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P U E R T O R I C O

Computer Science

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Database Systems

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Part I. Review Question and Exercises from the book Database Systems: Design, Implementation, & Management by Carlos Coronel and Steven Morris (Use Edition 12 that is not so expensive) (50 points).

Chapter 5.

Review Questions: 1-6: Page 189

1. What is an entity supertype, and why is it used?

An entity supertype is a generic entity type that contains common characteristics shared by one or more subtypes. It avoids redundancy by allowing common attributes and relationships to be defined in the supertype. At the same time, unique characteristics of subtypes are captured in the subtypes. This approach allows for efficient organization and representation of data in a database.

2. What kinds of data would you store in an entity subtype?

Entity subtypes store data that is unique to each subtype. For example, in the case of employees, while common attributes like name and hire date are stored in the supertype, a subtype such as a pilot would store specific attributes like flight hours or certifications.

3. What is a specialization hierarchy?

A specialization hierarchy is a top-down organizational structure that arranges a higher-level entity supertype and its related subtypes. It depicts the relationships between supertypes and subtypes, often represented by "is-a" relationships, where each subtype inherits common attributes and relationships from its supertype.

4. What is a subtype discriminator? Give an example of its use.

A subtype discriminator is an attribute in the supertype that determines to which subtype an instance belongs. For example, the EMP_TYPE attribute might be used in an employee database to differentiate between pilots, mechanics, and accountants based on the value stored in this attribute.

5. What is an overlapping subtype? Give an example.

An overlapping subtype is a situation where an entity instance can belong to more than one subtype. For example, in a university, a person can be both an employee and a student. Therefore, the PERSON supertype might have overlapping subtypes of STUDENT and EMPLOYEE.

6. What is the difference between partial completeness and total completeness?

Partial completeness indicates that some instances of the supertype may not belong to any subtype. In contrast, total completeness means that every instance of the supertype must be a member of at least one subtype.

Chapter 6.

Review Questions: 1-6: Pages 235

1. What is normalization?

Normalization is a process used in database design to organize data to reduce redundancies and improve data integrity. It involves breaking down large tables into smaller, well-structured tables by ensuring each table has a clear purpose and adheres to the rules of normal forms.

2. When is a table in 1NF?

A table is in first normal form (1NF) when all key attributes are defined, there are no repeating groups, and all attributes depend solely on the primary key.

3. When is a table in 2NF?

A table is in second normal form (2NF) when it is already in 1NF, and all non-key attributes are fully dependent on the entire primary key, with no partial dependencies.

4. When is a table in 3NF?

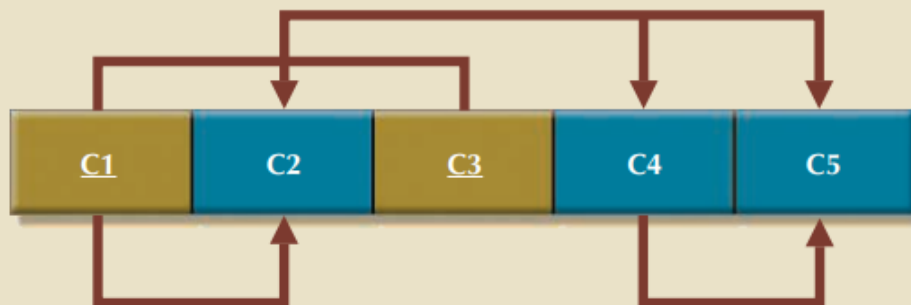
A table is in the third normal form (3NF) when it is in 2NF, and there are no transitive dependencies, meaning no non-key attribute depends on another non-key attribute.

5. When is a table in BCNF?

A table is in Boyce-Codd Normal Form (BCNF) if it is in 3NF and every determinant is a candidate key. BCNF handles anomalies that might exist in 3NF when a non-key attribute serves as a determinant.

6. Given the dependency diagram shown in Figure Q6.6, answer Items 6a–6c.

FIGURE Q6.6 DEPENDENCY DIAGRAM FOR QUESTION 6



a. Identify and discuss each of the indicated dependencies.

Each arrow in the diagram represents a functional dependency. For example, the dependency between C1 and C2 shows that the value of C1 determines the value of C2, indicating a direct functional relationship.

b. Create a database whose tables are at least in 2NF, showing the dependency diagrams for each table.

#	C1	C2
1	1	A
2	2	B
3	3	C

#	C1	C3
1	1	X
2	2	Y
3	3	Z

#	C4	C5
1	P	100
2	Q	200
3	R	300

- c. Create a database whose tables are at least in 3NF, showing the dependency diagrams for each table.

#	C1	C2
1	1	A
2	2	B
3	3	C

#	C1	C2
1	1	X
2	2	Y
3	3	Z

#	C4	C5
1	P	100
2	Q	200
3	R	300

Chapter 7.

Review Questions: 1-12: Page 306-307

- 1. In a SELECT query, what is the difference between a WHERE clause and a HAVING clause?**

The WHERE clause filters records before any groupings are made by the GROUP BY clause, operating on individual rows. In contrast, the HAVING clause filters records after the GROUP BY operation, applying conditions to the grouped rows. This means WHERE cannot be used with aggregate functions, but HAVING can.

- 2. Explain why the following command would create an error and what changes could be made to fix the error:**

SELECT V_CODE, SUM(P_QOH) FROM PRODUCT;

The command produces an error because the V_CODE column is not part of an aggregate function or the GROUP BY clause. To fix it, you need to add a GROUP BY V_CODE clause, which will group rows by V_CODE before applying the aggregate function SUM(P_QOH).

- 3. What type of integrity is enforced when a primary key is declared?**

Declaring a primary key enforces entity integrity. This ensures that each row in a table is uniquely identifiable, and that no part of the primary key can contain null values.

- 4. Explain why it might be more appropriate to declare an attribute that contains only digits as a character data type instead of a numeric data type.**

It is more appropriate to use a character data type for digits that do not require arithmetic operations. For example, zip codes or phone numbers are better represented as characters to avoid misinterpretation of leading zeros or non-numerical operations.

5. What is the difference between a column constraint and a table constraint?

A column constraint is applied directly to a specific column, while a table constraint applies to the table as a whole. For instance, a UNIQUE constraint on a column ensures its values are unique, while a table-level constraint could enforce that a combination of columns is unique.

6. What are “referential constraint actions”?

Referential constraint actions enforce referential integrity between tables, ensuring that a foreign key either has a null value or matches a primary key in the referenced table.

Common actions include CASCADE, SET NULL, and RESTRICT.

7. Rewrite the following WHERE clause without the use of the IN special operator:

WHERE V_STATE IN ('TN', 'FL', 'GA')

WHERE (V_STATE = 'TN' OR V_STATE = 'FL' OR V_STATE = 'GA')

8. Explain the difference between an ORDER BY clause and a GROUP BY clause.

The ORDER BY clause arranges the result set in a specified order, either ascending or descending, based on one or more columns. The GROUP BY clause, on the other hand, groups rows that share a common value into summary rows, typically used with aggregate functions.

9. Explain why the following two commands produce different results:

SELECT DISTINCT COUNT (V_CODE) FROM PRODUCT;

SELECT COUNT (DISTINCT V_CODE) FROM PRODUCT;

The first query SELECT DISTINCT COUNT(V_CODE) applies the DISTINCT modifier to the result of COUNT, meaning it eliminates duplicate counts, whereas the second query SELECT COUNT(DISTINCT V_CODE) counts only distinct V_CODE values, producing a different result .

10. What is the difference between the COUNT aggregate function and the SUM aggregate function?

The COUNT function tallies the number of non-null values in a column, while SUM adds up all the values in a column. COUNT can work on any data type, but SUM is used only for numeric data.

