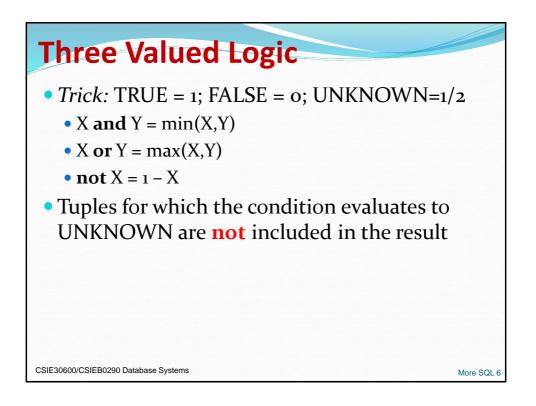
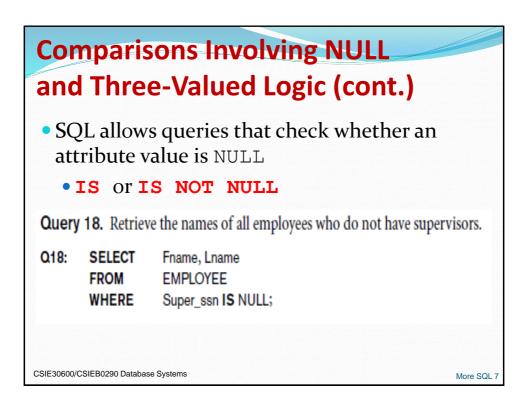
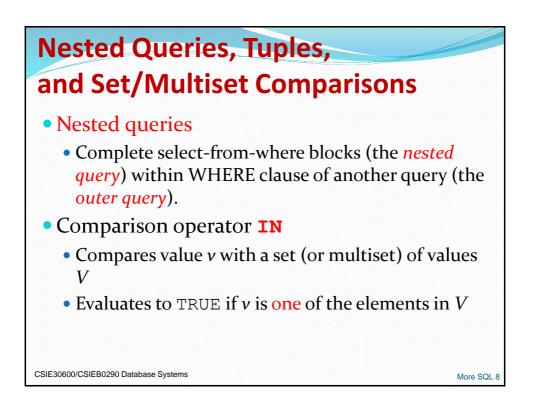
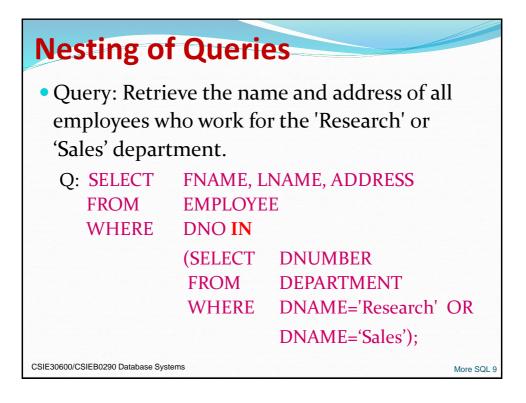


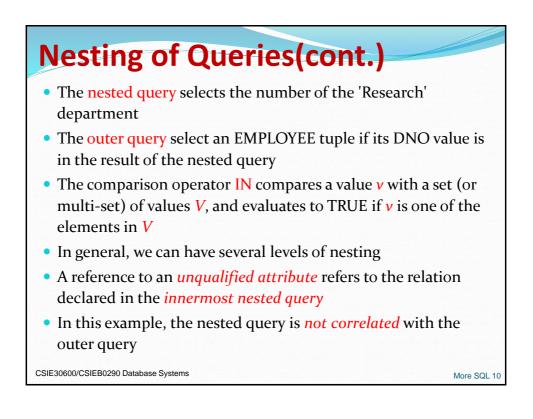
	•	/alued Lo	ng NULL ogic (con	
Table 7.1		ves in Three-Valued L		
(a)	AND	TRUE	FALSE	UNKNOWN
-	TRUE	TRUE	FALSE	UNKNOWN
	FALSE	FALSE	FALSE	FALSE
	UNKNOWN	UNKNOWN	FALSE	UNKNOWN
(b)	OR	TRUE	FALSE	UNKNOWN
_	TRUE	TRUE	TRUE	TRUE
	FALSE	TRUE	FALSE	UNKNOWN
	UNKNOWN	TRUE	UNKNOWN	UNKNOWN
(c)	NOT	1		
_	TRUE	FALSE		
	FALSE	TRUE		
	UNKNOWN	UNKNOWN		

