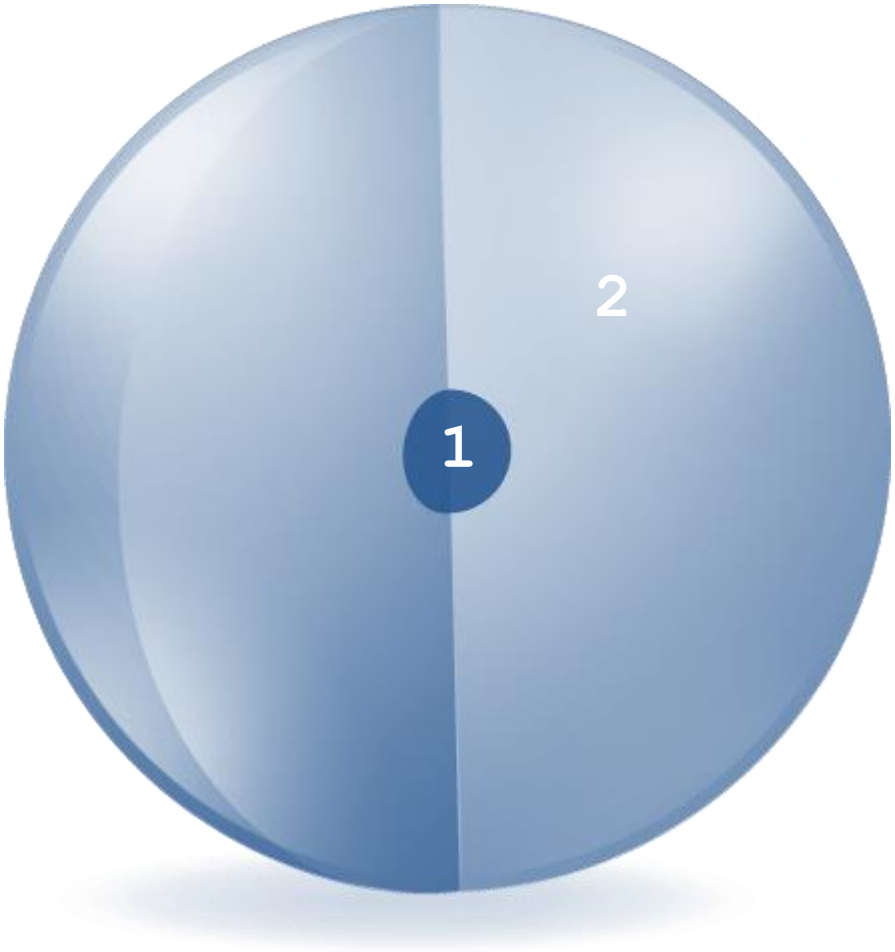
Retrieving Data Using the SQL SELECT Statement

