMPSON		RYAN		P.O. BOX 9835
3		1003		SMITH		LEILA		P.O. BOX 66
4		1004		PIERSON		THOMAS		69821 SOUTH A'
5		1005		GIRARD		CINDY		P.O. BOX 851

Operations Within the SELECT Statement...

- Use Column Alias For Column Headings...
- Perform Arithmetic Operations...
- Suppress Duplicates...
- Concatenate Data...

Using Column Aliases...

- List the Alias After the Column Heading...
- AS Keyword Is Optional...
- Enclose in Double Quotation Marks:
 - If It Contains Blank Space(s)...
 - If It Contains Special Symbol(s)...
 - To Retain Case...

Enter SQL Statement:

```
SELECT title AS "Title of Book", category  
FROM books;
```

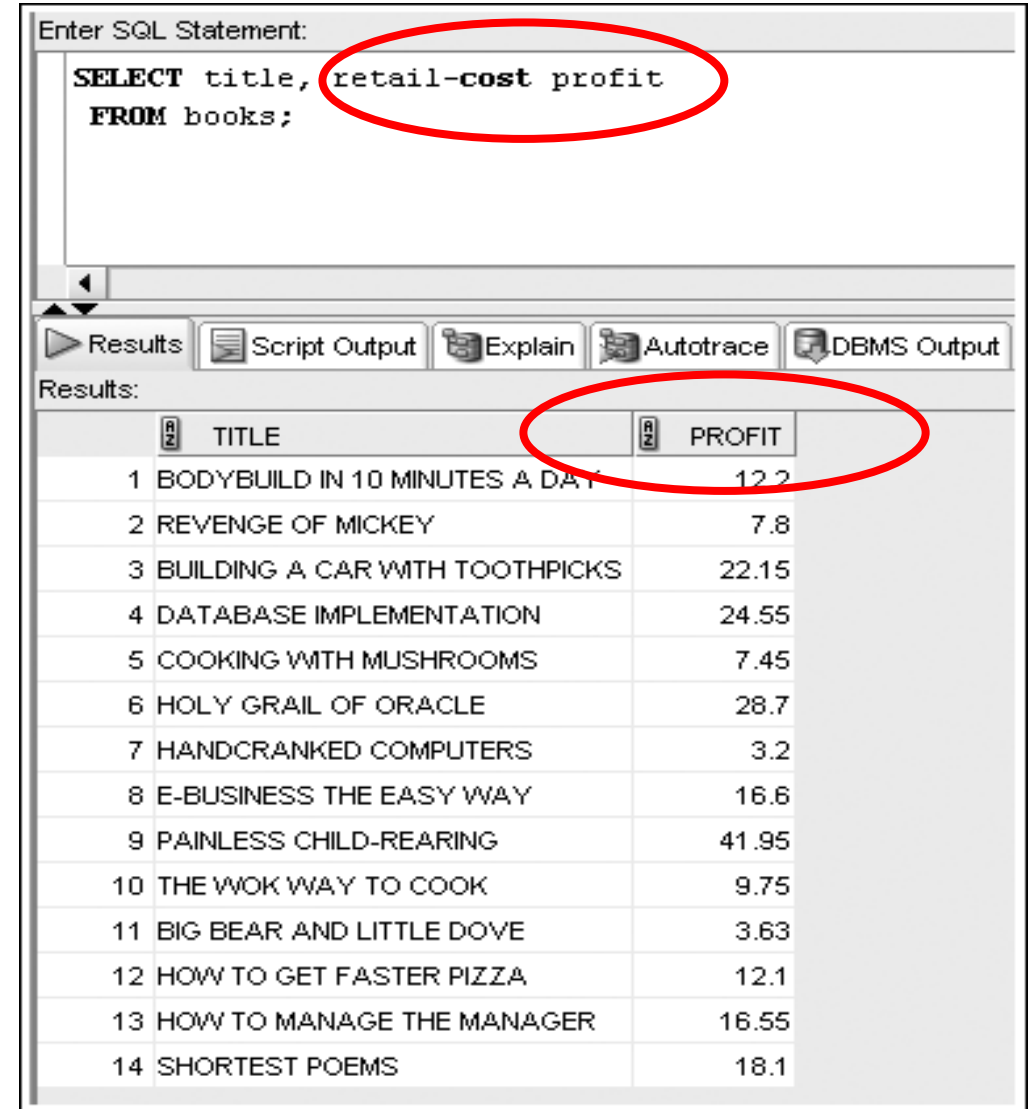
Results Script Output Explain Autotrace DBMS Output

