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batch -B2

Practical 5 Part II

What is a Join?

A **JOIN** combines records from two or more tables using a related column.

Types of Joins:

1. **INNER JOIN** → Returns only matching records.
2. **LEFT JOIN** → Returns all records from the left table and matching records from the right table.
3. **RIGHT JOIN** → Returns all records from the right table and matching records from the left table.
4. **FULL OUTER JOIN** → Returns all records from both tables (not available in MySQL).
5. **CROSS JOIN** → Returns the Cartesian product of both tables.
6. **SELF JOIN** → Joins a table to itself.

1. Customer Table

Column	Data Type	Constraints
customer_id	NUMBER (PK)	PRIMARY KEY, AUTO-INCREMENT
name	VARCHAR2(100)	NOT NULL
email	VARCHAR2(100)	UNIQUE

phone	VARCHAR2(15)	NOT NULL
address	VARCHAR2(255)	NULLABLE

2. Product Table

Column	Data Type	Constraints
product_id	NUMBER (PK)	PRIMARY KEY
name	VARCHAR2(100)	NOT NULL
category	VARCHAR2(50)	NOT NULL
price	DECIMAL(10,2)	NOT NULL
stock_quantity	INT	NOT NULL

3. Order_Details Table

Column	Data Type	Constraints
order_id	NUMBER (PK)	PRIMARY KEY
customer_id	NUMBER (FK)	FOREIGN KEY REFERENCES Customer(customer_id)
order_date	DATE	NOT NULL
total_amount	DECIMAL(10,2)	NOT NULL

4. Order_Item Table

Column	Data Type	Constraints

order_id	NUMBER (FK)	FOREIGN KEY REFERENCES Order_Details(order_id)
product_id	NUMBER (FK)	FOREIGN KEY REFERENCES Product(product_id)
quantity	INT	NOT NULL
subtotal	DECIMAL(10,2)	NOT NULL

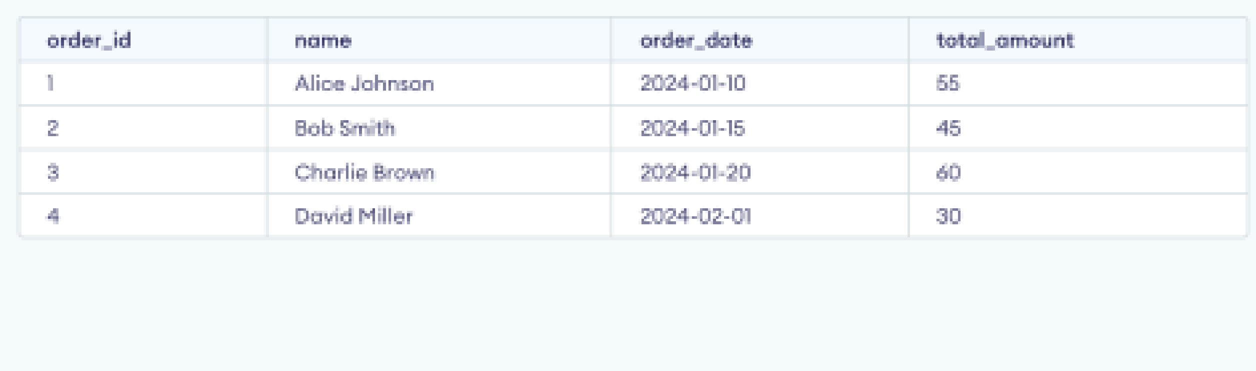
5. Employee Table

Column	Data Type	Constraints
employee_id	NUMBER (PK)	PRIMARY KEY
name	VARCHAR2(100)	NOT NULL
role	VARCHAR2(50)	NOT NULL
salary	DECIMAL(10,2)	NOT NULL
hire_date	DATE	NOT NULL