11. Explain why it would be preferable to use a DATE data type to store date data instead of a character data type.

Using a DATE data type ensures that dates are stored in a standard format and allows for efficient use of date functions (e.g., adding or subtracting dates). Storing dates as strings would prevent these operations and may lead to inconsistencies.

12. What is a recursive join?

A recursive join occurs when a table is joined to itself. This is often used to represent hierarchical data, such as employee-manager relationships, where each row in the table refers to another row in the same table.

Chapter 8.

Review Questions: Odd numbers: Page 417-418

1. What is a CROSS JOIN? Give an example of its syntax.

A CROSS JOIN produces the Cartesian product of two tables. This means every row from the first table is paired with every row from the second table. The syntax is:

SELECT * FROM T1 CROSS JOIN T2;

3. Using tables named T1 and T2, write a query example for each of the three join types you described in Question 2. Assume that T1 and T2 share a common column named C1.

INNER JOIN:

SELECT T1.C1, T1.column2, T2.column3

FROM T1

INNER JOIN T2 ON T1.C1 = T2.C1;

LEFT JOIN:

SELECT T1.C1, T1.column2, T2.column3

FROM T1

LEFT JOIN T2 ON T1.C1 = T2.C1;

CROSS JOIN:

SELECT *

FROM T1

CROSS JOIN T2

5. What are the three types of results that a subquery can return?

After running the following UNION query:

A subquery can return (1) a single value (scalar subquery), (2) a list of values (multi-row subquery), or (3) a table of values (multi-column subquery).

7. Explain the difference between a regular subquery and a correlated subquery.

A regular subquery runs once independently, while a correlated subquery references values from the outer query and is executed for each row processed by the outer query.

9. The relational set operators UNION, INTERSECT, and EXCEPT (MINUS) work properly only when the relations are union-compatible. What does union-compatible mean, and how would you check for this condition?

Union-compatibility means two relations must have the same number of columns and the columns must have compatible data types. To check for union-compatibility, compare the schema of both relations to ensure they have the same structure.

11. Suppose you have two tables: EMPLOYEE and EMPLOYEE_1. The EMPLOYEE table contains the records for three employees: Alice Cordoza, John Cretchakov, and Anne McDonald. The EMPLOYEE_1 table contains the records for employees John Cretchakov and Mary Chen. Given that information, list the query output for the UNION query.

SELECT EMP_LNAME, EMP_FNAME FROM EMPLOYEE

UNION

SELECT EMP_LNAME, EMP_FNAME FROM EMPLOYEE_1;

The output would be:

Alice Cordoza

John Cretchakov

Anne McDonald

Mary Chen

13. Given the employee information in Question 11, list the query output for the INTERSECT query.

SELECT EMP_LNAME, EMP_FNAME FROM EMPLOYEE

INTERSECT

SELECT EMP_LNAME, EMP_FNAME FROM EMPLOYEE_1;

The output would be:

John Cretchakov

15. Why does the order of the operands (tables) matter in an EXCEPT (MINUS) query but not in a UNION query?

In an EXCEPT (or MINUS) query, the order matters because it subtracts the result set of the second query from the first. Therefore, reversing the order will yield different results.
In contrast, a UNION combines the results from both queries and eliminates duplicates, so the order does not affect the final result.

17. What Oracle function should you use to calculate the number of days between your birth date and the current date?

In Oracle, the SYSDATE function can be used to get the current date, and subtracting a date from SYSDATE returns the number of days between the two dates. For example:
SELECT SYSDATE - BIRTH_DATE AS days_between FROM EMPLOYEE;

19. What string function should you use to list the first three characters of a company's EMP_LNAME values? Give an example using a table named EMPLOYEE. Provide examples for Oracle and SQL Server.

Oracle:

SELECT SUBSTR(EMP_LNAME, 1, 3) FROM EMPLOYEE;

SQL Server:

SELECT SUBSTRING(EMP_LNAME, 1, 3) FROM EMPLOYEE;

EMP_LNAME	EMP_FNAME
Cretchakov	John
Cordoza	Alice
McDonald	Anne
Chen	Mary

Output (first three characters of EMP_LNAME):

Cre

Cor

McD

Che

21. What is a trigger, and what is its purpose? Give an example.

A trigger is a special kind of stored procedure in a database that automatically runs when a specified event occurs, such as an INSERT, UPDATE, or DELETE operation on a table. Its purpose is to enforce business rules, maintain data integrity, or audit changes. For example, a trigger can be set up to log any changes to an employee's salary in a separate audit table whenever an update is made to the salary column.

23. What is embedded SQL and how is it used?

Embedded SQL refers to SQL commands written directly inside a programming language such as C, Java, or Python. It is used to run SQL queries within a program, allowing the program to interact with the database. Embedded SQL is usually processed by pre-compilers or APIs to allow smooth communication between the application code and the database.

Part II: SQL (60 points)

A. Review Questions (Module Quiz) Chapter 5-8 of the book *A Guide to SQL (2015)*: Odd Review Questions. Copy the question in bold face above the answer. Do not use bold face for the answers.

Chapter 5:

Odd Numbers: pgs. 168-169

1. How do you join tables in SQL?

You can join tables in SQL by listing the columns to display in the SELECT clause, then listing all tables involved in the FROM clause. In the WHERE clause, you specify the condition that restricts the data to be retrieved, which is based on matching values in corresponding columns from the tables being joined.

3. List two operators that you can use with subqueries as an alternate way of performing joins.

Two operators you can use with subqueries are IN and EXISTS. These operators can retrieve data from multiple tables without performing an explicit join.

5. What is an alias? How do you specify an alias in SQL? Why would you use an alias?

An alias in SQL is an alternate name for a table or column. You specify an alias by following the table or column name with a space and the alias. Aliases simplify queries, particularly when working with complex queries or self-joins. For example, you might alias the CUSTOMER table as C to make the query more concise.

- 7. What command would you use to show all rows of two tables? How would you use it? What command would you use to show only common rows between two tables? How would you use it?**

To show all rows from two tables, you would use an OUTER JOIN. For example, a LEFT JOIN retrieves all rows from the first table and matching rows from the second. To show only common rows, you would use an INNER JOIN, which retrieves rows where there is a match between the two tables based on the join condition.

- 9. How do you use the ALL operator with a subquery?**

The ALL operator is used with a subquery to ensure that the condition is true for all values returned by the subquery. For example, SELECT * FROM CUSTOMER WHERE BALANCE > ALL (SELECT BALANCE FROM CUSTOMER WHERE REP_ID = '10') finds customers whose balance is greater than the balance of all customers represented by a particular sales rep.

- 11. Which rows are included in an inner join? What clause can you use to perform an inner join in SQL?**

An inner join includes only rows that have matching values in both tables based on the join condition. You can perform an inner join using the INNER JOIN clause. For example, SELECT * FROM CUSTOMER INNER JOIN INVOICES ON CUSTOMER.CUST_ID = INVOICES.CUST_ID retrieves matching rows from both tables where customer IDs are the same.

13. Which rows are included in a right outer join? What clause can you use to perform a right outer join in SQL?

A right outer join includes all rows from the table listed on the right side of the join, and only matching rows from the left table. The RIGHT JOIN clause is used to perform a right outer join. For example, SELECT * FROM CUSTOMER RIGHT JOIN INVOICES ON CUSTOMER.CUST_ID = INVOICES.CUST_ID retrieves all invoices, even if they don't have a matching customer.

Chapter 6:

Odd Numbers: pgs. 197-198

1. Which command creates a new table?

The CREATE TABLE command is used to define the structure of a new table. This command is followed by the table name and the definitions for the columns and their data types.

3. How do you add data from an existing table to another table?

You can add data from an existing table to another table by first creating the new table using CREATE TABLE and then inserting data using the INSERT INTO command with a SELECT statement to specify which data to move from the existing table.

5. Which command removes rows from a table?

The DELETE command is used to remove rows from a table. You specify which rows to delete by using a WHERE clause in conjunction with this command.