Results:

	A2 Title of Book	A2 CATEGORY
1	BODYBUILD IN 10 MINUTES A DAY	FITNESS
2	REVENGE OF MICKEY	FAMILY LIFE
3	BUILDING A CAR WITH TOOTHPICKS	CHILDREN
4	DATABASE IMPLEMENTATION	COMPUTER
5	COOKING WITH MUSHROOMS	COOKING
6	HOLY GRAIL OF ORACLE	COMPUTER
7	HANDCRANKED COMPUTERS	COMPUTER
8	E-BUSINESS THE EASY WAY	COMPUTER
9	PAINLESS CHILD-REARING	FAMILY LIFE
10	THE WOK WAY TO COOK	COOKING
11	BIG BEAR AND LITTLE DOVE	CHILDREN
12	HOW TO GET FASTER PIZZA	SELF HELP
13	HOW TO MANAGE THE MANAGER	BUSINESS
14	SHORTEST POEMS	LITERATURE

Using Arithmetic Operations...

- Arithmetic Operations...
 - Executed Left To Right...
 - Multiplication and Division Are Solved First...
 - Addition and Subtraction Are Solved Last...
 - ***ALWAYS USE PARENTHESES TO GUARANTEE ORDER...***
- Use a Column Alias For Display Purposed...



The screenshot shows a SQL query execution window. The query entered is `SELECT title, retail-cost profit FROM books;`. The `retail-cost profit` expression is circled in red. Below the query, there are buttons for `Results`, `Script Output`, `Explain`, `Autotrace`, and `DBMS Output`. The `Results` button is selected, and the results are displayed in a table. The table has two columns: `TITLE` and `PROFIT`. The `PROFIT` column is circled in red. The results are as follows:

	TITLE	PROFIT
1	BODYBUILD IN 10 MINUTES A DAY	12.2
2	REVENGE OF MICKEY	7.8
3	BUILDING A CAR WITH TOOTHPICKS	22.15
4	DATABASE IMPLEMENTATION	24.55
5	COOKING WITH MUSHROOMS	7.45
6	HOLY GRAIL OF ORACLE	28.7
7	HANDCRANKED COMPUTERS	3.2
8	E-BUSINESS THE EASY WAY	16.6
9	PAINLESS CHILD-REARING	41.95
10	THE WOK WAY TO COOK	9.75
11	BIG BEAR AND LITTLE DOVE	3.63
12	HOW TO GET FASTER PIZZA	12.1
13	HOW TO MANAGE THE MANAGER	16.55
14	SHORTEST POEMS	18.1

NULL Values...

- Represents an Unknown or a Missing Value...
- **A NULL VALUE DOES NOT MEAN A ZERO OR AN EMPTY TEXT STRING...**
- Zero (0) Can Have Meaning...i.e., the Balance of a Bank Account, Amount of a Product in Stock...
- A Blank Space is a Valid Character...i.e., City Is Not Part of a Country, Someone Has No Middle Initial...

Why Use NULLS?

- **AGAIN...NULL VALUE DOES NOT MEAN A ZERO OR AN EMPTY TEXT STRING...**
- Can Be Useful in Determining Whether or Not Data Has Been Entered for a Value...i.e., If Someone Does Not Have a Middle Name, the Field Can Be Null...If You Are Uncertain What Category Something Belongs to You Can Leave it NULL Until You Find Out...
- Numbers Can Be NULL...But Using NULLS in a Calculation Results in a NULL Value...
- Functions Can Be Used to Replace NULL Values With a 0 (Much More on That Later)...