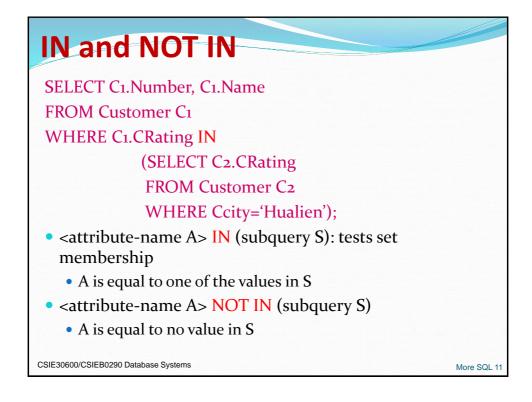




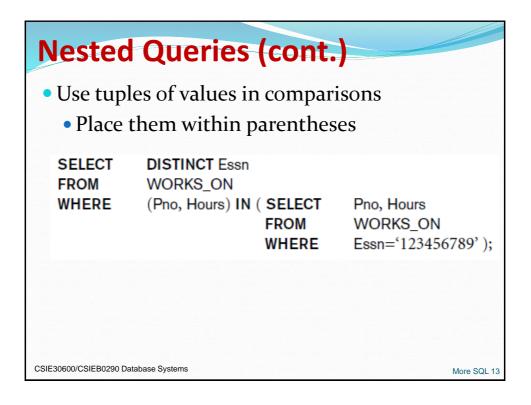


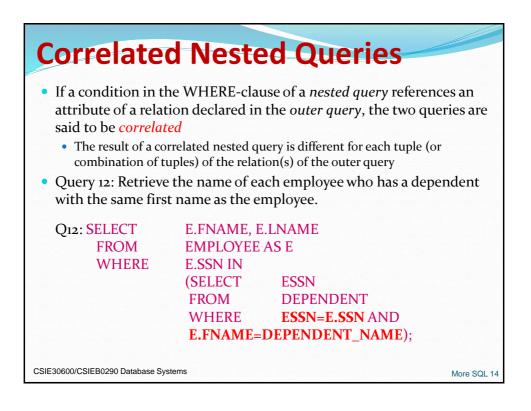


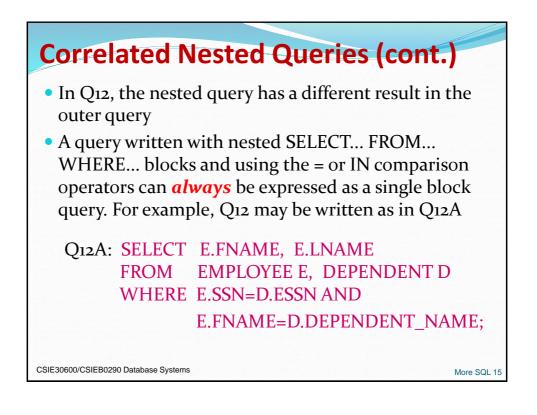


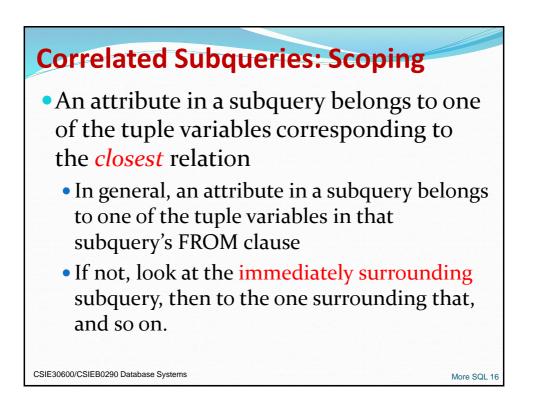


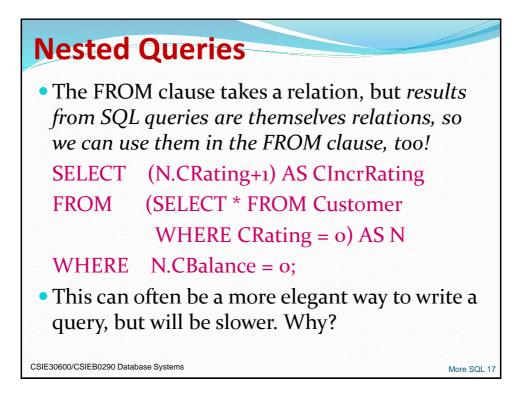
Q4A:	SELECT FROM WHERE	DISTINCT Pnu PROJECT Pnumber IN	mber
		( SELECT	Pnumber
		FROM WHERE	PROJECT, DEPARTMENT, EMPLOYEE Dnum=Dnumber AND
		WHERE	Mgr_ssn=Ssn AND Lname='Smith' )
		OR	<b>0</b> –
		Pnumber IN	
		( SELECT	Pho MORKO ON EMPLOYEE
		FROM WHERE	WORKS_ON, EMPLOYEE Essn=Ssn <b>AND</b> Lname='Smith' );