7. Which command reverses updates? Which updates are reversed?

The ROLLBACK command reverses updates that have not been committed. If no COMMIT has been made, ROLLBACK can undo all changes since the last commit.

- 9. What is the format of the SET clause that changes the value in a column to null in an UPDATE command?**

To change a value in a column to null, you use the UPDATE command with the SET clause in the format SET column_name = NULL. If you only want to set specific rows to null, you would include a WHERE clause to filter the rows.

- 11. Which command and clause changes the characteristics of an existing column in a table?**

You use the ALTER TABLE command along with the MODIFY clause to change the characteristics of an existing column in a table.

Chapter 7:

Odd Numbers: pgs. 234-235

1. What is a view?

A view is a virtual table that consists of data from one or more tables. It does not store the data physically but allows users to query it as if it were a real table.

3. What is a defining query?

A defining query is the SQL command used to create a view. It specifies the rows and columns from the underlying base tables that will appear in the view.

5. What are three advantages of using views?

The three advantages of using views are:

Data Independence: Views continue to work even if the underlying database structure changes.

Customization: Different users can view the same data in different ways based on their needs.

Security: Views can restrict access to sensitive data by limiting the columns or rows a user can see.

7. Which command deletes a view?

The DROP VIEW command is used to delete a view when it is no longer needed.

9. Which command terminates previously granted privileges?

The REVOKE command is used to terminate previously granted privileges. For example, you can revoke a user's SELECT permission with REVOKE SELECT ON table FROM user.

11. How do you create an index? How do you create a unique index? What is the difference between an index and a unique index?

You create an index using the CREATE INDEX command, while a unique index is created with CREATE UNIQUE INDEX. The difference is that a unique index enforces a rule that the indexed values must be unique within the column(s).

13. Does the DBMS or the user make the choice of which index to use to accomplish a given task?

The DBMS automatically chooses which index to use for a given query to improve performance.

15. The CUSTOMER table contains a foreign key, REP_ID, that must match the primary key of the SALES_REP table. What type of update(s) to the CUSTOMER table would violate the foreign key constraint?

Any update to the REP_ID in the CUSTOMER table that does not correspond to an existing REP_ID in the SALES_REP table would violate the foreign key constraint.

17. How is the system catalog updated?

The system catalog is updated automatically by the DBMS whenever changes are made to the database structure, such as creating or deleting tables, indexes, or views.

19. How do you specify a general integrity constraint?

A general integrity constraint is specified using the CHECK clause in a CREATE TABLE or ALTER TABLE statement, ensuring that only valid data is entered into the table.

21. How do you specify a foreign key in MySQL?

You specify a foreign key in MySQL using the FOREIGN KEY clause in the CREATE TABLE or ALTER TABLE statement, followed by the column that references the primary key of another table.

Chapter 8:

Odd Numbers: pg. 283-284

1. How do you display letters in uppercase in MySQL, Oracle, and SQL Server? How do you display letters in lowercase in MySQL, Oracle, and SQL Server?

To display letters in uppercase, use the UPPER() function in all three systems (MySQL, Oracle, and SQL Server). For lowercase letters, use the LOWER() function.

3. How do you add months to a date in MySQL, Oracle, and SQL Server? How do you add days to a date? How would you find the number of days between two dates?

In MySQL, use DATE_ADD(date, INTERVAL n MONTH) to add months; in Oracle, use ADD_MONTHS(date, n); and in SQL Server, use DATEADD(MONTH, n, date). To add days, simply use addition in all three systems. To find the number of days between two dates, use DATEDIFF().

5. How do you concatenate values in character columns in MySQL, Oracle, and SQL Server?

In MySQL and SQL Server, use the CONCAT() function, while in Oracle, you can use || for concatenation.

7. What are stored procedures? What purpose do they serve?

Stored procedures are precompiled SQL queries that are stored in the database and can be executed repeatedly. They help improve performance, ensure reusability, and centralize business logic in the database.

9. Where do you declare variables in MySQL and PL/SQL procedures?

In MySQL, declare variables using the DECLARE statement in the body of the procedure. In PL/SQL, variables are also declared in the body using the same syntax.

11. How do you place the results of a SELECT command into variables in MySQL and PL/SQL?

Use the INTO clause after the SELECT statement to assign query results to variables.

13. How do you use a SELECT command that retrieves more than one row in a procedure?

When you expect more than one row, you must define a cursor, and then use FETCH to retrieve rows one at a time.

15. Which command selects the next row in a cursor?

The FETCH command selects the next row from a cursor.

17. What are triggers? What purpose do they serve?

A trigger is a procedure that is automatically executed in response to certain events on a table, such as INSERT, UPDATE, or DELETE. It helps maintain the integrity and automation of the database.

B. Show the complete question, query used, and print the query results.

Chapter 5:

(A Guide to SQL) Use the Staywell student Accommodation database only.

Case Exercises: Odd number Case Exercises, pg. 170-171

Use SQL and the StayWell Student Accommodation database (see Figures 1-4 through 1-9 in Module 1) to complete the following exercises. If directed to do so by your instructor, use the information provided with the Module 3 Exercises to print your output or save it to a document.

OWNER

OWNER_NUM	LAST_NAME	FIRST_NAME	ADDRESS	CITY	STATE	ZIP_CODE
MO100	Moore	Elle-May	8006 W. Newport Ave.	Reno	NV	89508
PA101	Patel	Makesh	7337 Sheffield St.	Seattle	WA	98119
AK102	Aksoy	Ceyda	411 Griffin Rd.	Seattle	WA	98131
CO103	Cole	Meerab	9486 Circle Ave.	Olympia	WA	98506
KO104	Kowalczyk	Jakub	7431 S. Bishop St.	Bellingham	WA	98226
SI105	Sims	Haydon	527 Primrose Rd.	Portland	OR	97203
BU106	Burke	Ernest	613 Old Pleasant St.	Twin Falls	ID	83303
RE107	Redman	Seth	7681 Fordham St.	Seattle	WA	98119
LO108	Lopez	Janine	9856 Pumpkin Hill Ln.	Everett	WA	98213
BI109	Bianchi	Nicole	7990 Willow Dr.	New York	NY	10005
JO110	Jones	Ammarah	730 Military Ave.	Seattle	WA	98126

FIGURE 1-5 Sample data for the owners of StayWell properties

PROPERTY

PROPERTY_ID	OFFICE_NUM	ADDRESS	SQR_FT	BDRMS	FLOORS	MONTHLY_RENT	OWNER_NUM
1	1	30 West Thomas Rd.	1,600	3	1	1,400	BU106
2	1	782 Queen Ln.	2,100	4	2	1,900	AK102
3	1	9800 Sunbeam Ave.	1,005	2	1	1,200	BI109
4	1	105 North Illinois Rd.	1,750	3	1	1,650	KO104
5	1	887 Vine Rd.	1,125	2	1	1,160	SI105
6	1	8 Laurel Dr.	2,125	4	2	2,050	MO100
7	2	447 Goldfield St.	1,675	3	2	1,700	CO103
8	2	594 Leatherwood Dr.	2,700	5	2	2,750	KO104
9	2	504 Windsor Ave.	700	2	1	1,050	PA101
10	2	891 Alton Dr.	1,300	3	1	1,600	LO108
11	2	9531 Sherwood Rd.	1,075	2	1	1,100	JO110
12	2	2 Bow Ridge Ave.	1,400	3	2	1,700	RE107

FIGURE 1-6 Sample data for StayWell properties

OFFICE

OFFICE_NUM	OFFICE_NAME	ADDRESS	AREA	CITY	STATE	ZIP_CODE
1	StayWell-Columbia City	1135 N. Wells Avenue	Columbia City	Seattle	WA	98118
2	StayWell-Georgetown	986 S. Madison Rd	Georgetown	Seattle	WA	98108