Examples of Joins

INNER JOIN: Get order details with customer names

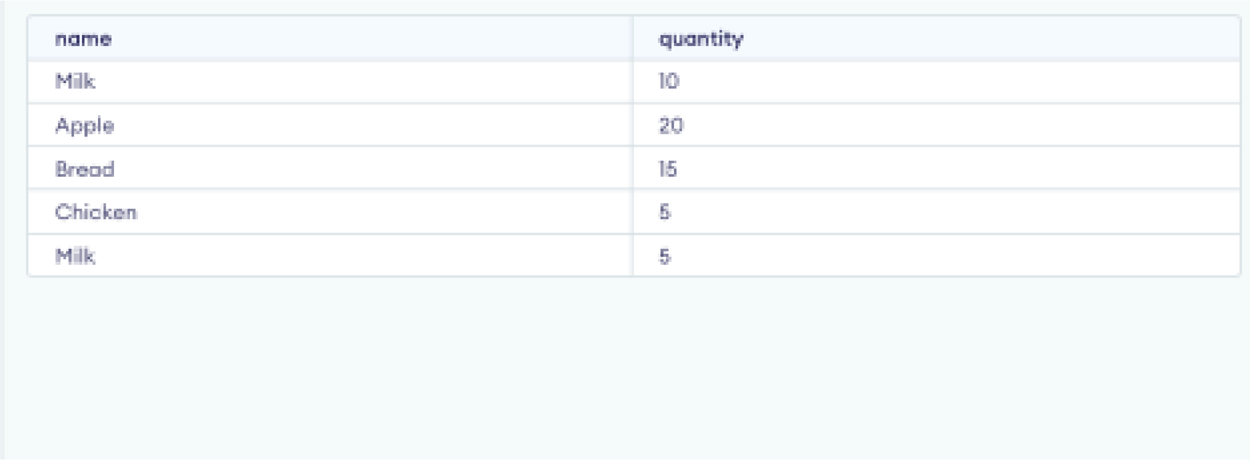
```
SELECT o.order_id, c.name, o.order_date, o.total_amount
FROM Order_Details o
INNER JOIN Customer c ON o.customer_id = c.customer_id;
```



order_id	name	order_date	total_amount
1	Alice Johnson	2024-01-10	55
2	Bob Smith	2024-01-15	45
3	Charlie Brown	2024-01-20	60
4	David Miller	2024-02-01	30

INNER JOIN: Retrieve product names and their order quantities

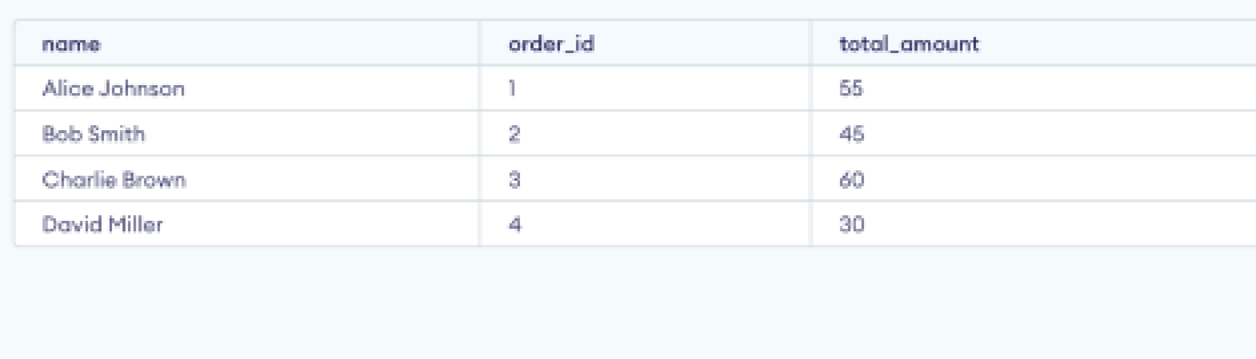
```
SELECT p.name, oi.quantity
FROM Order_Item oi
INNER JOIN Product p ON oi.product_id = p.product_id;
```



name	quantity
Milk	10
Apple	20
Bread	15
Chicken	5
Milk	5

LEFT JOIN: Get all customers and their orders (including those who never ordered)

