Murach Chapter 3

How to Retrieve Data From a Single Table

Week 2, Lecture 4,
Spring 2019

Knowledge Points in this lecture

- Expanded Syntax of SELECT clause
- More operators used in WHERE clause:
  - IN, BETWEEN AND, LIKE, IS NULL, IS NOT NULL
- Expanded Syntax of ORDER BY clause
- Nested sort
- Sorting query results by using the following in ORDER BY clause
  - Column alias
  - Expression
- SQL Coding practice

The expanded syntax of the SELECT clause

```
SELECT [ALL|DISTINCT]
    column_specification [[AS] result_column]
    [, column_specification [[AS] result_column]] ...
```

Five ways to code column specifications

- All columns in base table

- Column name in base table

- Concatenation

- Calculation

- Scalar function

- [ ] : Optional; | : Or ;   underlined : default option;   comma: separator in a list
- ALL | DISTINCT:
  - keep all rows including duplicates OR only distinct rows in the query result
- Base table – table stored in the database

The syntax of the WHERE clause with the IN operator

```
WHERE test_expression
    [NOT] IN ({subquery|expression_1 [, expression_2]...})
```

Examples of the IN operator

The IN operator with a list of numeric literals

```
WHERE terms_id IN (1, 3, 4)
```

The IN operator preceded by NOT

```
WHERE vendor_state NOT IN ('CA', 'NV', 'OR')
```

The IN operator with a subquery

```
WHERE vendor_id IN
    (SELECT vendor_id
     FROM invoices
     WHERE invoice_date = '01-MAY-2014')
```

The syntax of the WHERE clause with the BETWEEN operator

```
WHERE test_expression
    [NOT] BETWEEN begin_expression AND end_expression
```

Examples of the BETWEEN operator

The BETWEEN operator with literal values

```
WHERE invoice_date
    BETWEEN '01-MAY-2014' AND '31-MAY-2014'
```

The BETWEEN operator preceded by NOT

```
WHERE vendor_zip_code NOT BETWEEN 93600 AND 93799
```

The BETWEEN operator with a calculated value

```
WHERE invoice_total - payment_total - credit_total
    BETWEEN 200 AND 500
```

The BETWEEN operator with upper and lower limits

```
WHERE invoice_due_date BETWEEN SYSDATE AND (SYSDATE + 30)
```

The syntax of the WHERE clause with the LIKE operator

```
WHERE match_expression [NOT] LIKE pattern
```

Wildcard symbols

% - any string of 0 or more characters
_ : any single character

WHERE clauses that use the LIKE operator

Example 1

```
WHERE vendor_city LIKE 'SAN%'
```

Cities that will be retrieved

"San Diego" and "Santa Ana"

Example 2

```
WHERE vendor_name LIKE 'COMPU_ER%'
```

Vendors that will be retrieved

"Compuserve" and "Computerworld"

Note: Characters in the pattern are case sensitive

The syntax of the WHERE clause with the Is null condition

```
WHERE expression IS [NOT] NULL
```

The contents of the Null_Sample table

```
SELECT *
FROM null_sample
```

	INVOICE_ID	INVOICE_TOTAL
1	1	125
2	2	0
3	3	(null)
4	4	2199.99
5	5	0

NULL – not applicable, not available, unknown

A SELECT statement that retrieves rows with zero values

```
SELECT *
FROM null_sample
WHERE invoice_total = 0
```

	INVOICE_ID	INVOICE_TOTAL
1	2	0
2	5	0

A SELECT statement that retrieves rows with non-zero values

```
SELECT *
FROM null_sample
WHERE invoice_total <> 0
```

	INVOICE_ID	INVOICE_TOTAL
1	1	125
2	4	2199.99

A SELECT statement that retrieves rows with null values

```
SELECT *
FROM null_sample
WHERE invoice_total IS NULL
```

	INVOICE_ID	INVOICE_TOTAL
1	3	(null)

A SELECT statement that retrieves rows without null values

```
SELECT *
FROM null_sample
WHERE invoice_total IS NOT NULL
```

	INVOICE_ID	INVOICE_TOTAL
1	1	125
2	2	0
3	4	2199.99
4	5	0

The expanded syntax of the ORDER BY clause

```
ORDER BY expression [ASC|DESC]
    [, expression [ASC|DESC]] ...
```

An ORDER BY clause that sorts by one column

```
SELECT vendor_name,
    vendor_city || ', ' || vendor_state || ' ' ||
vendor_zip_code AS address
FROM vendors
ORDER BY vendor_name
```

VENDOR_NAME	ADDRESS	
1 ASC Signs	Fresno, CA 93703	
2 AT&T	Phoenix, AZ 85062	
3 Abbey Office Furnishings	Fresno, CA 93722	

Default: ascending (ASC)

An ORDER BY clause that sorts by one column in descending sequence

```
SELECT vendor_name,
    vendor_city || ', ' || vendor_state || ' ' ||
vendor_zip_code AS address
FROM vendors
ORDER BY vendor_name DESC
```

	VENDOR_NAME	ADDRESS	
1	Zylka Design	Fresno, CA 93711	
2	Zip Print & Copy Center	Fresno, CA 93777	
3	Zee Medical Service Co	Washington, IA 52353	

An ORDER BY clause that sorts by three columns

```
SELECT vendor_name,
    vendor_city || ', ' || vendor_state || ' ' ||
        vendor_zip_code AS address
FROM vendors
ORDER BY vendor_state, vendor_city, vendor_name
```

VENDOR_NAME	ADDRESS
1 AT&T	Phoenix, AZ 85062
2 Computer Library	Phoenix, AZ 85023
3 Wells Fargo Bank	Phoenix, AZ 85038
4 Aztek Label	Anaheim, CA 92807
5 Blue Shield of California	Anaheim, CA 92850
6 Diversified Printing & Pub	Brea, CA 92621
7 ASC Signs	Fresno, CA 93703

Nested Sort example
- ORDER BY vendor_state, vendor_city, vendor_name

An ORDER BY clause that uses a column alias

```
SELECT vendor_name,
    vendor_city || ', ' || vendor_state || ' ' ||
        vendor_zip_code AS address
FROM vendors
ORDER BY address, vendor_name
```

VENDOR_NAME	ADDRESS	
1 Aztek Label	Anaheim, CA 92807	
2 Blue Shield of California	Anaheim, CA 92850	
3 Malloy Lithographing Inc	Ann Arbor, MI 48106	
4 Data Reproductions Corp	Auburn Hills, MI 48326	

An ORDER BY clause that uses an expression

```
SELECT vendor_name,
    vendor_city || ', ' || vendor_state || ' ' ||
        vendor_zip_code AS address
FROM vendors
ORDER BY vendor_contact_last_name
    || vendor_contact_first_name
```

	VENDOR_NAME	ADDRESS
1	Dristas Groom & McCormick	Fresno, CA 93720
2	Internal Revenue Service	Fresno, CA 93888
3	US Postal Service	Madison, WI 53707
4	Yale Industrial Trucks-Fresno	Fresno, CA 93706