NULL Value Example...

- Is It Desirable to Have a Discount of NULL?...
- Do You Want to Show \$0 Instead?...
- This Will Help You to Determine If a Field Can/Should Be NULL?...
- Remember to Define NULL When Creating the Table...

Enter SQL Statement:

```
SELECT title, retail, discount, retail-discount  
FROM books;
```

Results Script Output Explain Autotrace DBMS Output OWA Output

Results:

	TITLE	RETAIL	DISCOUNT	RETAIL-DISCOUNT
1	BODYBUILD IN 10 MINUTES A DAY	30.95	(null)	(null)
2	REVENGE OF MICKEY	22	(null)	(null)
3	BUILDING A CAR WITH TOOTHPICKS	59.95	3	56.95
4	DATABASE IMPLEMENTATION	55.95	(null)	(null)
5	COOKING WITH MUSHROOMS	19.95	(null)	(null)
6	HOLY GRAIL OF ORACLE	75.95	3.8	72.15
7	HANDCRANKED COMPUTERS	25	(null)	(null)
8	E-BUSINESS THE EASY WAY	54.5	(null)	(null)
9	PAINLESS CHILD-REARING	89.95	4.5	85.45
10	THE WOK WAY TO COOK	28.75	(null)	(null)
11	BIG BEAR AND LITTLE DOVE	8.95	(null)	(null)
12	HOW TO GET FASTER PIZZA	29.95	1.5	28.45
13	HOW TO MANAGE THE MANAGER	31.95	(null)	(null)
14	SHORTEST POEMS	39.95	(null)	(null)

DISTINCT vs. UNIQUE...