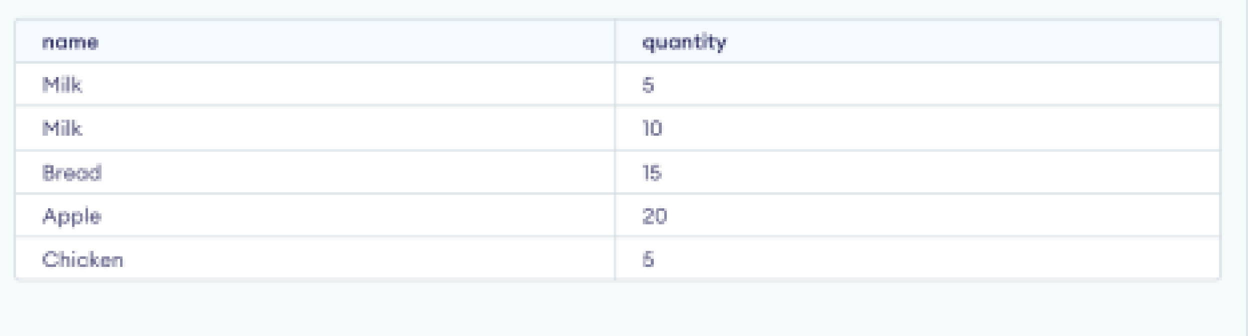
```
SELECT c.name, o.order_id, o.total_amount
FROM Customer c
LEFT JOIN Order_Details o ON c.customer_id = o.customer_id;
```



name	order_id	total_amount
Alice Johnson	1	55
Bob Smith	2	45
Charlie Brown	3	60
David Miller	4	30

LEFT JOIN: Retrieve all products and their order details (including those not ordered yet)

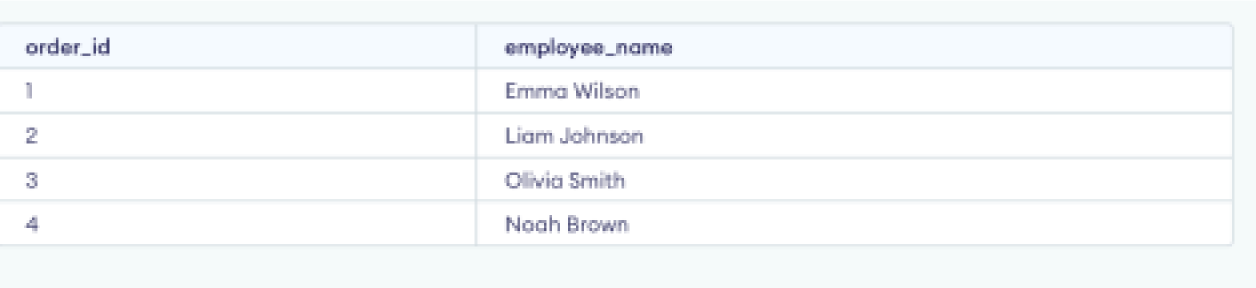
```
SELECT p.name, oi.quantity
FROM Product p
LEFT JOIN Order_Item oi ON p.product_id = oi.product_id;
```



name	quantity
Milk	5
Milk	10
Bread	15
Apple	20
Chicken	5

RIGHT JOIN: Get all orders with or without employee assigned

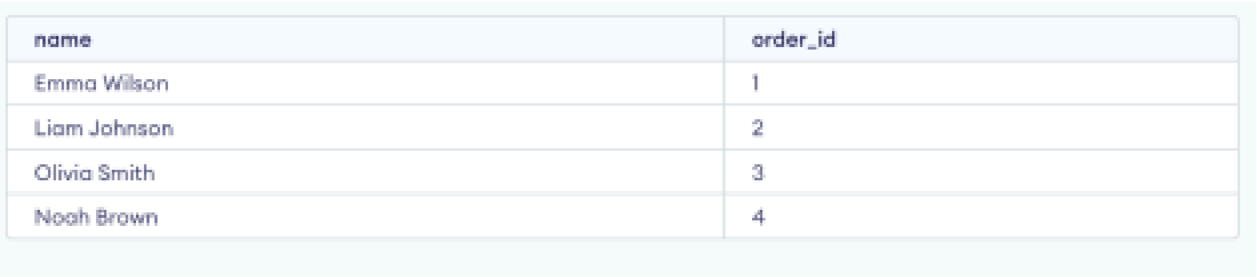
```
SELECT o.order_id, e.name AS employee_name
FROM Order_Details o
RIGHT JOIN Employee e ON o.customer_id = e.employee_id;
```



order_id	employee_name
1	Emma Wilson
2	Liam Johnson
3	Olivia Smith
4	Noah Brown

RIGHT JOIN: Retrieve employees who processed orders

```
SELECT e.name, o.order_id
FROM Employee e
RIGHT JOIN Order_Details o ON e.employee_id = o.customer_id;
```