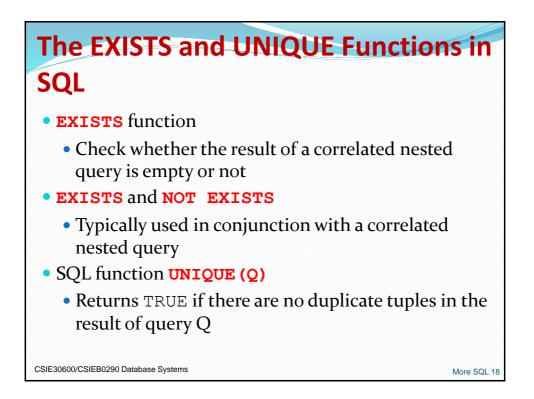


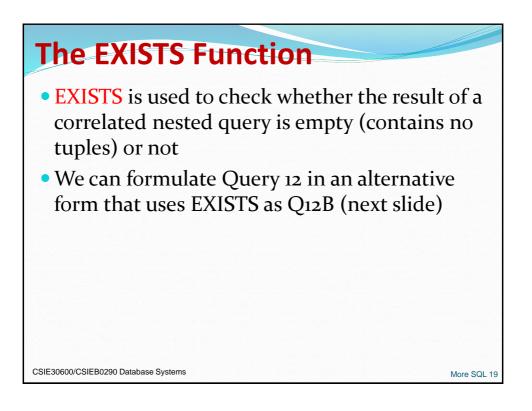


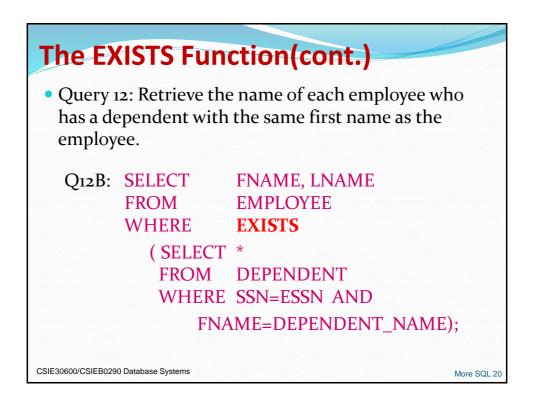


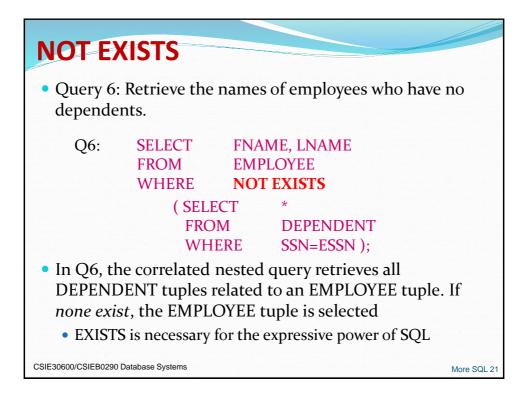


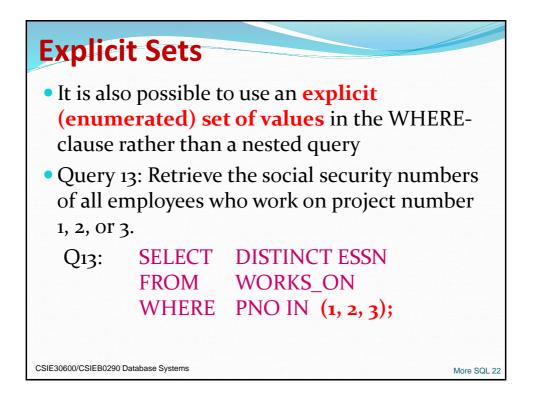


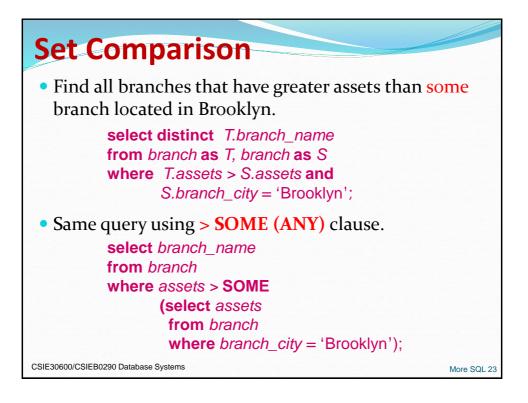


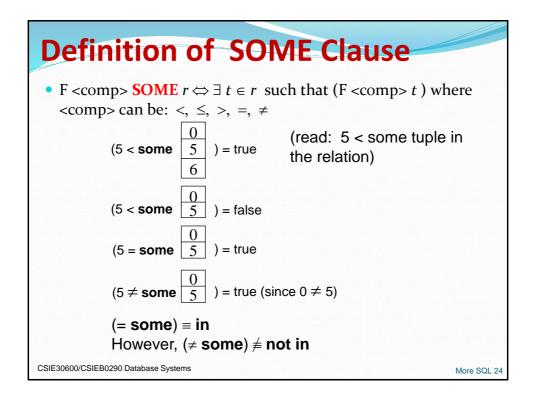


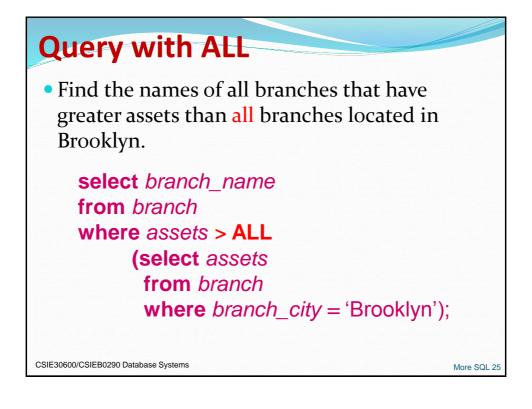


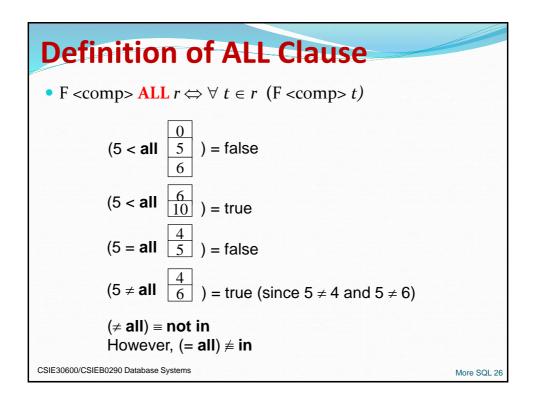