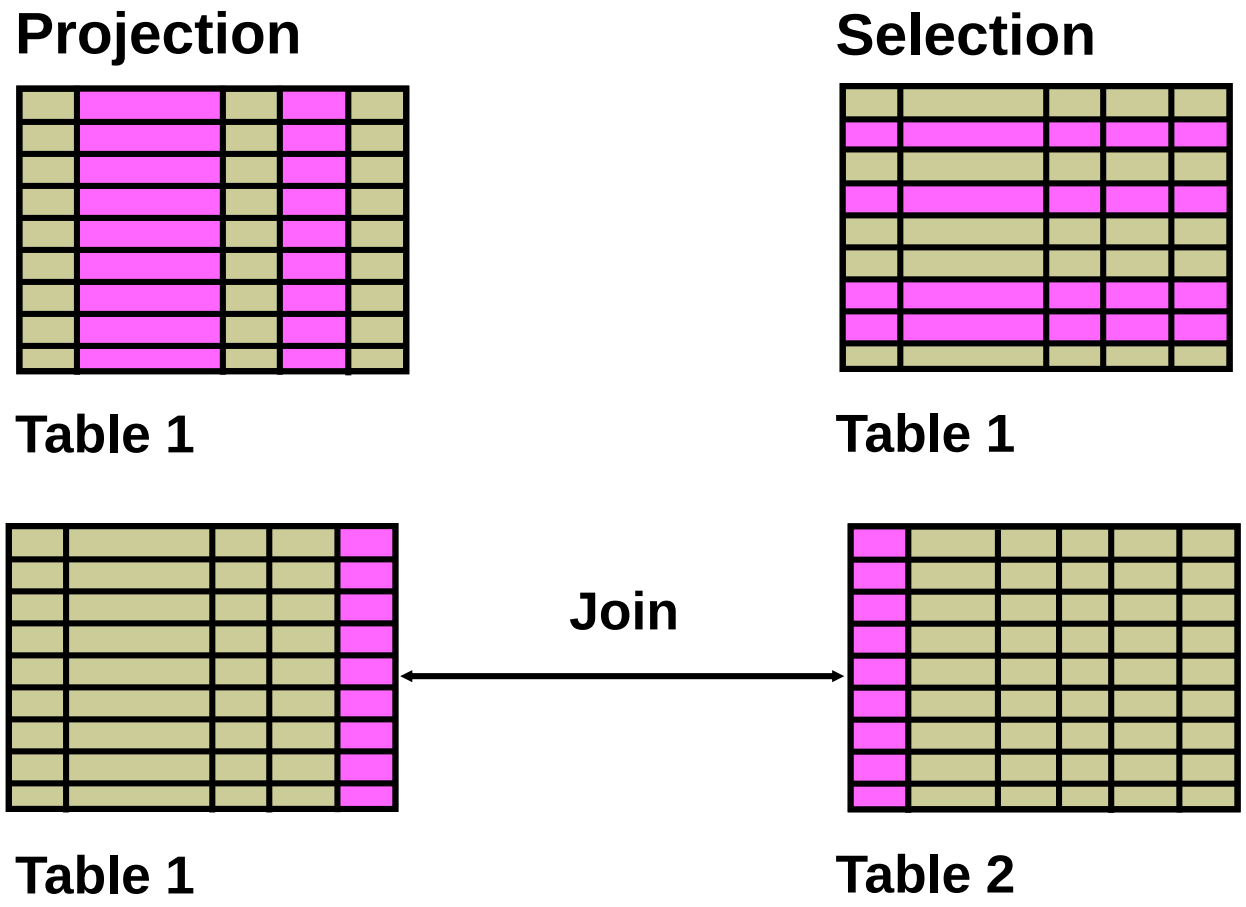
What You will Learn at the end of this Session ?



1 **List the capabilities of SQL SELECT statements**

2 **Execute a basic SELECT statement**

Capabilities of SQL SELECT Statements



Basic SELECT Statement

```
SELECT *|{[DISTINCT] column|expression [alias],...}
FROM    table;
```

SELECT identifies the columns to be displayed**.**

FROM identifies the table containing those columns.

Selecting All Columns

```
SELECT *
FROM   inventories ;
```

	PRODUCT_ID	WAREHOUSE_ID	QUANTITY_ON_HAND
1	3108	8	122
2	3110	8	123
3	3112	8	123
4	3117	8	124
5	3124	8	125
6	3127	8	125
7	3129	8	126
8	3134	8	149
9	3139	8	150
10	3140	8	150
11	3143	8	151

...

Selecting Specific Columns

```
SELECT product_id, quantity_on_hand
FROM   inventories ;
```

	PRODUCT_ID	QUANTITY_ON_HAND
1	3108	122
2	3110	123
3	3112	123
4	3117	124
5	3124	125
6	3127	125
7	3129	126
8	3134	149
9	3139	150
10	3140	150
11	3143	151

...

Writing SQL Statements

SQL statements are not case sensitive

SQL statements can be entered on one or more lines.

Keywords cannot be abbreviated or split across lines.

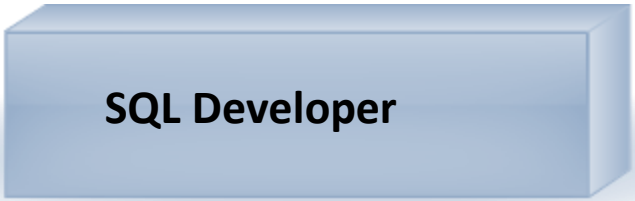
In SQL Developer, SQL statements can be optionally terminated by a semicolon (;). Semicolons are required when you execute multiple SQL statements

Clauses are usually placed on separate lines.

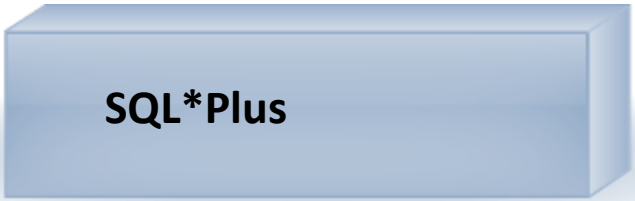
Indents are used to enhance readability.

In SQL*Plus, you are required to end each SQL statement with a semicolon (;).