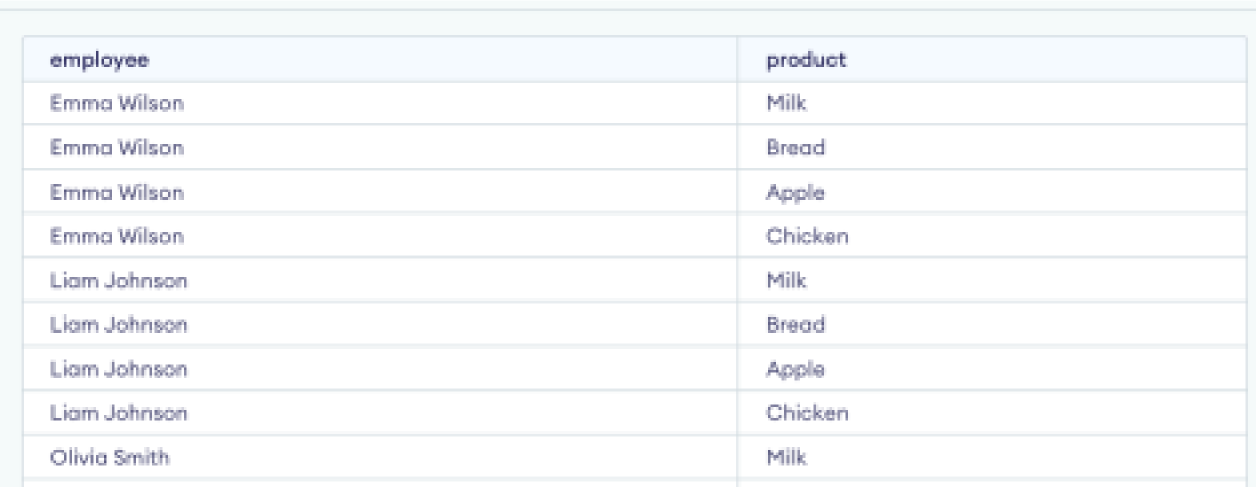
name	order_id
Emma Wilson	1
Liam Johnson	2
Olivia Smith	3
Noah Brown	4

FULL OUTER JOIN: Get all customers and orders (Oracle SQL only)

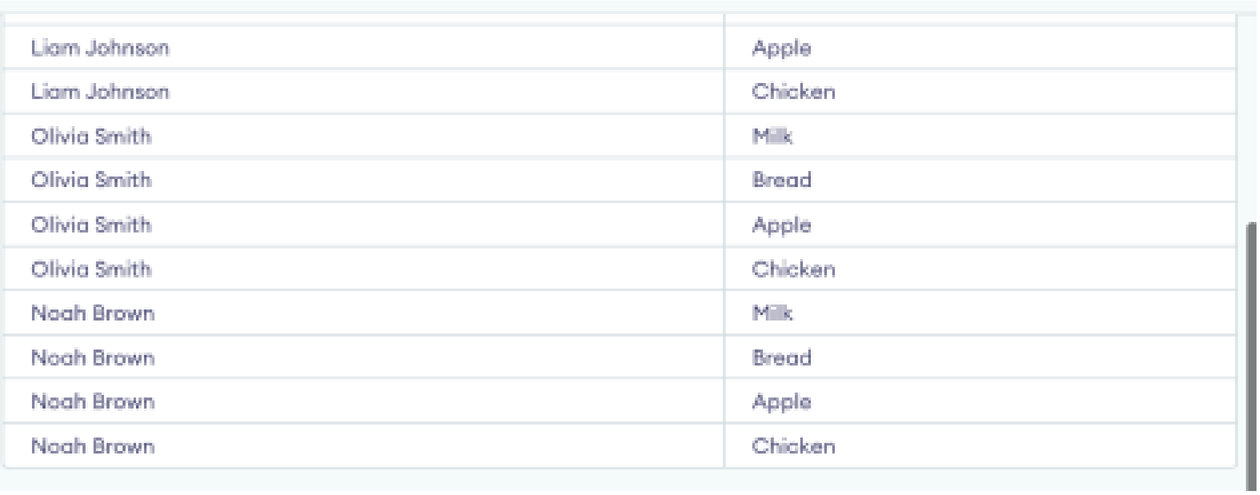
```
SELECT c.name, o.order_id, o.total_amount
FROM Customer c
FULL OUTER JOIN Order_Details o ON c.customer_id =
o.customer_id;
```

