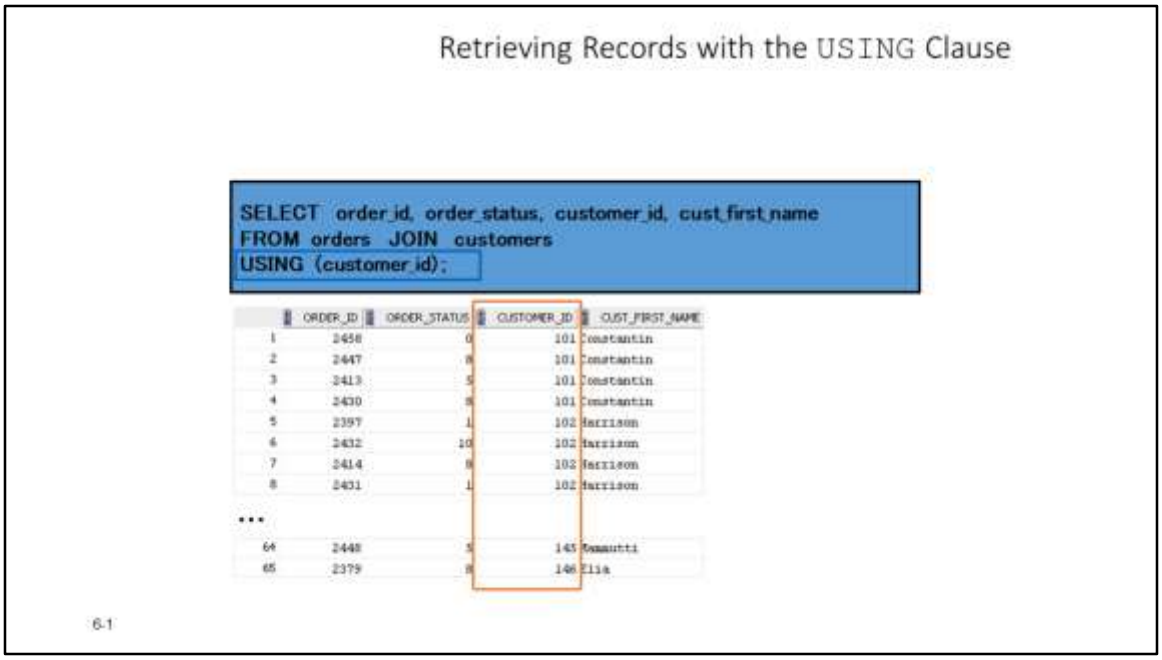


Retrieving Records with the USING Clause

In the example in the slide, the CUSTOMER_ID columns in the ORDERS and CUSTOMERS tables are joined and thus the CUST_FIRST_NAME of the customer who placed each order is shown.

Using Table Aliases with the `USING` clause

When joining with the `USING` clause, you cannot qualify a column that is used in the `USING` clause itself. Furthermore, if that column is used anywhere in the SQL statement, you cannot alias it. For example, in the query mentioned in the slide, you should not alias the `location_id` column in the `WHERE` clause because the column is used in the `USING` clause.

The columns that are referenced in the `USING` clause should not have a qualifier (table name or alias) anywhere in the SQL statement. For example, the following statement is valid:

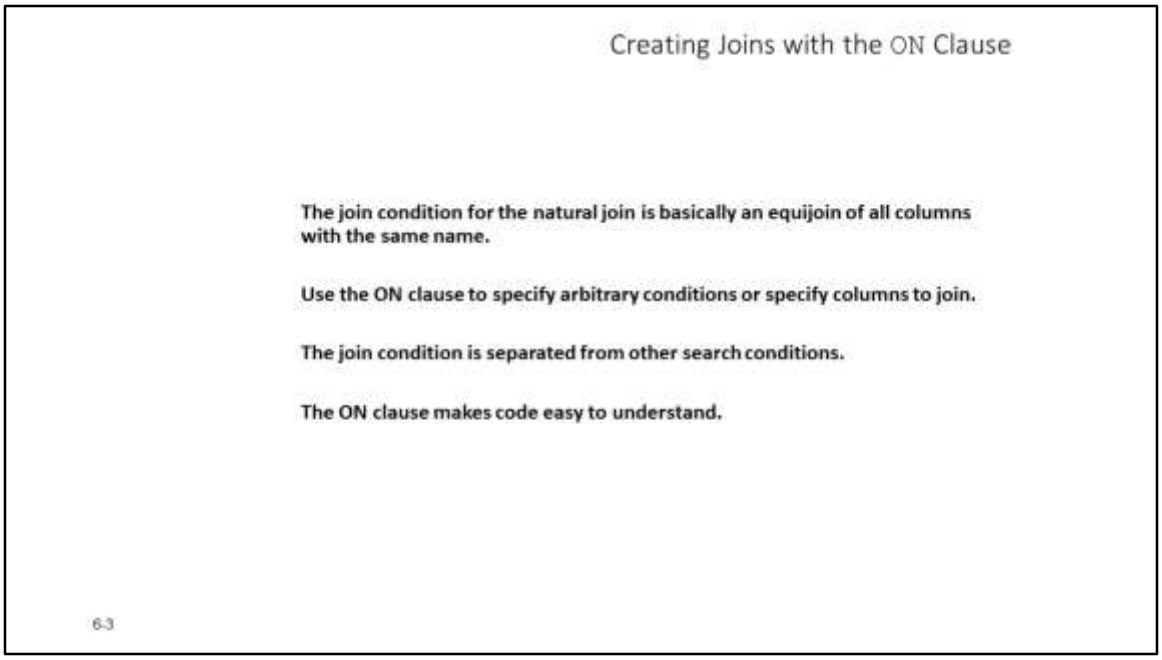
```
SELECT l.city, d.department_name
FROM   locations l JOIN departments d USING
  (location_id)
WHERE  location_id = 1400;
```

The columns that are common in both the tables, but not used in the `USING` clause, must be prefixed with a table alias; otherwise, you get the “column ambiguously defined” error.

In the following statement, `manager_id` is present in both the `employees` and `departments` table; if `manager_id` is not prefixed with a table alias, it gives a “column ambiguously defined” error.

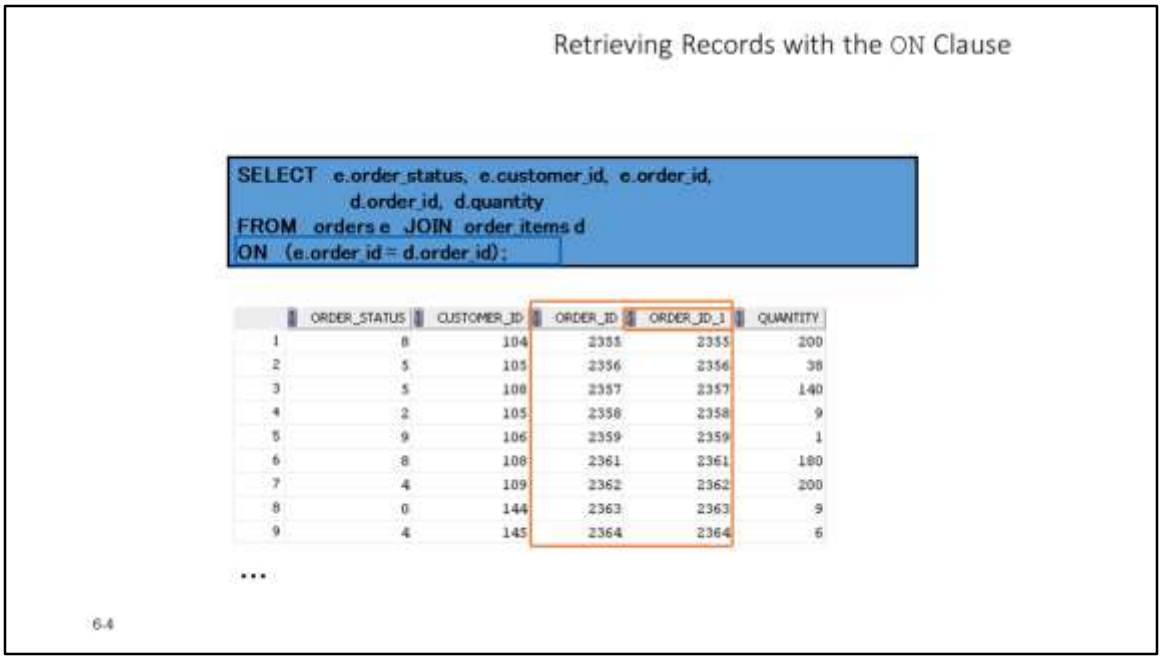
The following statement is valid:

```
SELECT first_name, d.department_name, d.manager_id
FROM   employees e JOIN departments d USING
  (department_id)
WHERE  department_id = 50;
```