FIGURE 1-4 Sample data for StayWell offices

SERVICE_CATEGORY

CATEGORY_NUM	CATEGORY_DESCRIPTION
1	Plumbing
2	Heating
3	Painting
4	Electrical systems
5	Carpentry
6	Furniture replacement

FIGURE 1-7 Sample category data for StayWell maintenance services

SERVICE_REQUEST

SERVICE_ID	PROPERTY_ID	CATEGORY_NUMBER	OFFICE_NUM	DESCRIPTION	STATUS	EST_HOURS	SPENT_HOURS	NEXT_SERVICE_DATE
1	11	2	2	The second bedroom upstairs is not heating up at night.	Problem has been confirmed. Central heating engineer has been scheduled.	2	1	11/01/2019
2	1	4	1	A new strip light is needed for the kitchen.	Scheduled	1	0	10/02/2019
3	6	5	1	The bathroom door does not close properly.	Service rep has confirmed issue. Scheduled to be refitted.	3	1	11/09/2019
4	2	4	1	New outlet has been requested for the first upstairs bedroom. (There is currently no outlet).	Scheduled	1	0	10/02/2019
5	8	3	2	New paint job requested for the common area (lounge).	Open	10	0	
6	4	1	1	Shower is dripping when not in use.	Problem confirmed. Plumber has been scheduled.	4	2	10/07/2019
7	2	2	1	Heating unit in the entrance smells like it's burning.	Service rep confirmed the issue to be dust in the heating unit. To be cleaned.	1	0	10/09/2019
8	9	1	2	Kitchen sink does not drain properly.	Problem confirmed. Plumber scheduled.	6	2	11/12/2019
9	12	6	2	New sofa requested.	Open	2	0	

FIGURE 1-8 Sample service request category

RESIDENTS

RESIDENT_ID	FIRST_NAME	SURNAME	PROPERTY_ID
1	Albie	O’Ryan	1
2	Tariq	Khan	1
3	Ismail	Salib	1
4	Callen	Beck	2
5	Milosz	Polansky	2
6	Ashanti	Lucas	2
7	Randy	Woodrue	2
8	Aislinn	Lawrence	3
9	Monique	French	3
10	Amara	Dejsuwan	4
12	Rosalie	Blackmore	4
13	Carina	Britton	4
14	Valentino	Ortega	5
15	Kaylem	Kent	5
16	Alessia	Wagner	6
17	Tyrone	Galvan	6
18	Constance	Fleming	6
19	Eamonn	Bain	6
20	Misbah	Yacob	7
21	Gianluca	Esposito	7
22	Elinor	Lake	7
23	Ray	Rosas	8
24	Damon	Caldwell	8
25	Dawood	Busby	8
26	Dora	Harris	8
27	Leroy	Stokes	8
28	Tamia	Hess	9
29	Amelia	Sanders	9
30	Zarah	Byers	10
31	Sara	Farrow	10
32	Delilah	Roy	10
33	Dougie	McDaniel	11
34	Tahir	Halabi	11
35	Mila	Zhikin	12
36	Glenn	Donovan	12
37	Zayn	Fowler	12

FIGURE 1-9 Sample data for StayWell residents

1. For every property, list the management office number, address, monthly rent, owner number, owner's first name, and owner's last name.

The screenshot shows the Oracle Application Express interface. The SQL command window contains the following query:

```
SELECT p.OFFICE_NUM, p.ADDRESS, p.MONTHLY_RENT, o.OWNER_NUM, o.FIRST_NAME, o.LAST_NAME
FROM PROPERTY p
JOIN OWNER o ON p.OWNER_NUM = o.OWNER_NUM;
```

The results window displays a table with 10 rows and 6 columns:

OFFICE_NUM	ADDRESS	MONTHLY_RENT	OWNER_NUM	FIRST_NAME	LAST_NAME
1	782 Queen Ln.	1900	AK0102	Cryda	Aksay
1	9080 Sunnaha Ave.	1200	BH0109	Nicole	Blanche
2	474 Goldfield St.	1700	CO0103	Meredith	Cole
2	8531 Sherwood Rd.	1100	JO0110	Amannah	Jones
2	504 Leatherwood Dr.	2750	K0104	Jakob	Kowalczyk
1	951 Sherwood Rd.	1600	LO0108	Janine	Lopez
1	30 West Thomas Rd.	1400	MO100	Elle-May	Moore
1	8 Laurel Dr.	2660	MO100	Elle-May	Moore
2	504 Windsor Ave.	1050	PA0101	Mekalah	Patel
1	1058 North Indian Blvd.	1500	RE0107	Seth	Redman

More than 10 rows available. Increase rows selector to view more rows.
10 rows returned in 0.03 seconds

3. For every service request for furniture replacement, list the property ID, management office number, address, estimated hours, spent hours, owner number, and owner's last name.

The screenshot shows the Oracle Application Express interface. The SQL command window contains the following query:

```
SELECT sr.PROPERTY_ID, sr.OFFICE_NUM, p.ADDRESS, sr.EST_HOURS, sr.SPENT_HOURS, o.OWNER_NUM, o.LAST_NAME
FROM SERVICE_REQUEST sr
JOIN PROPERTY p ON sr.PROPERTY_ID = p.PROPERTY_ID
JOIN OWNER o ON p.OWNER_NUM = o.OWNER_NUM
WHERE sr.CATEGORY_NUMBER = 5;
```

The results window displays a table with 1 row and 7 columns:

PROPERTY_ID	OFFICE_NUM	ADDRESS	EST_HOURS	SPENT_HOURS	OWNER_NUM	LAST_NAME
6	1	8 Laurel Dr.	3	1	MO100	Moore

1 rows returned in 0.01 seconds

5. Repeat Exercise 4, (List the first and last names of all owners who own a two-bedroom property. Use the IN operator in your query.) but this time use the EXISTS operator in your query.

The screenshot shows the Oracle Application Express interface. The SQL Commands window contains the following query:

```
SELECT o.FIRST_NAME, o.LAST_NAME
FROM OWNER o
WHERE EXISTS (
  SELECT 1
  FROM PROPERTY p
  WHERE p.OWNER_NUM = o.OWNER_NUM AND p.BDRMS = 2
);
```

The Results window displays the following data:

FIRST_NAME	LAST_NAME
Nicole	Bianche
Amannah	Jones
Seth	Redman
Haydon	Sinas

4 rows returned in 0.01 seconds

7. List the square footage, owner number, owner last name, and owner first name for each property managed by the Columbia City office.

The screenshot shows the Oracle Application Express interface. The SQL Commands window contains the following query:

```
SELECT p.SQR_FT, o.OWNER_NUM, o.LAST_NAME, o.FIRST_NAME
FROM PROPERTY p
JOIN OWNER o ON p.OWNER_NUM = o.OWNER_NUM
WHERE p.OFFICE_NUM = 1;
```

The Results window displays the following data:

SQR_FT	OWNER_NUM	LAST_NAME	FIRST_NAME
2100	AK0102	Aksay	Ceyda
1100	BH0109	Bianche	Nicole
1300	LO0108	Lopez	Janine
1600	MO0100	Moore	Elle-May
2125	MO0100	Moore	Elle-May
1705	RE0107	Redman	Seth
1125	SI0105	Sinas	Haydon

7 rows returned in 0.01 seconds

9. List the office number, address, and monthly rent for properties whose owners live in Washington state or own two-bedroom properties.