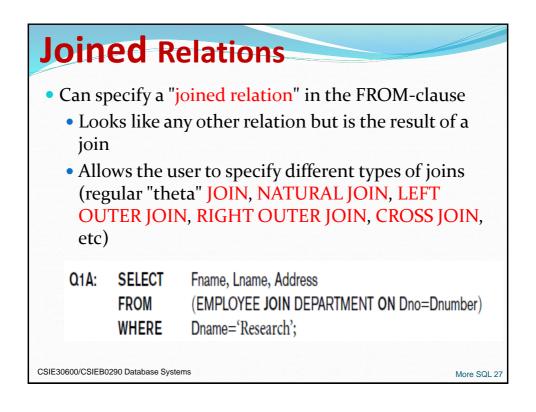


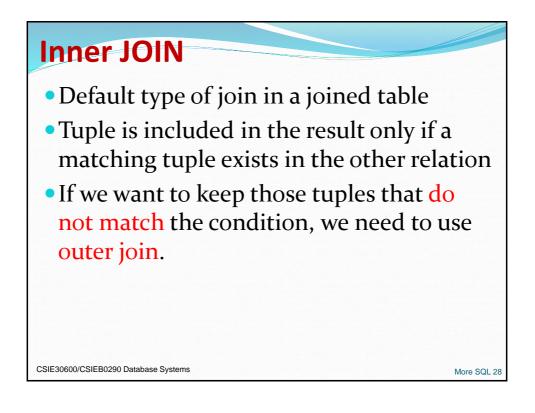


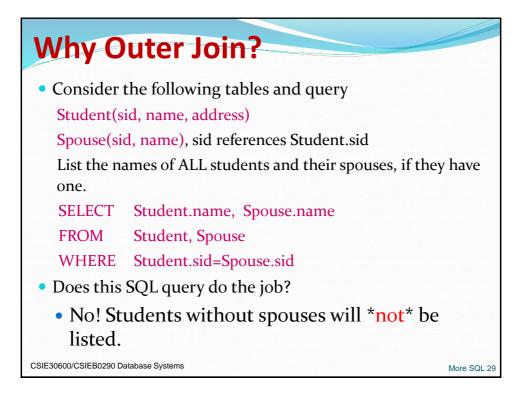


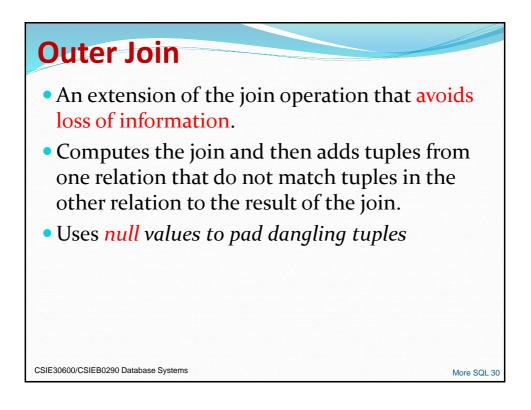


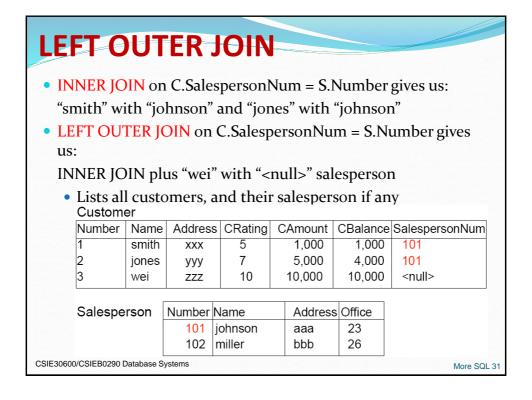


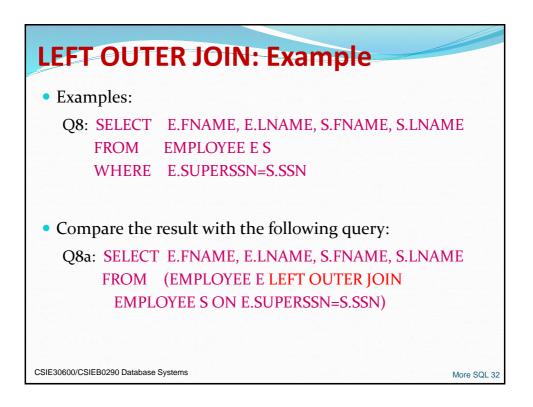




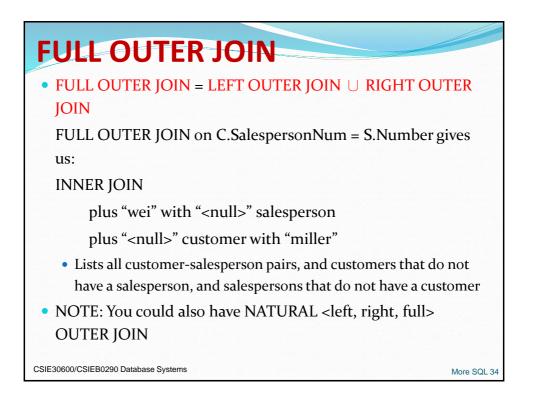


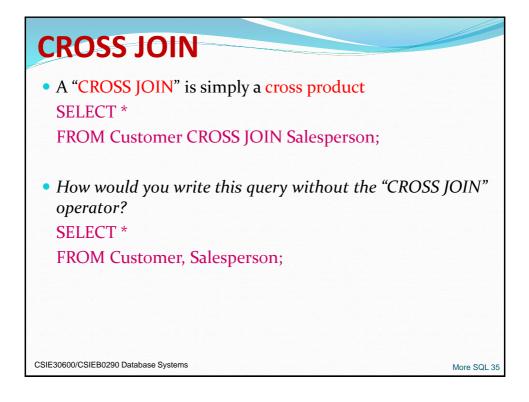




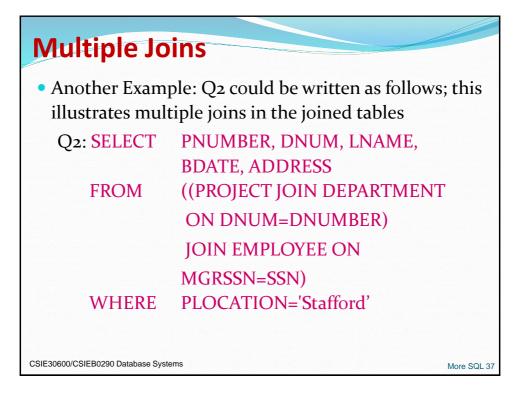