Column Heading Defaults



Default heading alignment: Left-aligned
Default heading display: Uppercase

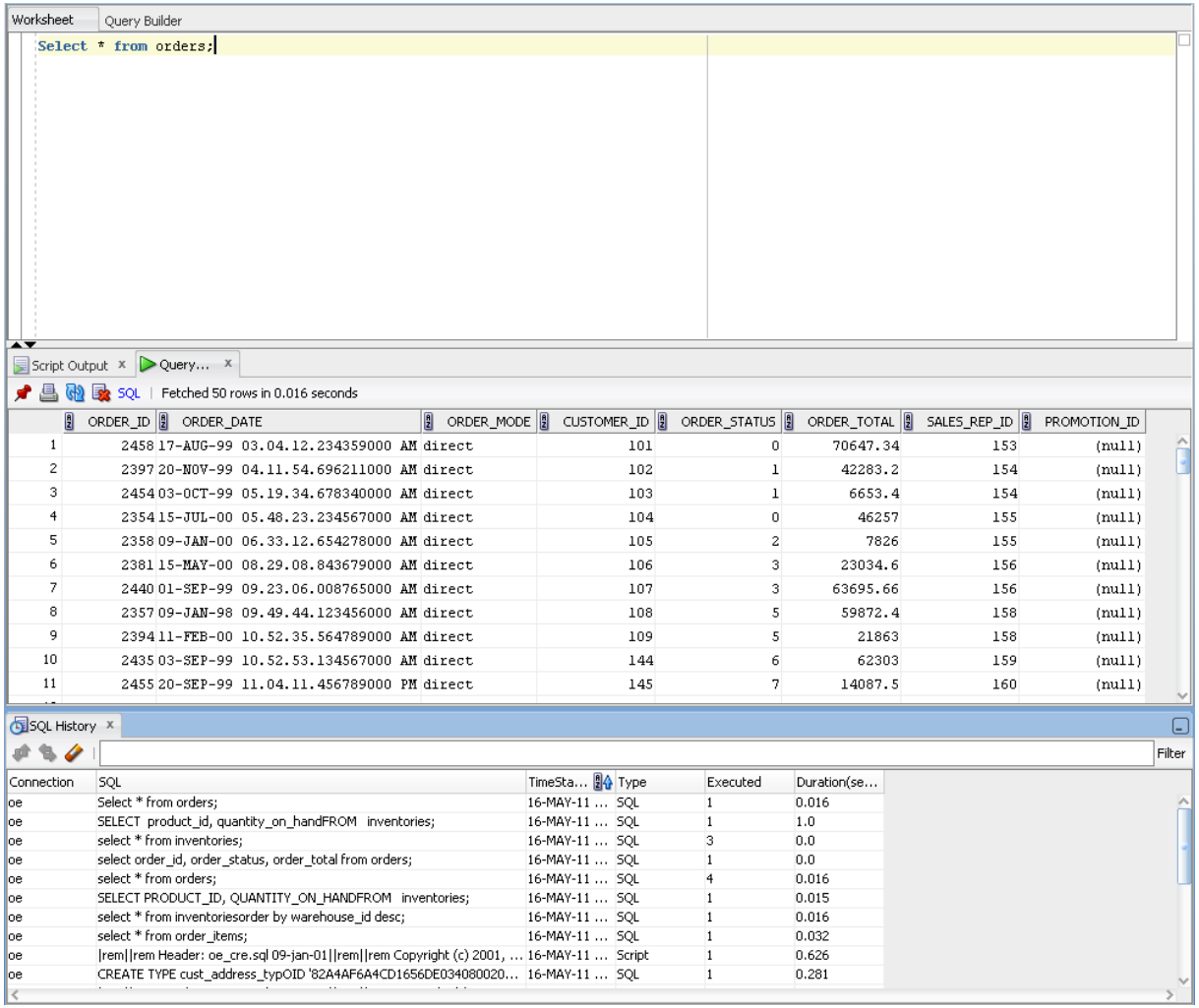


Character and Date column headings are left-aligned.
Number column headings are right-aligned.
Default heading display: Uppercase

Column Heading Defaults

	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER
1	100	Steven	King	SKING	515.123.4567
2	101	Neena	Kochhar	NKOCHHAR	515.123.4568
3	102	Lex	De Haan	LDEHAAN	515.123.4569
4	103	Alexander	Hunold	AHUNOLD	590.423.4567
5	104	Bruce	Ernst	BERNST	590.423.4568
6	105	David	Austin	DAUSTIN	590.423.4569
7	106	Valli	Pataballa	VPATABAL	590.423.4560
8	107	Diana	Lorentz	DLORENTZ	590.423.5567
9	108	Nancy	Greenberg	NGREENBE	515.124.4569
10	109	Daniel	Faviet	DFAVIET	515.124.4169

SQL Developer sample screenshot



Worksheet

Query Result

History

Arithmetic Expressions

•Create expressions with number and date data by using arithmetic operators.