CROSS JOIN: Show all possible employee-product assignments

```
SELECT e.name AS employee, p.name AS product
FROM Employee e
CROSS JOIN Product p;
```



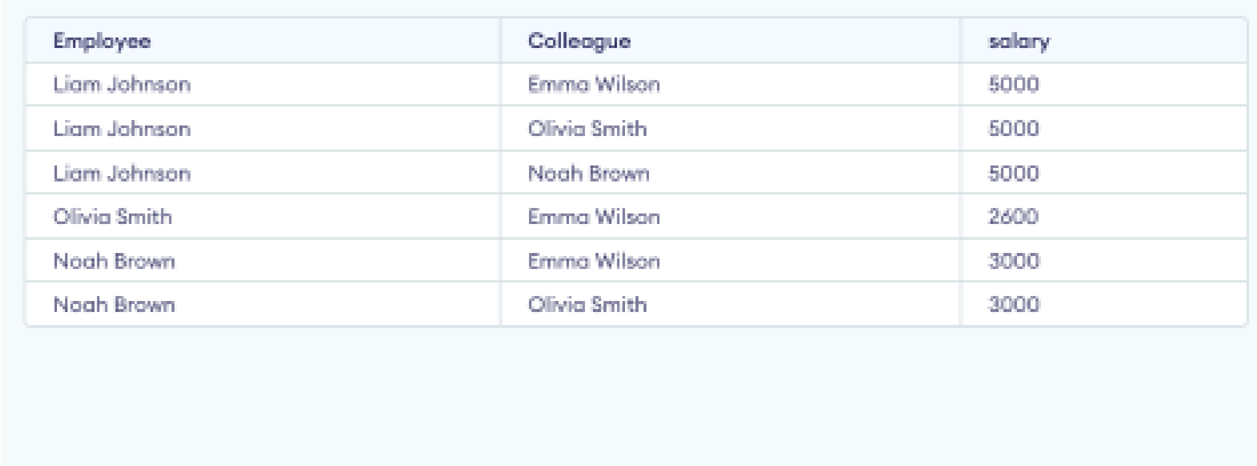
employee	product
Emma Wilson	Milk
Emma Wilson	Bread
Emma Wilson	Apple
Emma Wilson	Chicken
Liam Johnson	Milk
Liam Johnson	Bread
Liam Johnson	Apple
Liam Johnson	Chicken
Olivia Smith	Milk



Liam Johnson	Apple
Liam Johnson	Chicken
Olivia Smith	Milk
Olivia Smith	Bread
Olivia Smith	Apple
Olivia Smith	Chicken
Noah Brown	Milk
Noah Brown	Bread
Noah Brown	Apple
Noah Brown	Chicken

SELF JOIN: Find employees earning more than their colleagues

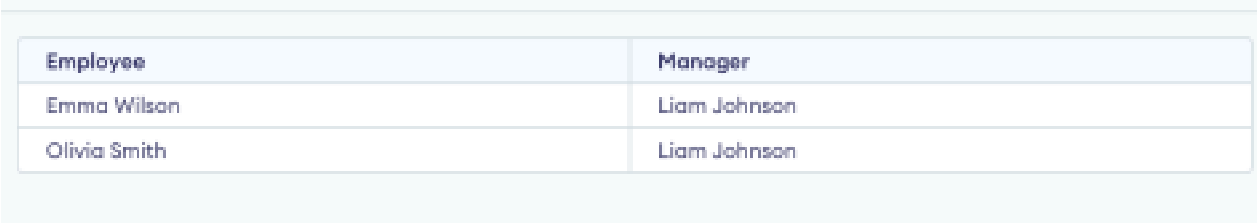
```
SELECT
e1.name AS Employee, e2.name AS Colleague, e1.salary FROM
Employee e1
JOIN Employee e2 ON e1.salary > e2.salary;
```