Enter SQL Statement:

```
SELECT DISTINCT state  
FROM customers;
```

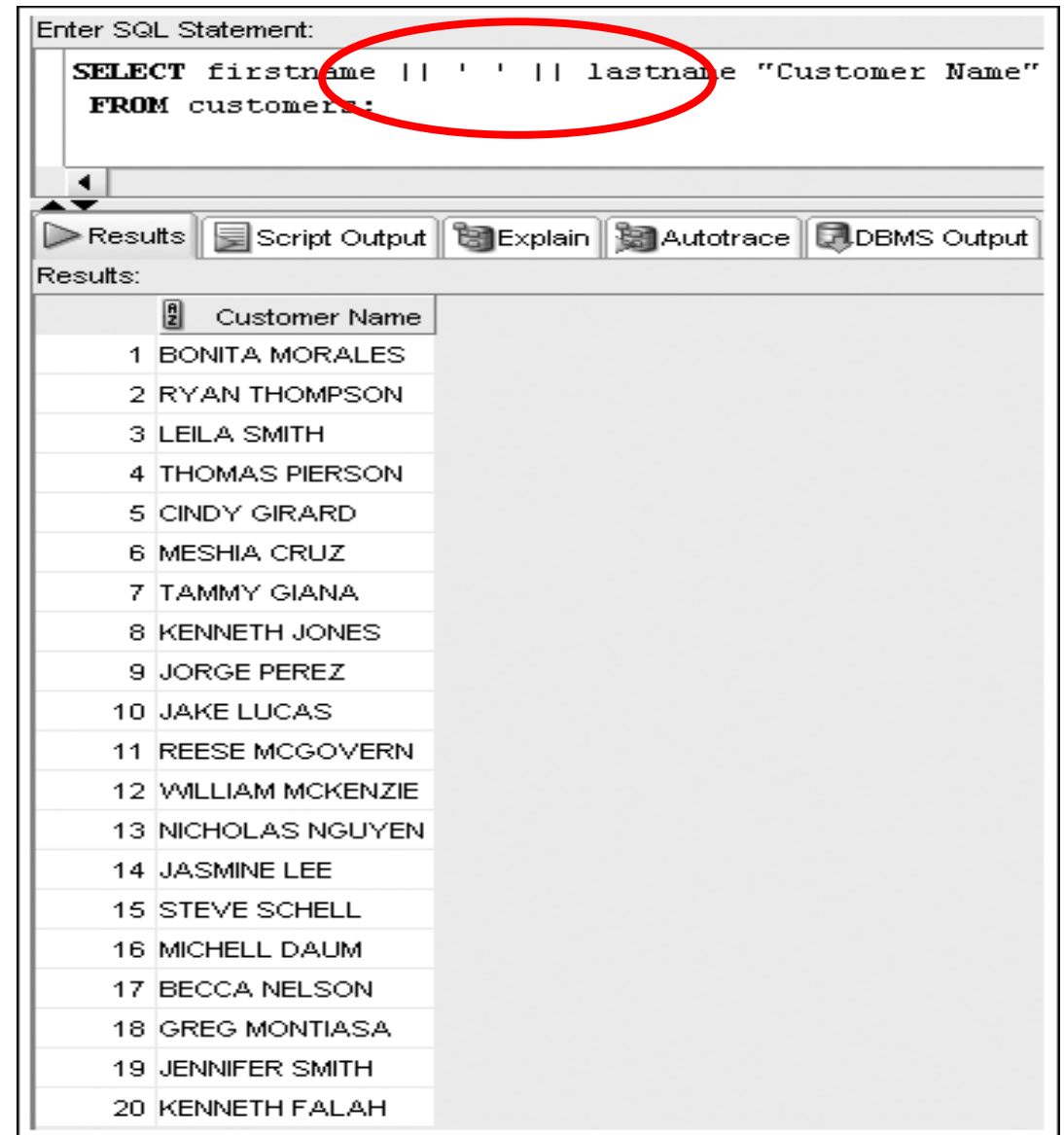
Results: Script Output Explain Autotrace DBMS Output

	STATE
1	NJ
2	CA
3	WY
4	MA
5	GA
6	IL
7	MI
8	NY
9	FL
10	ID
11	WA
12	TX

- In General When It Comes to a SELECT, UNIQUE is Older Syntax Used By Oracle...
- In a SELECT Statement, SELECT DISTINCT Removes All Duplicate Records When Returning Information...
- UNIQUE Is Still Used to Put a UNIQUE Constraints on Field That is NOT the Primary Key...
- For Example...a STUDENT Table May Have a PK of Student ID...But It Can Also Have a UNIQUE Constraints on SSN...

Concatenation in a SELECT...

- Used to Combine Data With a String Literal...
- Uses the Concatenation Operator, ||...
- Makes the Return Dataset More Readable...
- Make Sure You Concatenate Spaces Where Needed...
- Allows the Use of Column Aliases...



The screenshot shows a SQL query editor window. The query entered is: `SELECT firstname || ' ' || lastname "Customer Name" FROM customers;`. The concatenation operator `||` is highlighted with a red circle. Below the query, there are tabs for Results, Script Output, Explain, Autotrace, and DBMS Output. The Results tab is selected, showing a table with 20 rows of customer names.

	Customer Name
1	BONITA MORALES
2	RYAN THOMPSON
3	LEILA SMITH
4	THOMAS PIERSON
5	CINDY GIRARD
6	MESHIA CRUZ
7	TAMMY GIANA
8	KENNETH JONES
9	JORGE PEREZ
10	JAKE LUCAS
11	REESE MCGOVERN
12	WILLIAM MCKENZIE
13	NICHOLAS NGUYEN
14	JASMINE LEE
15	STEVE SCHELL
16	MICHELL DAUM
17	BECCA NELSON
18	GREG MONTIASA
19	JENNIFER SMITH
20	KENNETH FALAH

Questions...