Operator	Description
+	Add
-	Subtract
*	Multiply
/	Divide

Using Arithmetic Operators

```
SELECT   product_id,  quantity_on_hand, quantity_on_hand+200
FROM   inventories ;
```

	PRODUCT_ID	QUANTITY_ON_HAND	QUANTITY_ON_HAND+200
1	3108	122	322
2	3110	123	323
3	3112	123	323
4	3117	124	324
5	3124	125	325
6	3127	125	325
7	3129	126	326
8	3134	149	349
9	3139	150	350
10	3140	150	350
11	3143	151	351

Operator Precedence

```
SELECT   product_id,  quantity_on_hand,  12*quantity_on_hand+200
FROM   inventories ;
```

1

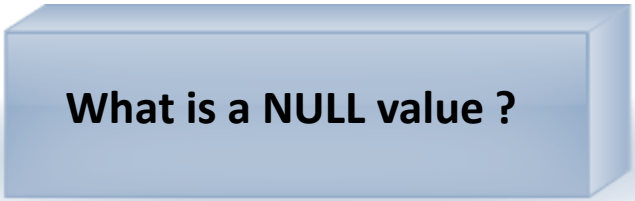
	PRODUCT_ID	QUANTITY_ON_HAND	12*QUANTITY_ON_HAND+200
1	3108	122	1664
2	3110	123	1676
3	3112	123	1676
4	3117	124	1688

```
SELECT   product_id,  quantity_on_hand,  12*(quantity_on_hand+200)
FROM   inventories ;
```

2

	PRODUCT_ID	QUANTITY_ON_HAND	12*(QUANTITY_ON_HAND+200)
1	3108	122	3864
2	3110	123	3876
3	3112	123	3876
4	3117	124	3888

What is a NULL value ?



If a row does not have an entry for a particular column, that value is said to be NULL..

It is the absence of any character, zero, blank space etc.

Arithmetic operations on a NULL value always return a NULL value.

Defining a Null Value

- Null is a value that is unavailable, unassigned, unknown, or inapplicable.
- Null is not the same as zero or a blank space.

```
SELECT   order_id,  ROUND (order_date)  "ORDER_DATE",
         customer_id, promotion_id
FROM   orders ;
```

	ORDER_ID	ORDER_DATE	CUSTOMER_ID	PROMOTION_ID
1	2458	17-AUG-99	101	(null)
2	2397	20-NOV-99	102	(null)
3	2454	03-OCT-99	103	(null)
4	2354	15-JUL-00	104	(null)
5	2358	09-JAN-00	105	(null)

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Note: Round() will be explained later during the course of the presentation.

Null Values in Arithmetic Expressions

- Arithmetic expressions containing a null value evaluate to null.

```
SELECT   order_id, 12*order_id*promotion_id
FROM   orders ;
```

	ORDER_ID	12*ORDER_ID*PROMOTION_ID
1	2458	(null)
2	2397	(null)
3	2454	(null)
4	2354	(null)
5	2358	(null)
6	2381	(null)
7	2440	(null)
8	2357	(null)
9	2394	(null)
10	2435	(null)
11	2455	(null)

