IBM Information Management software

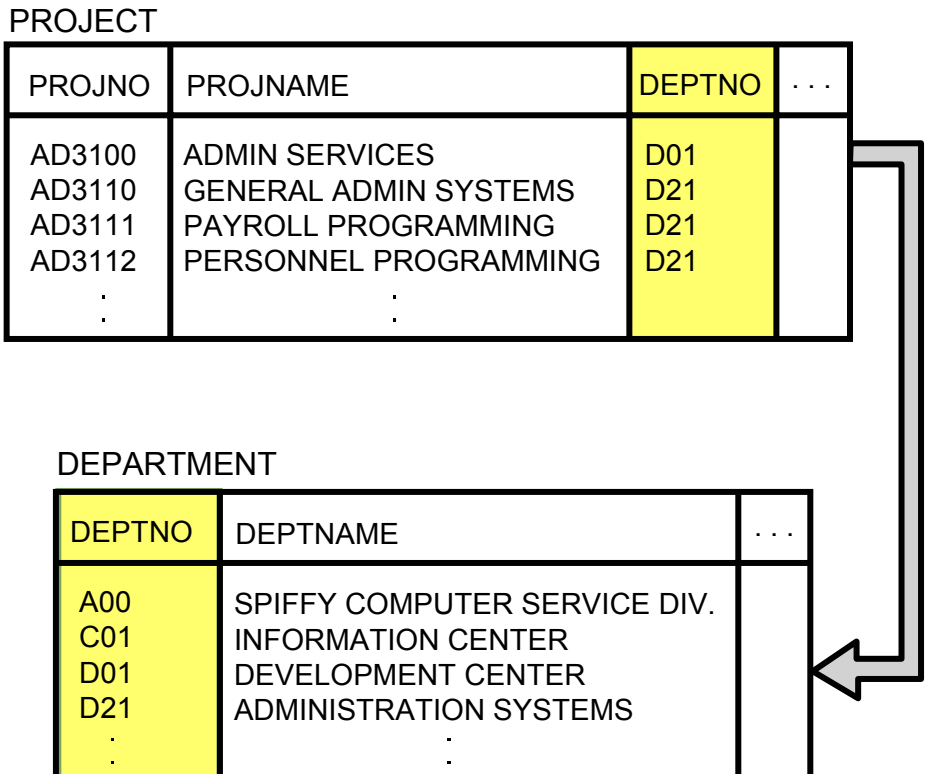
Retrieving Data from Multiple Tables

Unit Objectives

After completing this unit, you should be able to:

- Retrieve data from more than one table or view
- Specify JOIN predicates
- Use correlation names in queries

Retrieving Data from Multiple Tables (Principle)



Retrieving Data from Multiple Tables (JOIN)

For every project, list the project number, project name, and the number and name of the department responsible for the project.

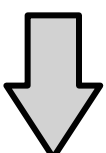
```
SELECT      PROJNO, PROJNAME, PROJECT.DEPTNO, DEPTNAME
FROM        PROJECT,  DEPARTMENT
WHERE       PROJECT.DEPTNO=DEPARTMENT.DEPTNO  -- JOIN PREDICATE
ORDER BY    PROJNO
```

PROJNO	PROJNAME	DEPTNO	DEPTNAME
AD3100	ADMIN SERVICES	D01	DEVELOPMENT CENTER
AD3110	GENERAL ADMIN SYSTEMS	D21	ADMINISTRATION SYSTEMS
AD3111	PAYROLL PROGRAMMING	D21	ADMINISTRATION SYSTEMS
AD3112	PERSONNEL PROGRAMMING	D21	ADMINISTRATION SYSTEMS
AD3113	ACCOUNT PROGRAMMING	D21	ADMINISTRATION SYSTEMS
...	...	...	...

Avoid a Cartesian Product!

Correlation Names

```
SELECT      P.PROJNO, P.PROJNAME, P.DEPTNO, D.DEPTNAME
FROM        PROJECT P,  DEPARTMENT D
WHERE       P.DEPTNO = D.DEPTNO
ORDER BY    P.PROJNO
```

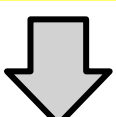


PROJNO	PROJNAME	DEPTNO	DEPTNAME
AD3100	ADMIN SERVICES	D01	DEVELOPMENT CENTER
AD3110	GENERAL ADMIN SYSTEMS	D21	ADMINISTRATION SYSTEMS
AD3111	PAYROLL PROGRAMMING	D21	ADMINISTRATION SYSTEMS
AD3112	PERSONNEL PROGRAMMING	D21	ADMINISTRATION SYSTEMS
AD3113	ACCOUNT PROGRAMMING	D21	ADMINISTRATION SYSTEMS
...	...	...	...

JOIN Syntax 1

For employees with a last name of HAAS, display the employee number, last name, and the number and name of the department they are working in.