The screenshot shows the Oracle Application Express interface. The SQL command window contains the following query:

```
SELECT p.OFFICE_NUM, p.ADDRESS, p.MONTHLY_RENT
FROM PROPERTY p
JOIN OWNER o ON p.OWNER_NUM = o.OWNER_NUM
WHERE o.STATE = 'WA' OR p.BDRMS = 2;
```

The Results tab displays the following data:

OFFICE_NUM	ADDRESS	MONTHLY_RENT
1	782 Queen Ln.	1900
1	9080 Sunnaha Ave.	1200
2	474 Goldfield St.	1700
2	8531 Sherwood Rd.	1100
2	504 Leatherwood Dr.	2750
1	951 Sherwood Rd.	1600
2	504 Windsor Ave.	1050
1	1058 North Indian Blvd.	1500
2	820 Ridge Ave.	1700
1	87 Vine Rd.	1160

10 rows returned in 0.01 seconds

11. List the office number, address, and monthly rent for properties whose owners live in Washington state but do not own two-bedroom properties.

The screenshot shows the Oracle Application Express interface. The SQL command window contains the following query:

```
SELECT p.OFFICE_NUM, p.ADDRESS, p.MONTHLY_RENT
FROM PROPERTY p
JOIN OWNER o ON p.OWNER_NUM = o.OWNER_NUM
WHERE o.STATE = 'WA' AND p.BDRMS <> 2;
```

The Results tab displays the following data:

OFFICE_NUM	ADDRESS	MONTHLY_RENT
1	782 Queen Ln.	1900
2	474 Goldfield St.	1700
2	504 Leatherwood Dr.	2750
1	951 Sherwood Rd.	1600
2	504 Windsor Ave.	1050
2	820 Ridge Ave.	1700

6 rows returned in 0.01 seconds

13. Find the service ID and property ID for each service request whose estimated hours are greater than the number of estimated hours on every service request on which the category number is 5.

ORACLE® Application Express

Welcome CORAL (Logout)

Home Application Builder SQL Workshop Team Development Administration

Home SQL Workshop SQL Commands Schema CORAL

Autocommit Rows 10 Save Run

```
SELECT sr.SERVICE_ID, sr.PROPERTY_ID
FROM SERVICE_REQUEST sr
WHERE sr.EST_HOURS > ALL (
  SELECT sr2.EST_HOURS FROM SERVICE_REQUEST sr2 WHERE sr2.CATEGORY_NUMBER = 5
);
```

Results Explain Describe Saved SQL History

SERVICE_ID	PROPERTY_ID
6	4
8	9
5	8

3 rows returned in 0.01 seconds Download

Workspace: CORAL User: CORAL

Application Express 4.0.2.00.09
Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.

15. Repeat Exercise 14(List the address, square footage, owner number, service ID, number of estimated hours, and number of spent hours for each service request on which the category number is 4.), but this time be sure each property is included regardless of whether the property currently has any service requests for category 4.

ORACLE Application Express

Welcome CORAL (Logged)

Home Application Builder SQL Workshop Team Development Administration

Home > SQL Workshop > SQL Commands

Schema: CORAL

Autocommit Rows: 10 Save Run

```
SELECT p.ADDRESS, p.SQR_FT, p.OWNER_NUM, sr.SERVICE_ID, sr.EST_HOURS, sr.SPENT_HOURS
FROM PROPERTY p
LEFT JOIN SERVICE_REQUEST sr ON p.PROPERTY_ID = sr.PROPERTY_ID AND sr.CATEGORY_NUMBER = 4;
```

Coral S. Schmidt Montilla
#148830

Results Explain Describe Saved SQL History

ADDRESS	SQR_FT	OWNER_NUM	SERVICE_ID	EST_HOURS	SPENT_HOURS
30 West Thomas Rd.	1600	M0100	2	1	0
782 Queen Ln.	2100	AK0102	4	1	0
9080 Sunnaha Ave.	1100	BH0109	-	-	-
1058 North Indian Blvd.	1705	RE0107	-	-	-
87 Vine Rd.	1125	SI0105	-	-	-
8 Laurel Dr.	2125	M0100	-	-	-
474 Goldfield St.	1675	CO0103	-	-	-
504 Leatherwood Dr.	2670	K0104	-	-	-
504 Windsor Ave.	700	PA0101	-	-	-
951 Sherwood Rd.	1300	LO0108	-	-	-

More than 10 rows available. Increase rows selector to view more rows.
10 rows returned in 0.00 seconds Download

Workspace: CORAL User: CORAL

Application Express 4.0.2.00.09
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Chapter 6:

(A Guide to SQL) Use the Staywell student Accommodation database only.

Case Exercises: Odd Number Case Exercises, pg. 199-200

Use SQL to make the following changes to the StayWell Student Accommodation database (Figures 1-4 through 1-9 in Module 1). After each change, execute an appropriate query to show that the change was made correctly. If directed to do so by your instructor, use the information provided with the Module 3 Exercises to print your output or to save it to a document.

1. Create a LARGE_PROPERTY table with the structure shown in Figure 6-29.

(Hint: If you have trouble creating the primary key, see Figure 3-36 in Module

3.)

COLUMN	TYPE	LENGTH	DECIMAL PLACES	NULLS ALLOWED?	DESCRIPTION
OFFICE_NUM	DECIMAL	2	0	No	Management office number (primary key)
ADDRESS	CHAR	25		No	Address of property (primary key)
BDRMS	DECIMAL	2	0		Number of bedrooms
FLOORS	DECIMAL	2	0		Number of floors
MONTHLY_RENT	DECIMAL	6	2		Monthly rent
OWNER_NUM	CHAR	5			Number of Property owner

FIGURE 6-29 LARGE_PROPERTY table layout

The screenshot displays the Oracle Application Express (APEX) interface. The top navigation bar includes links for Home, Application Builder, SQL Workshop, Team Development, and Administration. The SQL Workshop tab is active, showing the SQL Commands pane. The command entered is:

```
CREATE TABLE LARGE_PROPERTY (  
  OFFICE_NUM DECIMAL(2, 0) NOT NULL,  
  ADDRESS CHAR(25) NOT NULL,  
  BDRMS DECIMAL(2, 0),  
  FLOORS DECIMAL(2, 0),  
  MONTHLY_RENT DECIMAL(6, 2),  
  OWNER_NUM CHAR(5) NOT NULL,  
  PRIMARY KEY (OFFICE_NUM, ADDRESS)  
);
```

The Results pane at the bottom shows the message "Table created." and the execution time "0.01 seconds". A small pop-up window in the center of the screen displays the user's name "Coral S. Schmidt Montilla" and the session ID "#148830".

3. StayWell has increased the monthly rent of each large property by \$150. Update the monthly rents in the **LARGE_PROPERTY** table accordingly.

The screenshot shows the Oracle Application Express interface. The top navigation bar includes 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. The breadcrumb trail is 'Home > SQL Workshop > SQL Commands'. The 'Schema' dropdown is set to 'CORAL'. The SQL command area contains the following text:

```
UPDATE LARGE_PROPERTY  
SET MONTHLY_RENT = MONTHLY_RENT + 150;
```

Below the command area, the results section shows:

6 row(s) updated.
0.01 seconds

The bottom status bar indicates 'Workspace: CORAL User: CORAL' and 'Application Express 4.0.2.00.09'.

5. Insert a row into the **LARGE_PROPERTY** table for a new property. The office number is 1, the address is 2643 Lugsí Dr, the number of bedrooms is 3, the number of floors is 2, the monthly rent is \$775, and the owner number is MA111.

The screenshot shows the Oracle Application Express interface. The top navigation bar includes 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. The breadcrumb trail is 'Home > SQL Workshop > SQL Commands'. The 'Schema' dropdown is set to 'CORAL'. The SQL command area contains the following text:

```
INSERT INTO LARGE_PROPERTY (OFFICE_NUM, ADDRESS, BDRMS, FLOORS, MONTHLY_RENT, OWNER_NUM)  
VALUES (1, '2643 Lugsí Dr', 3, 2, 775, 'MA111');
```

Below the command area, the results section shows:

1 row(s) inserted.
0.00 seconds

The bottom status bar indicates 'Workspace: CORAL User: CORAL' and 'Application Express 4.0.2.00.09'.