Creating Joins with the `ON` Clause

Use the `ON` clause to specify a join condition. With this, you can specify join conditions separate from any search or filter conditions in the `WHERE` clause.

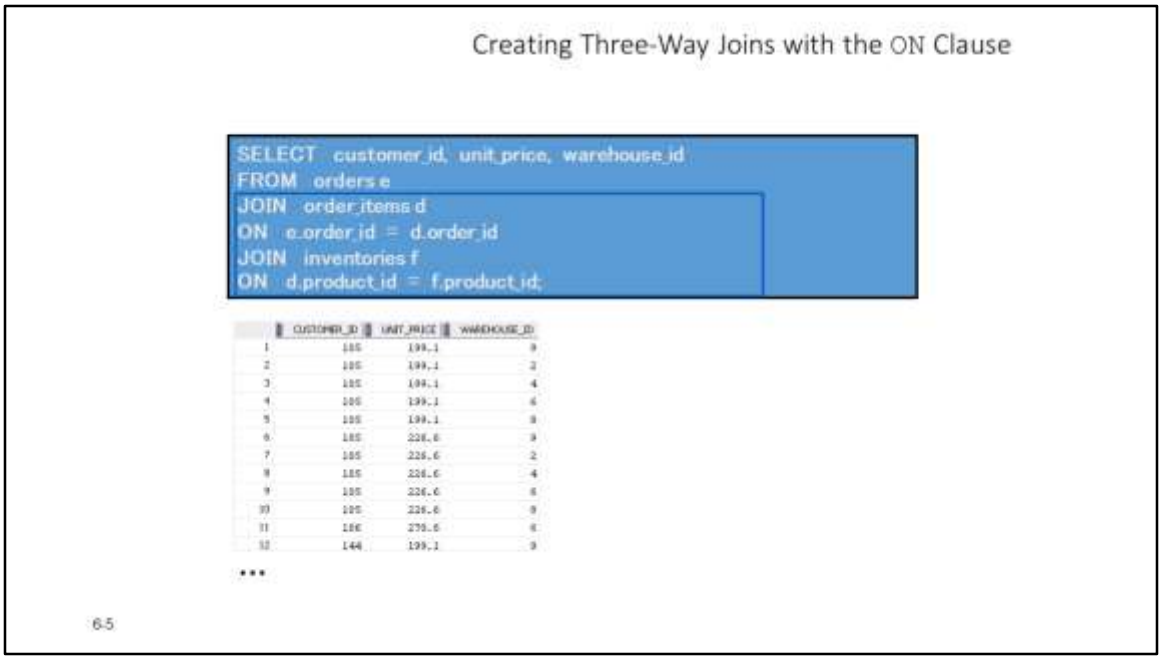


Retrieving Records with the ON Clause

In this example, the ORDER_ID columns in the ORDERSS and ORDER_ITEMS table are joined using the ON clause. Wherever an order_ID in the ORDERS table equals a order ID in the ORDER_ITEMS table, the row is returned. The table alias is necessary to qualify the matching column_names.