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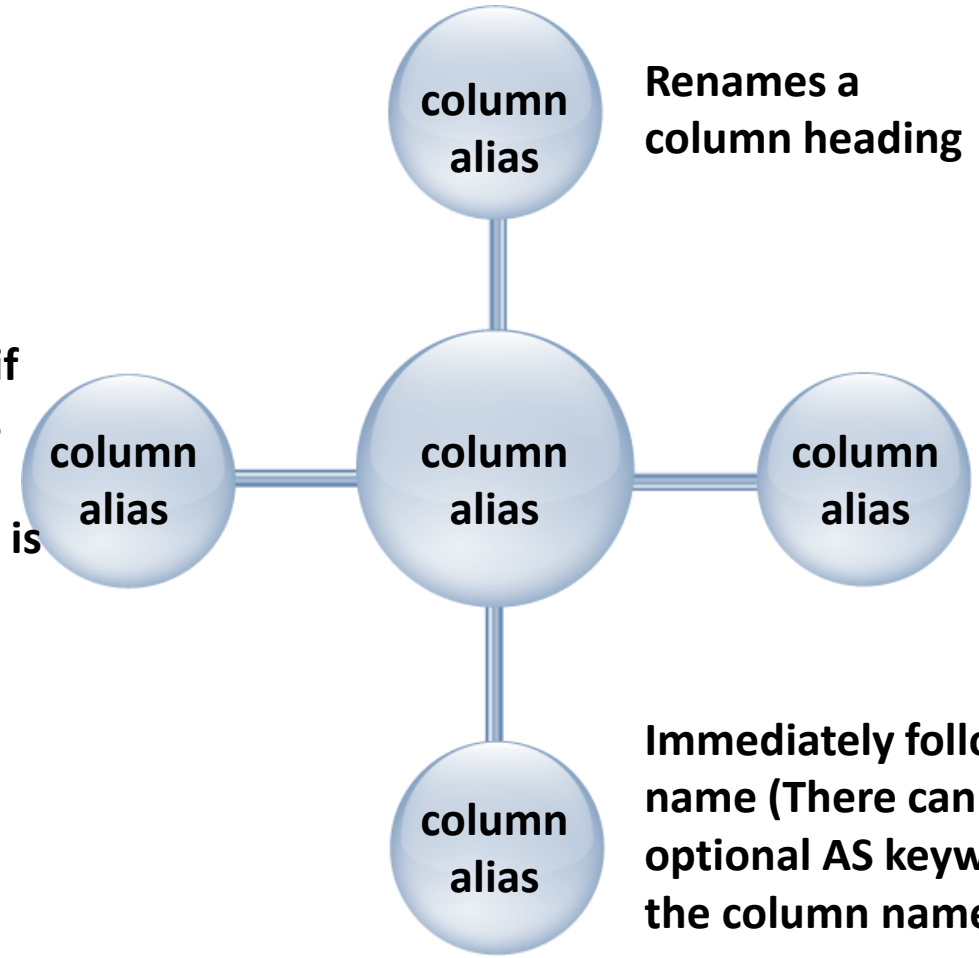
Defining a Column Alias



Renames a column heading

Requires double quotation marks if it contains spaces or special characters, or if it is case-sensitive

Is useful with calculations

Immediately follows the column name (There can also be the optional AS keyword between the column name and the alias.)

Using Column Aliases

```
SELECT   product_id  AS  Product , quantity_on_hand  Quantity
FROM   inventories ;
```

	PRODUCT	QUANTITY
1	3108	122
2	3110	123
3	3112	123
4	3117	124

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```
SELECT   order_id "Order " ,  ROUND(order_date)  "Date of Order"
FROM orders ;
```

	Order	Date of Order
1	2458	17-AUG-99
2	2397	20-NOV-99
3	2454	03-OCT-99
4	2354	15-JUL-00

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Concatenation Operator

- A concatenation operator:
  - Links columns or character strings to other columns
  - Is represented by two vertical bars (||)
  - Creates a resultant column that is a character expression

```
SELECT   first_name || last_name  AS  "NAME"
FROM    customers ;
```

	NAME
1	EllenAbel
2	SundarAnde
3	MozheAtkinson
4	DavidAustin
5	HermannBaer
6	ShelliBaida
7	AmitBanda
8	ElizabethBates

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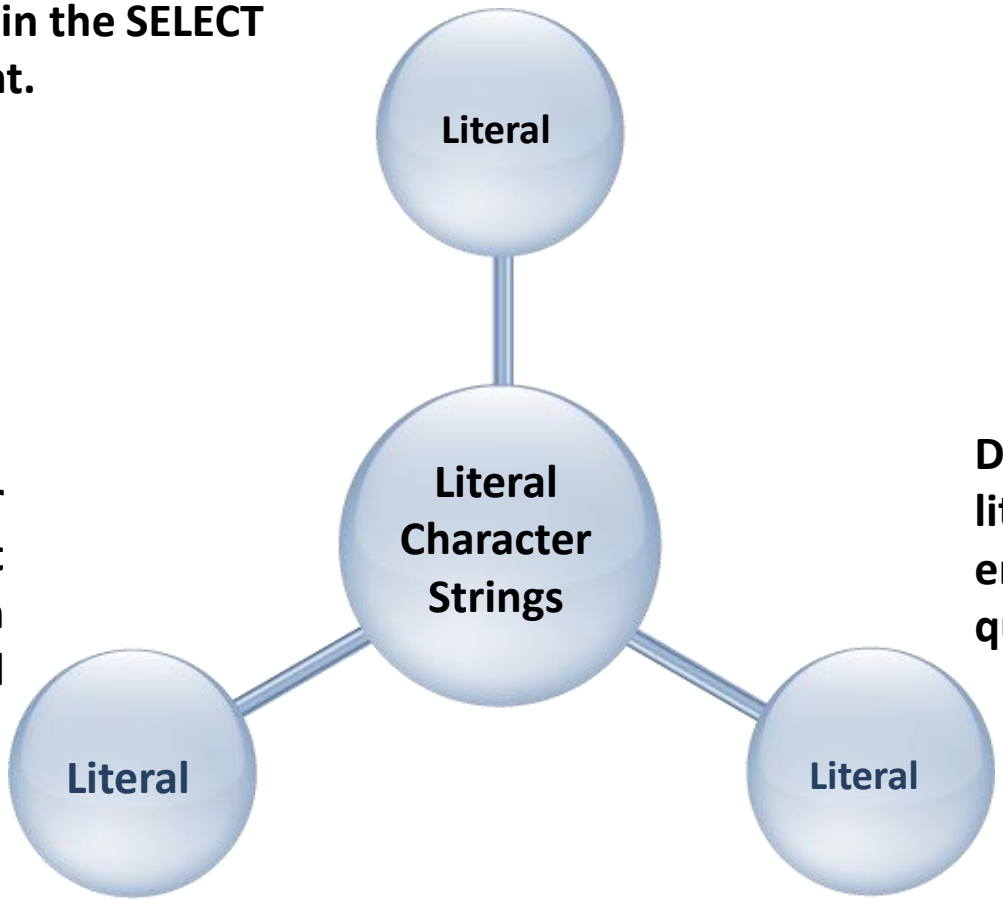
Literal Character Strings

A literal is a character, a number, or a date that is included in the SELECT statement.



Each character string is output once for each row returned

Date and character literal values must be enclosed within single quotation marks.

Using Literal Character Strings