7. The property is managed by Columbia City with the address 105 North Illinois Rd is in the process of being remodeled and the number of bedrooms is unknown. Change the bedrooms value in the LARGE_PROPERTY table to null.

The screenshot shows the Oracle Application Express interface. The top navigation bar includes 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. The 'SQL Workshop' tab is active, showing the 'SQL Commands' page. The 'Autocommit' checkbox is checked, and the 'Rows' dropdown is set to 10. The SQL command entered is:
`UPDATE LARGE_PROPERTY
SET BDRMS = NULL
WHERE OFFICE_NUM = 1 AND ADDRESS = '105 North Illinois Rd';`
A floating window displays the user 'Coral S. Schmidt Montilla' with ID '#148830'. Below the command area, the 'Results' tab shows '0 row(s) updated.' and '0.00 seconds'. The footer indicates 'Workspace: CORAL User: CORAL' and 'Application Express 4.0.2.00.09'.

9. Change the OCCUPIED column in the LARGE_PROPERTY table to N for property ID 9.

The screenshot shows the Oracle Application Express interface. The top navigation bar includes 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. The 'SQL Workshop' tab is active, showing the 'SQL Commands' page. The 'Autocommit' checkbox is checked, and the 'Rows' dropdown is set to 10. The SQL command entered is:
`UPDATE LARGE_PROPERTY
SET OCCUPIED = 'N'
WHERE ADDRESS = 'Insert address of property ID 9 here';`
A floating window displays the user 'Coral S. Schmidt Montilla' with ID '#148830'. Below the command area, the 'Results' tab shows '0 row(s) updated.' and '0.00 seconds'. The footer indicates 'Workspace: CORAL User: CORAL' and 'Application Express 4.0.2.00.09'.

11. Delete the LARGE_PROPERTY table from the database.

The screenshot displays the Oracle Application Express (APEX) interface. At the top, the header includes the Oracle logo and 'Application Express' text, along with a user welcome message 'Welcome CORAL (LOGOUT)'. Below the header is a navigation bar with tabs: 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. The 'SQL Workshop' tab is active, showing a breadcrumb trail 'Home > SQL Workshop > SQL Commands'. A toolbar contains options for 'Autocommit' (checked), 'Rows' (set to 10), 'Save', and 'Run'. The main workspace contains the SQL command: `DROP TABLE LARGE_PROPERTY;`. A floating notification window in the center of the workspace displays the user's name 'Coral S. Schmidt Montilla' and session ID '#148830'. Below the workspace, the 'Results' section shows the output: 'Table dropped.' and '0.01 seconds'. The footer of the interface indicates the workspace is 'CORAL User: CORAL' and provides copyright information for Oracle.

ORACLE Application Express

Welcome CORAL (LOGOUT)

Home Application Builder SQL Workshop Team Development Administration

Home > SQL Workshop > SQL Commands

Schema CORAL

Autocommit Rows 10 Save Run

DROP TABLE LARGE_PROPERTY;

Coral S. Schmidt Montilla
#148830

Results Explain Describe Saved SQL History

Table dropped.

0.01 seconds

Workspace: CORAL User: CORAL

Application Express 4.0.2.00.09
Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.

Chapter 7:

(A Guide to SQL) Use the Staywell student Accommodation database only.

Case Exercises: Odd Numbers: pgs. 237-238

Use SQL to make the following changes to StayWell Student Accommodation database (Figures 1-4 through 1-9 in Module 1). After each change, execute an appropriate query to show that the change was made correctly. If directed to do so by your instructor, use the information provided with the Module 3 Exercises to print your output or save it to a document. For any exercises that use commands not supported by your version of SQL, write the command to accomplish the task.

1. Create a view named SMALL_PROPERTY. It consists of the property ID, office number, bedrooms, floor, monthly rent, and owner number for every property whose square footage is less than 1,250 square feet.

a. Write and execute the CREATE VIEW command to create the SMALL_PROPERTY view.

The screenshot displays the Oracle Application Express (APEX) interface. At the top, the header includes the Oracle logo and 'Application Express' text, along with a 'Welcome CORAL' message and a 'Logout' link. Below the header is a navigation bar with tabs for 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. The 'SQL Workshop' tab is active, and the breadcrumb trail shows 'Home > SQL Workshop > SQL Commands'. A toolbar at the top of the workspace contains buttons for 'Autocommit', 'Rows' (set to 10), 'Save', and 'Run'. The main workspace area contains the following SQL command:

```
CREATE VIEW SMALL_PROPERTY AS
SELECT PROPERTY_ID, OFFICE_NUM, BDRMS, FLOORS, MONTHLY_RENT, OWNER_NUM
FROM PROPERTY
WHERE SQF_FT < 1250;
```

A floating window is open in the center of the workspace, displaying the user's name 'Coral S. Schmidt Montilla' and their ID '#148830'. Below the workspace, the 'Results' tab is selected, showing the message 'View created.' and the execution time '0.01 seconds'. The footer of the interface indicates the workspace is 'CORAL User: CORAL' and the application version is 'Application Express 4.0.2.00.09'.

b. Write and execute the command to retrieve the office number, property ID, and monthly rent for every property in the SMALL_PROPERTY view with a monthly rent of \$1150 or more.

The screenshot shows the Oracle Application Express interface. At the top, there's a navigation bar with 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. Below this, a breadcrumb trail shows 'Home > SQL Workshop > SQL Commands'. The main area contains a text editor with the following SQL command:

```
SELECT OFFICE_NUM, PROPERTY_ID, MONTHLY_RENT
FROM SMALL_PROPERTY
WHERE MONTHLY_RENT >= 1150;
```

Below the editor, a 'Results' tab is active, displaying a table with the following data:

OFFICE_NUM	PROPERTY_ID	MONTHLY_RENT
1	3	1200
1	5	1160

Below the table, it says '2 rows returned in 0.00 seconds' and there is a 'Download' link. At the bottom of the interface, the workspace is identified as 'CORAL User: CORAL' and the language is set to 'en'. The footer also includes the copyright information: 'Application Express 4.0.2.00.09. Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.'

c. Write and execute the query that the DBMS actually executes.

ORACLE Application Express

Welcome CORAL (Logout)

Home Application Builder SQL Workshop Team Development Administration

Home SQL Workshop SQL Commands Schema CORAL

Autocommit Rows 10 Save Run

```
SELECT OFFICE_NUM, PROPERTY_ID, MONTHLY_RENT
FROM (SELECT PROPERTY_ID, OFFICE_NUM, BDRMS, FLOORS, MONTHLY_RENT, OWNER_NUM
      FROM PROPERTY
      WHERE SQR_FT < 1250)
WHERE MONTHLY_RENT >= 1150;
```

Coral S. Schmidt Montilla
#148830

Results Explain Describe Saved SQL History

OFFICE_NUM	PROPERTY_ID	MONTHLY_RENT
1	3	1200
1	5	1160

2 rows returned in 0.00 seconds Download

Workspace: CORAL User: CORAL

Application Express 4.0.2.00.09
Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.

d. Does updating the database through this view create any problems? If so, what are they? If not, why not?

Updating the database through this view might create problems because views based on multiple tables, or with specific conditions like the one defined for `SMALL_PROPERTY`, are often not updatable. In this case, Oracle would not allow you to update the `SMALL_PROPERTY` view directly because it includes a condition based on square footage (`SQR_FT < 1250`), which restricts the view. Additionally, if there are columns like calculated fields or complex joins, these may prevent updates as well. Therefore, any attempt to update such a view could fail or require special permissions and triggers to handle updates.

3. Create a view named **MONTHLY_RENTS**. It consists of two columns: The first is the number of bedrooms, and the second is the average monthly rent for all properties in the **PROPERTY** table that have that number of bedrooms. Use **AVERAGE_RENT** as the column name for the average monthly rent. Group and order the rows by number of bedrooms.

a. Write and execute the **CREATE VIEW** command to create the **MONTHLY_RENTS** view.