You can also use the ON clause to join columns that have different names. The parenthesis around the joined columns, as in the example in the slide, (e.order_id = d.order_id) is optional. So, even ON e.order_id = d.order_id will work.

Note: When you use the Execute Statement icon to run the query, SQL Developer suffixes a '_1' to differentiate between the two order_ids.

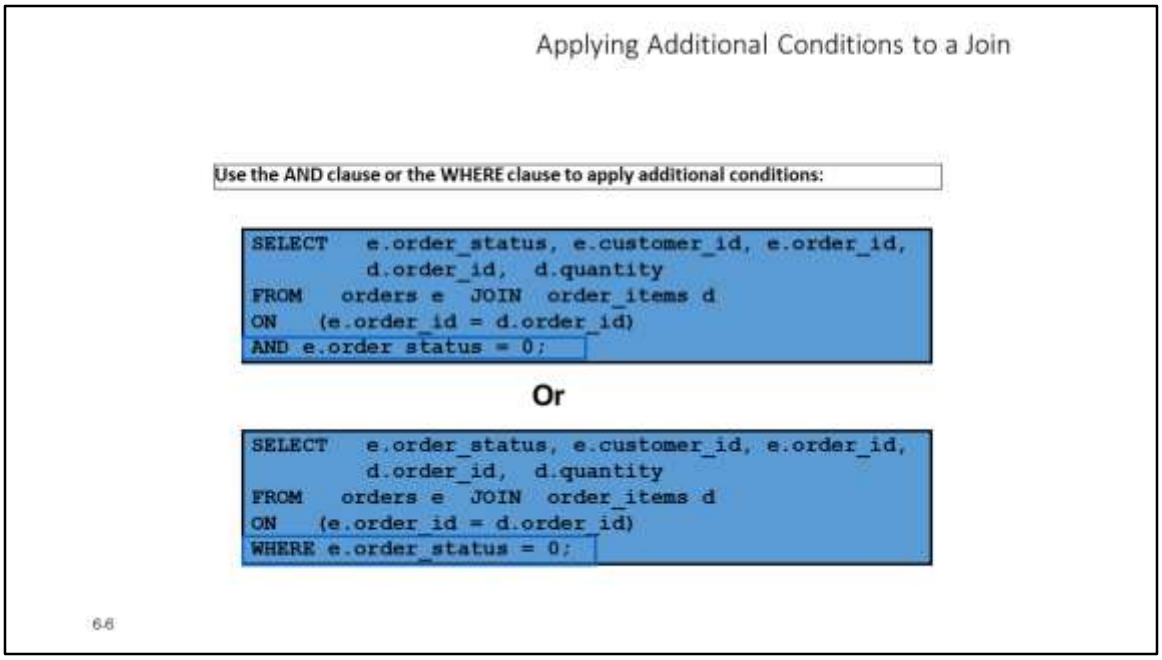


Creating Three-Way Joins with the ON Clause

A three-way join is a join of three tables. In SQL:1999–compliant syntax, joins are performed from left to right. So, the first join to be performed is ORDERS JOINS ORDER_ITEMS. The first join condition can reference columns in ORDERSS and ORDER_ITEMSS but cannot reference columns in INVENTORIES. The second join condition can reference columns from all three tables.