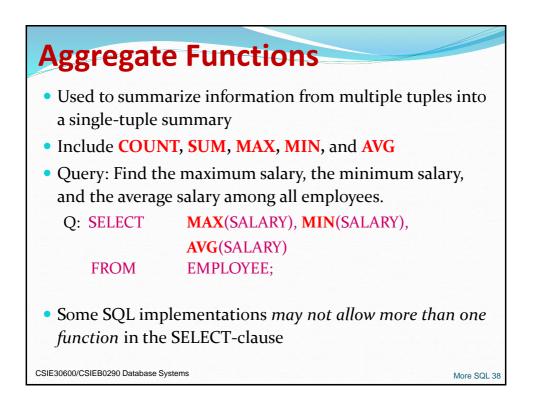
RIGH	RIGHT OUTER JOIN							
• INNER	JOIN	on C.Sa	lesperso	nNum =	S.Numb	er gives us:		
"smith"	"smith" with "johnson" and "jones" with "johnson"							
• <b>RIGHT OUTER JOIN</b> on C.SalespersonNum = S.Number gives:								
INNER	INNER JOIN plus " <null>" customer with "miller"</null>							
	<ul> <li>Lists customers that have a salesperson, and salespersons that do not have a customer</li> </ul>							
Custom	er							
Number	Name	Address	CRating	CAmount	CBalance	SalespersonNum		
1	smith	XXX	5	1,000	1,000	101		
2	jones	ууу	7	5,000	4,000	101		
3	wei	ZZZ	10	10,000	10,000	<null></null>		
Salespe	rson	Number	Name	Addres	s Office			
		101	johnson	aaa	23			
		102	miller	bbb	26			
CSIE30600/CSIEB02	90 Databas	se Systems				More SQL 33		