```
SELECT   product_id  ||  ' is in Warehouse '  ||  warehouse_id
         AS  "Product-Warehouse"
FROM   inventories ;
```

	Product-Warehouse
1	1733 is in Warehouse 1
2	1734 is in Warehouse 1
3	1737 is in Warehouse 1
4	1738 is in Warehouse 1
5	1745 is in Warehouse 1
6	1748 is in Warehouse 1
7	2278 is in Warehouse 1

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Alternative Quote (q) Operator

- Specify your own quotation mark delimiter.
- Select any delimiter.
- Increase readability and usability.

```
SELECT   department_name  || q ' [ Department's Manager Id: ] '
      ||  manager_id
      AS " Department and Manager "
FROM   departments ;
```

	Department and Manager
1	Administration Department's Manager Id: 200
2	Marketing Department's Manager Id: 201
3	Shipping Department's Manager Id: 124
4	IT Department's Manager Id: 103
5	Sales Department's Manager Id: 149
6	Executive Department's Manager Id: 100
7	Accounting Department's Manager Id: 205
8	Contracting Department's Manager Id:

Duplicate Rows

- The default display of queries is all rows, including duplicate rows.

1

```
SELECT   department_id
FROM   employees ;
```

	DEPARTMENT_ID
1	10
2	20
3	20
4	110
5	110

...

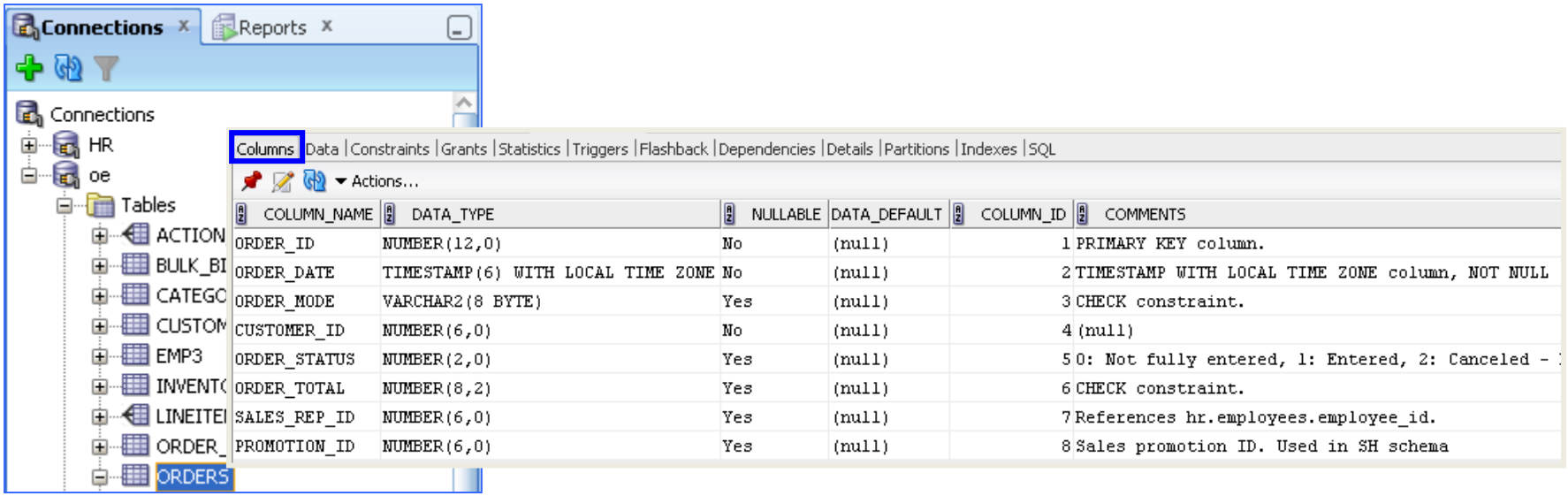
2