The screenshot displays the Oracle Application Express (APEX) web interface. At the top, the navigation bar includes links for Home, Application Builder, SQL Workshop, Team Development, and Administration. The SQL Workshop tab is active, showing a breadcrumb trail: Home > SQL Workshop > SQL Commands. The main editor area contains the following SQL command:

```
CREATE VIEW MONTHLY_RENTS AS
SELECT BDRMS, AVG(MONTHLY_RENT) AS AVERAGE_RENT
FROM PROPERTY
GROUP BY BDRMS;
```

Below the editor, the 'Results' tab is selected, displaying the message 'View created.' and the execution time '0.00 seconds'. A small floating window in the center of the screen shows the user's name 'Coral S. Schmidt Montilla' and their ID '#148830'. The bottom status bar indicates the workspace is 'CORAL User: CORAL' and the application version is 'Application Express 4.0.2.00.09'.

b. Write and execute the command to retrieve the square footage and average fee for each square footage for which the average fee is greater than \$1,100.

Oracle Application Express interface showing the SQL Workshop. The query executed is:

```
SELECT SQF_FT, AVG(MONTHLY_RENT) AS AVERAGE_FEE
FROM PROPERTY
GROUP BY SQF_FT
HAVING AVG(MONTHLY_RENT) > 1100;
```

The results table displays the following data:

SQF_FT	AVERAGE_FEE
1300	1600
1125	1160
2125	2660
1100	1200
1675	1700
1705	1500
2670	2750
1600	1400
2100	1900
1490	1700

10 rows returned in 0.00 seconds

c. Write and execute the query that the DBMS actually executes.

Oracle Application Express interface showing the SQL Workshop. The query executed is:

```
SELECT SQF_FT, AVG(MONTHLY_RENT) AS AVERAGE_FEE
FROM PROPERTY
GROUP BY SQF_FT
HAVING AVG(MONTHLY_RENT) > 1100;
```

The results table displays the following data:

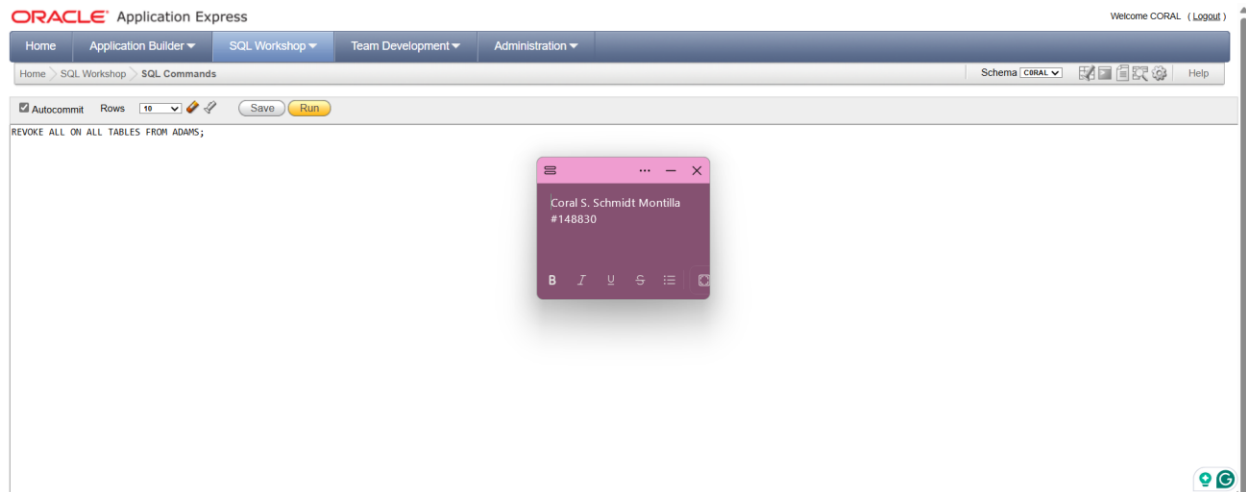
SQF_FT	AVERAGE_FEE
1300	1600
1125	1160
2125	2660
1100	1200
1675	1700
1705	1500
2670	2750
1600	1400
2100	1900
1490	1700

10 rows returned in 0.00 seconds

d. Does updating the database through this view create any problems? If so, what are they? If not, why not?

Updating the database through the `MONTHLY_RENTS` view is not possible because this view contains aggregated data, specifically the average monthly rent grouped by the number of bedrooms. Aggregated fields, like `AVG(MONTHLY_RENT)`, do not directly map back to rows in the underlying table, making it impossible to perform updates, inserts, or deletes through this view. Therefore, any attempt to modify data via this view will result in an error. Only non-aggregated, simple views that directly map to the original table can be updated.

5. Write, but do not execute, the command to revoke all privileges from user Adams.



7. Delete the OWNER_INDEX 3 index from the OWNER table.

The screenshot shows the Oracle Application Express interface. The top navigation bar includes 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. The 'SQL Workshop' tab is active, and the 'SQL Commands' page is displayed. The 'Schema' dropdown is set to 'CORAL'. The 'Autocommit' checkbox is checked, and the 'Rows' dropdown is set to '10'. The SQL command entered in the text area is 'DROP INDEX OWNER_INDEX3;'. The 'Run' button is highlighted. A floating window displays the user 'Coral S. Schmidt Montilla' with ID '#148830'. Below the command area, the 'Results' tab is selected, showing the message 'Index dropped.' and the execution time '0.05 seconds'. The footer indicates 'Workspace: CORAL User: CORAL' and 'Application Express 4.0.2.00.09'.

ORACLE Application Express Welcome CORAL (Logout)

Home Application Builder SQL Workshop Team Development Administration

Home SQL Workshop SQL Commands Schema CORAL

Autocommit Rows 10 Save Run

DROP INDEX OWNER_INDEX3;

Coral S. Schmidt Montilla
#148830

B I U S

Results Explain Describe Saved SQL History

Index dropped.

0.05 seconds

Workspace: CORAL User: CORAL Application Express 4.0.2.00.09 Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.

9. Add the OWNER_NUM column as a foreign key in the PROPERTY table.

The screenshot shows the Oracle Application Express interface. The top navigation bar includes 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. The 'SQL Workshop' tab is active, and the 'SQL Commands' page is displayed. The 'Schema' dropdown is set to 'CORAL'. The 'Autocommit' checkbox is checked, and the 'Rows' dropdown is set to '10'. The SQL command entered in the text area is 'ALTER TABLE PROPERTY ADD CONSTRAINT FK_OWNER_NUM FOREIGN KEY (OWNER_NUM) REFERENCES OWNER(OWNER_NUM);'. The 'Run' button is highlighted. A floating window displays the user 'Coral S. Schmidt Montilla' with ID '#148830'. Below the command area, the 'Results' tab is selected, showing an error message: 'ORA-02275: such a referential constraint already exists in the table'. The execution time is '0.02 seconds'. The footer indicates 'Workspace: CORAL User: CORAL' and 'Application Express 4.0.2.00.09'.

ORACLE Application Express Welcome CORAL (Logout)

Home Application Builder SQL Workshop Team Development Administration

Home SQL Workshop SQL Commands Schema CORAL

Autocommit Rows 10 Save Run

ALTER TABLE PROPERTY
ADD CONSTRAINT FK_OWNER_NUM FOREIGN KEY (OWNER_NUM) REFERENCES OWNER(OWNER_NUM);

Coral S. Schmidt Montilla
#148830

B I U S

Results Explain Describe Saved SQL History

ORA-02275: such a referential constraint already exists in the table

0.02 seconds

Workspace: CORAL User: CORAL Application Express 4.0.2.00.09 Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.

Chapter 8:

(A Guide to SQL) Use the Staywell student Accommodation database only.