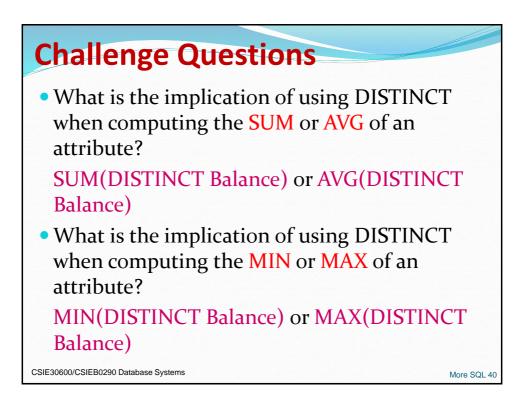


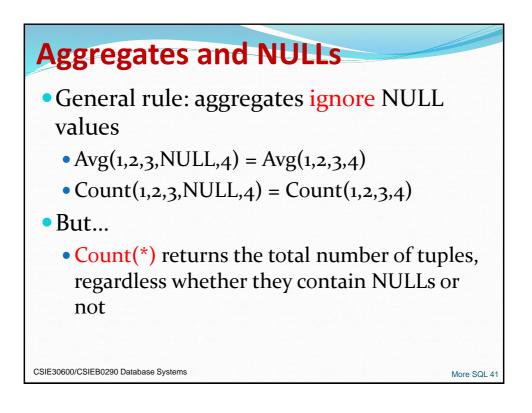
Mor	e Join	Examples
• Exan	nples:	
Qı:	SELECT FROM WHERE	FNAME, LNAME, ADDRESS EMPLOYEE, DEPARTMENT DNAME='Research' AND DNUMBER=DNO
• could	d be written	as:
Qı:	SELECT FROM	FNAME, LNAME, ADDRESS (EMPLOYEE <b>JOIN</b> DEPARTMENT <b>ON</b> DNUMBER=DNO)
	WHERE	DNAME='Research'
• or as	:	
Qı:	SELECT FROM	FNAME, LNAME, ADDRESS (EMPLOYEE <mark>NATURAL JOIN</mark> DEPARTMENT AS DEPT(DNAME, DNO, MSSN, MSDATE)
	WHERE	DNAME='Research'
CSIE30600/CS	IEB0290 Database Sys	stems More SQL 36