Note: The code example in the slide can also be accomplished with the USING clause:

```
SELECT e.customer_id, d.unit_price, f.warehouse
FROM orders e
JOIN order_items d
USING (order_id)
JOIN inventories f
USING (product_id)
```

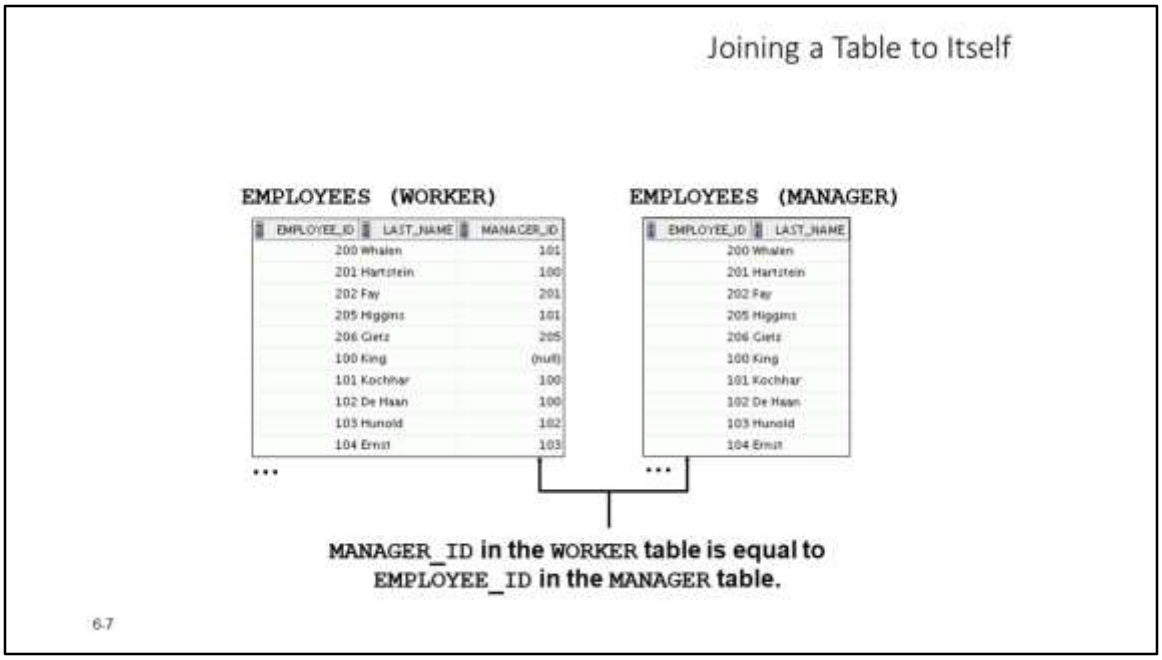


Applying Additional Conditions to a Join

You can apply additional conditions to the join.

The example shown performs a join on the `ORDERS` and `ORDER_ITEMS` tables and, in addition, displays only ORDERS which have an order status of 0. To add additional conditions to the `ON` clause, you can add `AND` clauses. Alternatively, you can use a `WHERE` clause to apply additional conditions.

	EMPLOYEE_ID	LAST_NAME	DEPARTMENT_ID	DEPARTMENT_ID_1	LOCATION_ID
1	174	Abel	80	80	2500
2	176	Taylor	80	80	2500



Joining a Table to Itself

Sometimes you need to join a table to itself. To find the name of each employee's manager, you need to join the `EMPLOYEES` table to itself, or perform a self-join. For example, to find the name of Lorentz's manager, you need to:

Find Lorentz in the `EMPLOYEES` table by looking at the `LAST_NAME` column

Find the manager number for Lorentz by looking at the `MANAGER_ID` column. Lorentz's manager number is 103.

Find the name of the manager with `EMPLOYEE_ID` 103 by looking at the `LAST_NAME` column. Hunold's employee number is 103, so Hunold is Lorentz's manager.

In this process, you look in the table twice. The first time you look in the table to find Lorentz in the `LAST_NAME` column and the `MANAGER_ID` value of 103. The second time you look in the `EMPLOYEE_ID` column to find 103 and the `LAST_NAME` column to find Hunold.