Case Exercises: Odd Numbers: pgs. 286-287

Use the StayWell Accommodation Database (see Figures 1-4 through 1-9 in Module 1) to complete the following exercises. If directed to do so by your instructor, use the information provided with the Module 3 Exercises to print your output or save it to a file.

1. List the owner number, first name, and last name for all owners. The first name should appear in uppercase letters and the last name should appear in lowercase letters.

The screenshot shows the Oracle Application Express interface. At the top, there's a navigation bar with tabs: Home, Application Builder, SQL Workshop, Team Development, and Administration. The SQL Workshop tab is active, showing a breadcrumb trail: Home > SQL Workshop > SQL Commands. Below this, there's a toolbar with buttons for Autocommit, Rows (set to 10), Save, and Run. The main area contains a SQL query: `SELECT UPPER(OWNER_NUM), LOWER(FIRST_NAME), LOWER(LAST_NAME) FROM OWNER;`. A modal window is open over the query, displaying the text: `Coral S. Schmidt Montilla` and `#148830`. Below the query, there's a 'Results' section with tabs: Results, Explain, Describe, Saved SQL, and History. The 'Results' tab is active, showing a table with three columns: `UPPER(OWNER_NUM)`, `LOWER(FIRST_NAME)`, and `LOWER(LAST_NAME)`. The table contains 10 rows of data. At the bottom, there's a status bar showing 'Workspace: CORAL User: CORAL' and 'Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.'

UPPER(OWNER_NUM)	LOWER(FIRST_NAME)	LOWER(LAST_NAME)
M0100	elle-may	moore
PA0101	mekalah	patel
AK0102	ceyda	aksay
CO0103	meredith	cole
K0104	jakob	kowalczyk
SI0105	haydon	sinas
BU0106	ernest	burke
RE0107	seth	redman
LO0108	janine	lopez
BH0109	nicole	bianche

3. StayWell is offering a monthly discount for residents who pay their rent on a quarterly basis. The discount is 1.75 percent of the monthly fee. For each property, list the office number, address, owner number, owner's last name, monthly rent, and discount. The discount should be rounded to the nearest dollar.

ORACLE Application Express

Welcome CORAL (Logout)

Home Application Builder SQL Workshop Team Development Administration

Home SQL Workshop SQL Commands Schema CORAL

Autocommit Rows 10 Save Run

```
SELECT P.OFFICE_NUM, P.ADDRESS, P.OWNER_NUM, O.LAST_NAME, P.MONTHLY_RENT,
ROUND(P.MONTHLY_RENT * 0.0175, 0) AS DISCOUNT
FROM PROPERTY P
JOIN OWNER O ON P.OWNER_NUM = O.OWNER_NUM;
```

Coral S. Schmidt Montilla
#146830

B I U G

Results Explain Describe Saved SQL History

OFFICE_NUM	ADDRESS	OWNER_NUM	LAST_NAME	MONTHLY_RENT	DISCOUNT
1	782 Queen Ln.	AK0102	Aksay	1900	33
1	9080 Sunnaha Ave.	BH0109	Bianche	1200	21
2	474 Goldfield St.	CO0103	Cole	1700	30
2	8531 Sherwood Rd.	JO0110	Jones	1100	19
2	504 Leatherwood Dr.	K0104	Kowalczyk	2750	48
1	951 Sherwood Rd.	LO0108	Lopez	1600	28
1	30 West Thomas Rd.	MO100	Moore	1400	25
1	8 Laurel Dr.	MO100	Moore	2650	47
2	504 Windsor Ave.	PA0101	Patel	1050	18
1	1058 North Indian Blvd.	RED107	Redman	1500	26

More than 10 rows available. Increase rows selector to view more rows.
10 rows returned in 0.01 seconds Download

Workspace: CORAL User: CORAL

Application Express 4.0.2.00.09
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5. Write PL/SQL or T-SQL procedures to retrieve and output the office number, address, monthly rent, and owner number for every property whose square footage is equal to the square footage stored in I_SQR_FT.

The screenshot displays the Oracle Application Express (APEX) interface. At the top, the navigation bar includes 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. The 'SQL Workshop' tab is active, showing the 'SQL Commands' page. The 'Schema' dropdown is set to 'CORAL'. Below the navigation bar, there are buttons for 'Autocommit', 'Rows' (set to 10), 'Save', and 'Run'. The main area contains a PL/SQL block:

```
DECLARE
  I_SQR_FT PROPERTY.SQR_FTYPE := 1500; -- Replace with actual square footage
BEGIN
  FOR rec IN (SELECT OFFICE_NUM, ADDRESS, MONTHLY_RENT, OWNER_NUM
              FROM PROPERTY
              WHERE SQR_FT = I_SQR_FT)
  LOOP
    DBMS_OUTPUT.PUT_LINE('Office Num: ' || rec.OFFICE_NUM || ', Address: ' || rec.ADDRESS ||
                          ', Monthly Rent: ' || rec.MONTHLY_RENT || ', Owner Num: ' || rec.OWNER_NUM);
  END LOOP;
END;
```

A modal dialog box is open in the center, displaying the text 'Coral S. Schmidt Montilla #148830'. Below the text are icons for bold (B), italic (I), underline (U), strikethrough (ABC), list (bullets), and a document icon. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

Below the code editor, the 'Results' tab is selected, showing the message 'Statement processed.' and '0.01 seconds'. The footer of the interface indicates 'Workspace: CORAL User: CORAL' and 'Application Express 4.0.2.00.09'.

7. Write a stored procedure in PL/SQL or T-SQL that changes the monthly rent of a property with a given address and office number. How would you use this stored procedure to change the monthly rent for the property with the address “782 Queen Ln.” and office number 1 to \$1,100?

The image displays two screenshots of the Oracle Application Express (APEX) interface, demonstrating the creation and execution of a stored procedure.

Top Screenshot: Creating the Procedure

- Page Header:** ORACLE Application Express, Welcome CORAL (Logout)
- Navigation:** Home, Application Builder, SQL Workshop, Team Development, Administration
- Breadcrumbs:** Home > SQL Workshop > SQL Commands
- Schema:** CORAL
- Code Editor:** Contains the following PL/SQL code:

```
CREATE OR REPLACE PROCEDURE CHANGE_RENT (  
  P_ADDRESS IN PROPERTY.ADDRESS%TYPE,  
  P_OFFICE_NUM IN PROPERTY.OFFICE_NUM%TYPE,  
  P_NEW_RENT IN PROPERTY.MONTHLY_RENT%TYPE)  
IS  
BEGIN  
  UPDATE PROPERTY  
  SET MONTHLY_RENT = P_NEW_RENT  
  WHERE ADDRESS = P_ADDRESS AND OFFICE_NUM = P_OFFICE_NUM;  
  COMMIT;  
END;  
/
```
- Run Dialog:** A modal window shows the user "Coral S. Schmidt Montilla" and session ID "#148830".
- Results:** Shows "Procedure created." and "0.05 seconds".
- Footer:** Workspace: CORAL User: CORAL, Application Express 4.0.2.00.09, Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.

Bottom Screenshot: Executing the Procedure

- Page Header:** ORACLE Application Express, Welcome CORAL (Logout)
- Navigation:** Home, Application Builder, SQL Workshop, Team Development, Administration
- Breadcrumbs:** Home > SQL Workshop > SQL Commands
- Schema:** CORAL
- Code Editor:** Contains the following PL/SQL code:

```
BEGIN  
  CHANGE_RENT('782 Queen Ln', 1, 1100);  
END;  
/
```
- Run Dialog:** A modal window shows the user "Coral S. Schmidt Montilla" and session ID "#148830".
- Results:** Shows "Statement processed." and "0.00 seconds".
- Footer:** Workspace: CORAL User: CORAL, Application Express 4.0.2.00.09, Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.