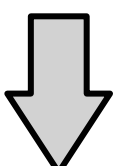
```
SELECT    EMPNO, LASTNAME, WORKDEPT, DEPTNAME
FROM      EMPLOYEE, DEPARTMENT
WHERE     WORKDEPT = DEPTNO
    AND   LASTNAME = 'HAAS'
```



EMPNO	LASTNAME	WORKDEPT	DEPTNAME
000010	HAAS	A00	SPIFFY COMPUTER SERVICE DIV.

JOIN Syntax 2 (JOIN Keyword)

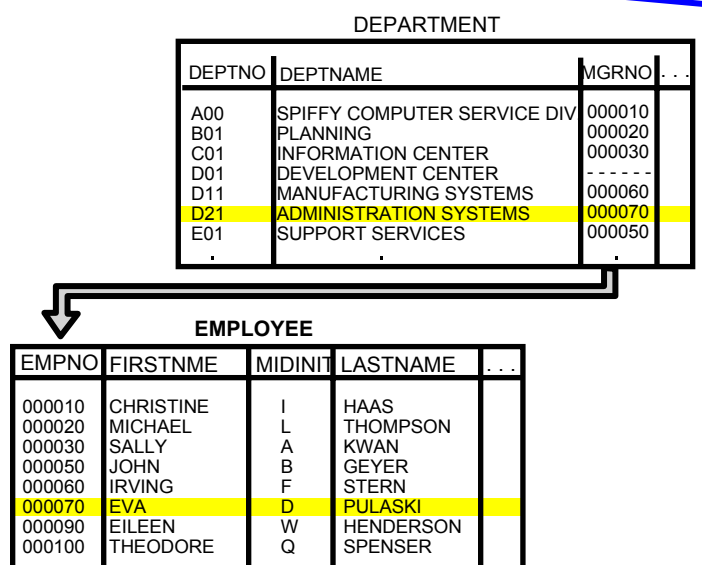
```
SELECT    EMPNO, LASTNAME, WORKDEPT, DEPTNAME
FROM      EMPLOYEE JOIN
          DEPARTMENT
ON        WORKDEPT = DEPTNO
WHERE     LASTNAME = 'HAAS'
```



EMPNO	LASTNAME	WORKDEPT	DEPTNAME
000010	HAAS	A00	SPIFFY COMPUTER SERVICE DIV.

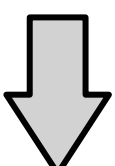
Another JOIN Example (1 of 2)

Display the department name, and the employee number and last name of the manager, for department D21.



Another JOIN Example (2 of 2)

```
SELECT    DEPTNAME, MGRNO, LASTNAME
FROM      DEPARTMENT, EMPLOYEE
WHERE     MGRNO = EMPNO
  AND     DEPTNO = 'D21'
```



DEPTNAME	MGRNO	LASTNAME
ADMINISTRATION SYSTEMS	000070	PULASKI

JOIN with Three Tables (1 of 2)

PROJECT

PROJNO	PROJNAME	DEPTNO	. . .
AD3100	ADMIN SERVICES	D01	
AD3110	GENERAL AD SYSTEMS	D21	
AD3111	PAYROLL PROGRAMMING	D21	
AD3112	PERSONNEL PROGRAMMING	D21	
AD3113	ACCOUNT. PROGRAMMING	D21	
IF1000	QUERY SERVICES	C01	
.	.	.	

For department D21 list PROJNO, DEPTNO, DEPTNAME, MGRNO, and LASTNAME.

DEPARTMENT

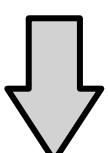
DEPTNO	DEPTNAME	MGRNO	. . .
A00	SPIFFY COMPUTER SERVICE DIV	000010	
B01	PLANNING	000020	
C01	INFORMATION CENTER	000030	
D01	DEVELOPMENT CENTER	- - - - - -	
D11	MANUFACTURING SYSTEMS	000060	
D21	ADMINISTRATION SYSTEMS	000070	
E01	SUPPORT SERVICES	000050	
.	.	.	

EMPLOYEE

EMPNO	FIRSTNME	MIDINIT	LASTNAME	. . .
000010	CHRISTINE	I	HAAS	
000020	MICHAEL	L	THOMPSON	
000030	SALLY	A	KWAN	
000050	JOHN	B	GEYER	
000060	IRVING	F	STERN	
000070	EVA	D	PULASKI	
000090	EILEEN	W	HENDERSON	
000100	THEODORE	Q	SPENSER	
.	.	.	.	