```
SELECT  DISTINCT  department_id
FROM   employees ;
```

	DEPARTMENT_ID
1	(null)
2	20
3	90
4	110
5	50
6	80
7	10
8	60

Displaying the Table Structure using SQL Developer

– Select the required table in the “Connections” tree in the SQL Developer and use the “Columns” tab to view the table structure.



Here, the table structure of the Orders table is displayed.

Using the DESCRIBE Command

- Use the DESCRIBE command to display the structure of a table.

```
DESCRIBE   orders ;
```

```
Name          Null     Type
------------ -------- ------------------------------
ORDER_ID      NOT NULL NUMBER(12)
ORDER_DATE    NOT NULL TIMESTAMP(6) WITH LOCAL TIME ZONE
ORDER_MODE             VARCHAR2(8)
CUSTOMER_ID   NOT NULL NUMBER(6)
ORDER_STATUS           NUMBER(2)
ORDER_TOTAL            NUMBER(8,2)
SALES_REP_ID           NUMBER(6)
PROMOTION_ID           NUMBER(6)
```

Quiz

- Identify the `SELECT` statements that execute successfully.

```
1.SELECT first_name, last_name, job_id, salary*12
  AS Yearly Sal
 FROM   employees;

2.SELECT first_name, last_name, job_id, salary*12
  "yearly sal"
 FROM   employees;

3.SELECT first_name, last_name, job_id, salary AS
  "yearly sal"
 FROM   employees;

4.SELECT first_name+last_name AS name, job_Id,
  salary*12 yearly sal
 FROM   employees;
```

Quiz

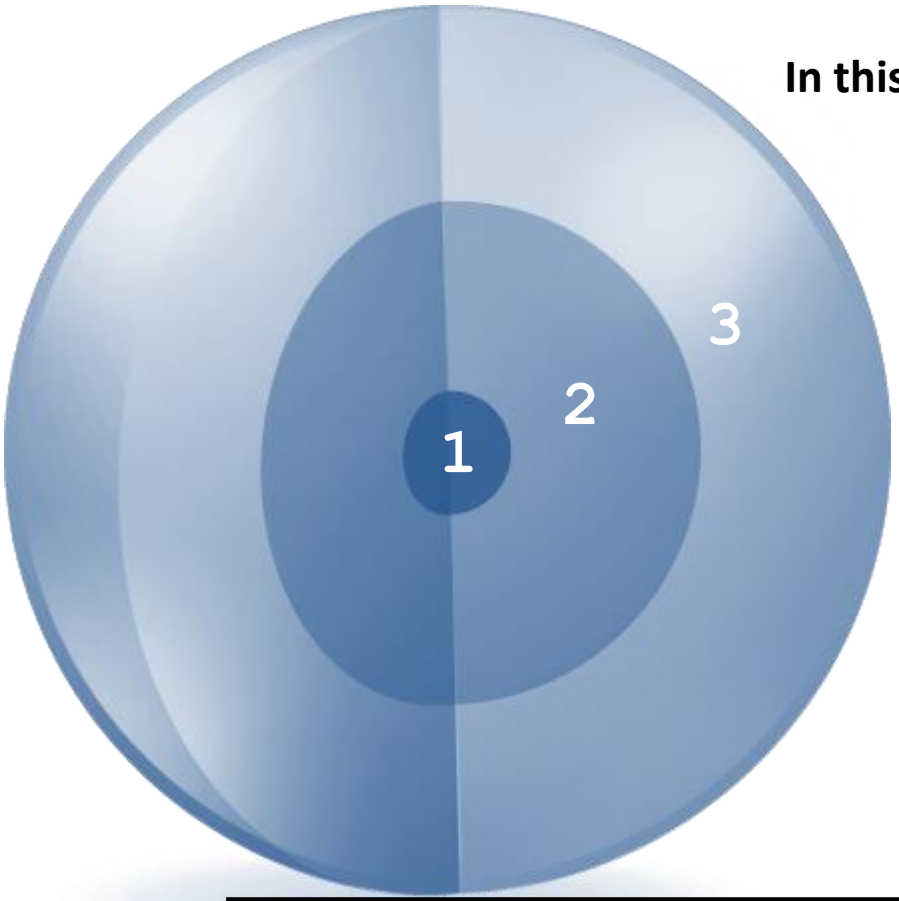
- Identify the SELECT statements that execute successfully.