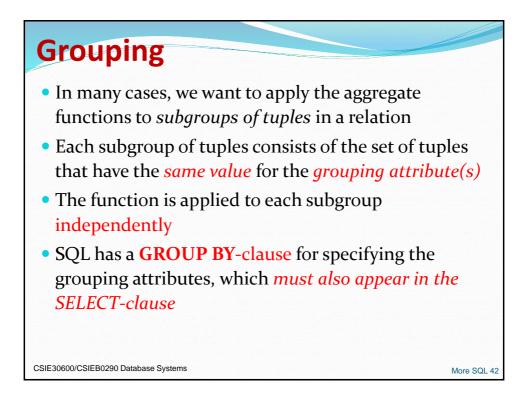


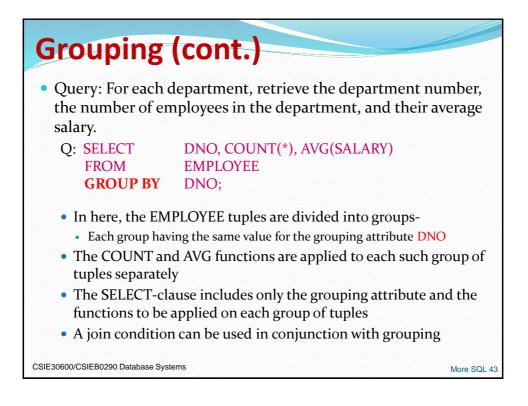


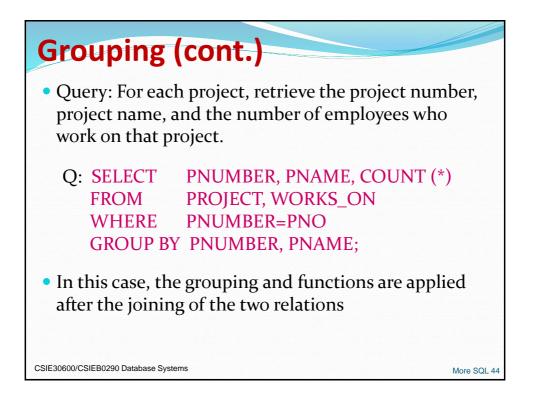
Ag	Aggregate Functions(contd.)					
depart	<b>Query 20.</b> Find the sum of the salaries of all employees of the 'Research' department, as well as the maximum salary, the minimum salary, and the average salary in this department.					
Q20:	SELECT FROM WHERE	SUM (Salary), MAX (Salary), MIN (Salary), AVG (Salary) (EMPLOYEE JOIN DEPARTMENT ON Dno=Dnumber) Dname='Research';				
1000	<b>Queries 21 and 22.</b> Retrieve the total number of employees in the company (Q21) and the number of employees in the 'Research' department (Q22).					
Q21:	SELECT FROM	COUNT (*) EMPLOYEE;				
Q22:	SELECT FROM WHERE	COUNT (*) EMPLOYEE, DEPARTMENT DNO=DNUMBER AND DNAME='Research';				
CSIE30600/	CSIEB0290 Databas	se Systems More SQL 39				

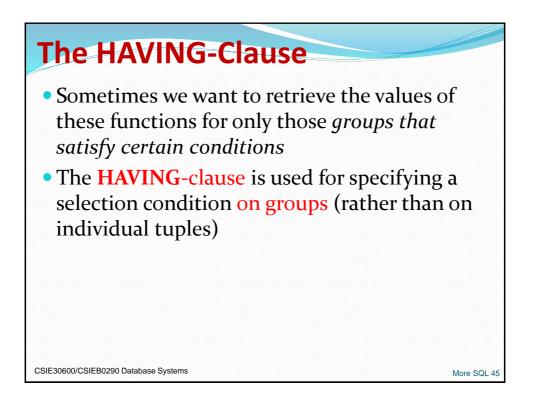


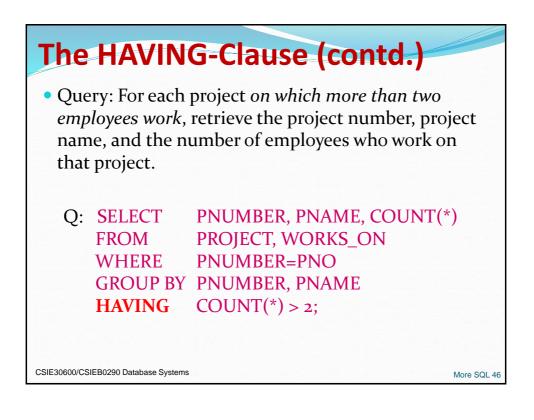












<b>Query</b> the de	<b>28</b> . For ea	ch department umber and the	ause (contd.) that has more than five employees, retrieve number of its employees who are making
Q28:	SELECT FROM WHERE	Dnumber, COU DEPARTMEN Dnumber=Dno ( SELECT FROM GROUP BY I	T, EMPLOYEE AND Salary>40000 AND Dnumber IN Dno EMPLOYEE
		HAVING	<b>COUNT</b> (*) > 5)
SIE30600/C	SIEB0290 Databas	e Systems	More SQL 4

<ul> <li>Aggregates ignore NULLs</li> <li>On the other hand, NULL is treated as an ordinary value in a grouped attribute</li> <li>If there are NULLs in the Salesperson column (below), a group will be returned for the NULL value (next slide)</li> </ul>							
,		)					
(nex <u>Custor</u> Number		Address	CRating	CAmount	CBalance	SalespersonNum	
Custom	ner		CRating 5	CAmount 1,000	CBalance 1,000	SalespersonNum 101	
Custom	ner Name	Address					

GROU	P BY and NI	JLLS (2)	
SELECT	SalespersonNum,	Count(*) AS	Г
FROM	Customer		
<b>GROUP</b> B	Y SalespersonNum;		
	Answer		
	Salesperson	Num T	
	NULL	1	
	101	2	
			1
CSIE30600/CSIEB0290	Database Systems		More SQL 49