JOIN with Three Tables (2 of 2)

```
SELECT    PROJNO, P.DEPTNO, DEPTNAME, MGRNO, LASTNAME
FROM      PROJECT P,
          DEPARTMENT D,
          EMPLOYEE E
WHERE     P.DEPTNO  = D.DEPTNO      -- join predicate
  AND     D.MGRNO   = E.EMPNO       -- join predicate
  AND     D.DEPTNO  = 'D21'         -- local predicate
ORDER BY  PROJNO
```



PROJNO	DEPTNO	DEPTNAME	MGRNO	LASTNAME
AD3110	D21	ADMINISTRATION SYSTEMS	000070	PULASKI
AD3111	D21	ADMINISTRATION SYSTEMS	000070	PULASKI
AD3112	D21	ADMINISTRATION SYSTEMS	000070	PULASKI
AD3113	D21	ADMINISTRATION SYSTEMS	000070	PULASKI

Joining a Table with Itself (1 of 3)

DEPARTMENT

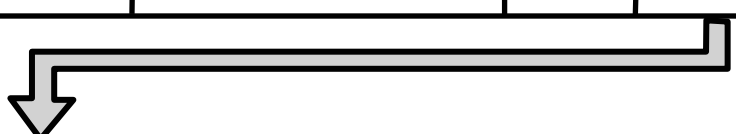
DEPTNO	DEPTNAME	MGRNO	ADMRDEPT
A00	SPIFFY COMPUTER SERVICE DIV.	000010	A00
B01	PLANNING	000020	A00
…	…	…	…

Joining a Table with Itself (2 of 3)

Display the name of department B01 and the name of the department it reports to

DEPARTMENT (DEP)

DEPTNO	DEPTNAME	MGRNO	ADMRDEPT
A00	SPIFFY COMPUTING SERVICE DIV.	000010	A00
B01	PLANNING	000020	A00

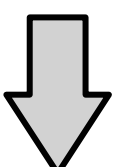


DEPTNO	DEPTNAME	MGRNO	ADMRDEPT
A00	SPIFFY COMPUTING SERVICE DIV.	000010	A00
B01	PLANNING	000020	A00

DEPARTMENT (SUP)

Joining a Table with Itself (3 of 3)

```
SELECT    DEP.DEPTNAME, SUP. DEPTNAME
FROM      DEPARTMENT DEP, DEPARTMENT SUP
WHERE     DEP.ADMRDEPT = SUP.DEPTNO
  AND     DEP.DEPTNO = 'B01'
```



DEPTNAME	DEPTNAME
PLANNING	SPIFFY COMPUTER SERVICE DIV.

Joining a Table with Itself – Another Example (1 of 2)

Which employees are older than their manager?

1. Retrieve employee's row from EMPLOYEE (E)

EMPNO	. . .	LASTNAME	WORKDEPT	. . .	BIRTHDATE	. . .
000100		SPENSER	E21		1956-12-18	
000330		LEE	E21		1941-07-18	

2. Obtain department number from DEPARTMENT (D)

DEPTNO	DEPTNAME	MGRNO	ADMRDEPT
E21	SOFTWARE SUPPORT	000100	E21

3. Retrieve row for manager from EMPLOYEE (M)

EMPNO	. . .	LASTNAME	WORKDEPT	. . .	BIRTHDATE	. . .
000100		SPENSER	E21		1956-12-18	
000330		LEE	E21		1941-07-18	

Joining a Table with Itself – Another Example (2 of 2)


```
SELECT    E.EMPNO, E.LASTNAME,
          E.BIRTHDATE, M.BIRTHDATE, M.EMPNO
FROM      EMPLOYEE E,
          DEPARTMENT D,
          EMPLOYEE M
WHERE     E.WORKDEPT = D.DEPTNO
  AND     D.MGRNO    = M.EMPNO
  AND     E.BIRTHDATE < M.BIRTHDATE
```

EMPNO	LASTNAME	BIRTHDATE	BIRTHDATE	EMPNO
000110	LUCCHESI	1929-11-05	1933-08-14	000010
000130	QUINTANA	1925-09-15	1941-05-11	000030
000200	BROWN	1941-05-29	1945-07-07	000060
000230	JEFFERSON	1935-05-30	1953-05-26	000070
000250	SMITH	1939-11-12	1953-05-26	000070
000260	JOHNSON	1936-10-05	1953-05-26	000070
000280	SCHNEIDER	1936-03-28	1941-05-15	000090
000300	SMITH	1936-10-27	1941-05-15	000090
000310	SETRIGHT	1931-04-21	1941-05-15	000090
000320	MEHTA	1932-08-11	1956-12-18	000100
000330	LEE	1941-07-18	1956-12-18	000100
000340	GOUNOT	1926-05-17	1956-12-18	000100

Checkpoint

1. True or False? If you reference multiple tables in the FROM clause, you should use JOIN conditions to obtain the desired result.
2. Which of the following situations applies if you forget the JOIN conditions in a SELECT statement using multiple tables:
   a. You receive an error and the statement is not executed.
   b. The statement is executed and the result is the Cartesian product of the tables.
3. Why do we use correlation names in a SELECT?

Checkpoint Solutions

1. True
2. b
3. As short names for (qualified) tables
   To avoid ambiguity
   To establish correlated references

Unit Summary

Having completed this unit, you should be able to:

- Retrieve data from more than one table or view
- Specify JOIN predicates
- Use correlation names in queries