```
5.SELECT product_id, warehouse_id AS "Product",
 "Warehouse"
 FROM   employees;

6.SELECT order_id|| is in ||order_mode|| mode AS
  "Order Mode"
 FROM   inventories;

7.Write an SQL query to display all the
 quantity_on_hand in the warehouse with
 warehouse_id
```

Session Summary



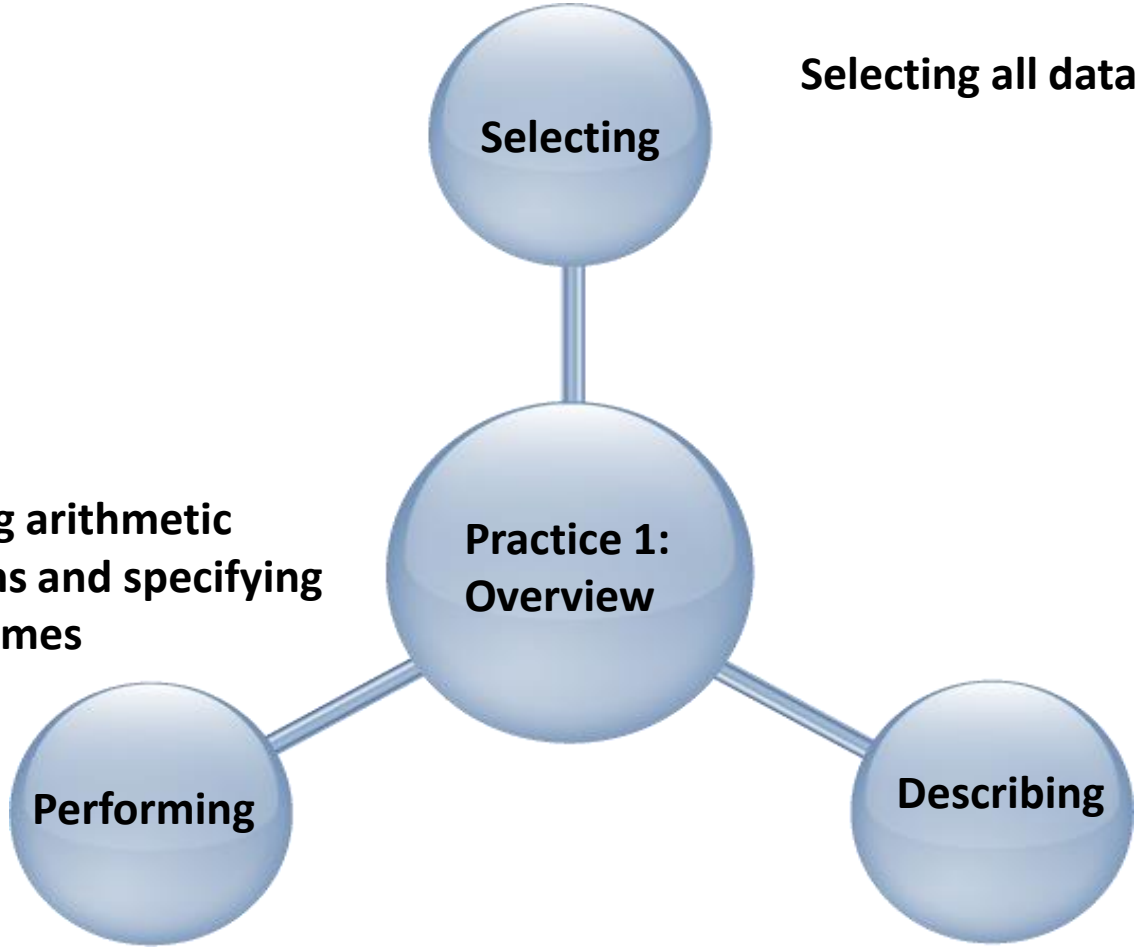
In this lesson, you should have learned how to:

1. Returns all rows and columns from a table
2. Returns specified columns from a table
3. Uses column aliases to display more descriptive column headings

Syntax :

```
SELECT *|{[DISTINCT] column|expression [alias],...}
FROM table;
```

Practice 1: Overview This practice covers the following topics:



Selecting all data from different tables

Performing arithmetic calculations and specifying column names

Describing the structure of tables