Employee	Colleague	salary
Liam Johnson	Emma Wilson	5000
Liam Johnson	Olivia Smith	5000
Liam Johnson	Noah Brown	5000
Olivia Smith	Emma Wilson	2600
Noah Brown	Emma Wilson	3000
Noah Brown	Olivia Smith	3000

SELF JOIN: Find employees working under the same manager

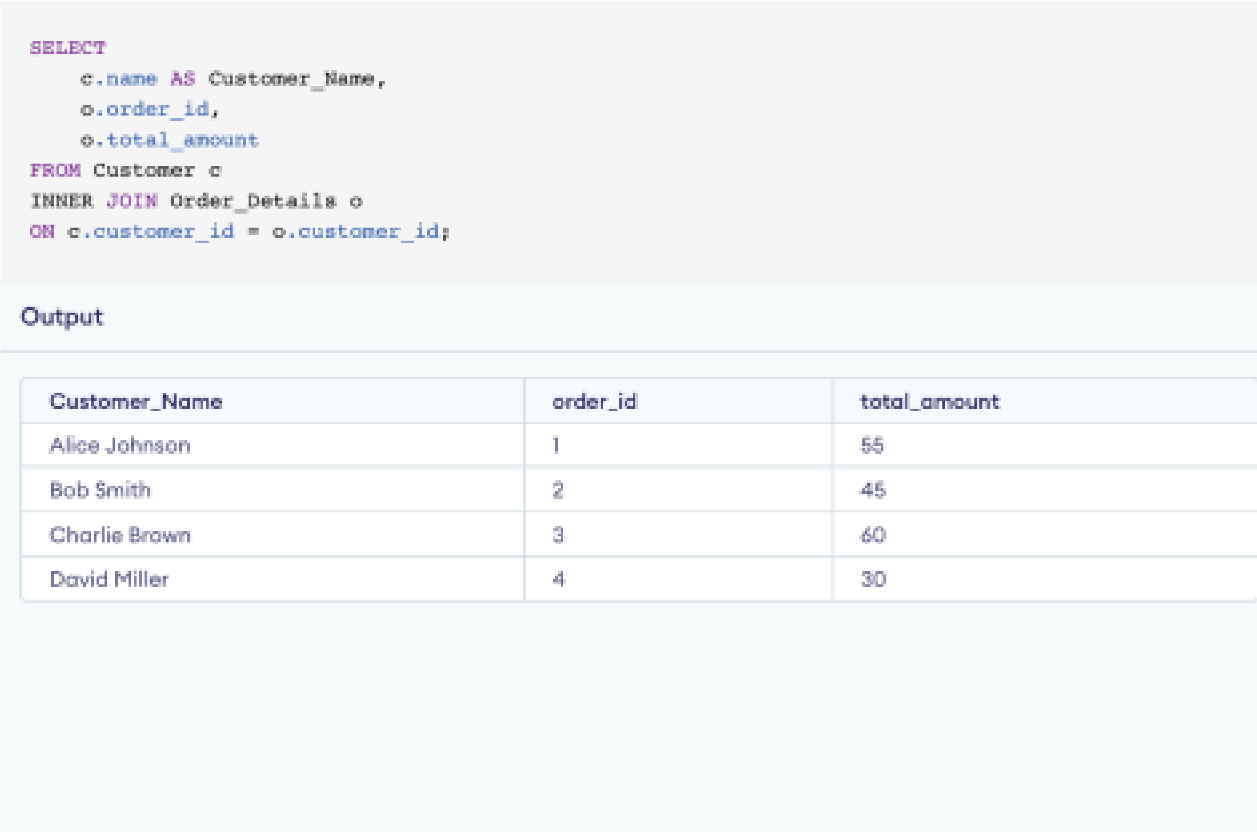
```
SELECT e1.name AS Employee, e2.name AS Manager
FROM Employee e1
JOIN Employee e2 ON e1.role = 'Cashier' AND e2.role =
 'Manager';
```



Employee	Manager
Emma Wilson	Liam Johnson
Olivia Smith	Liam Johnson

Joins Tasks

1. Retrieve **customer names** along with their orders.

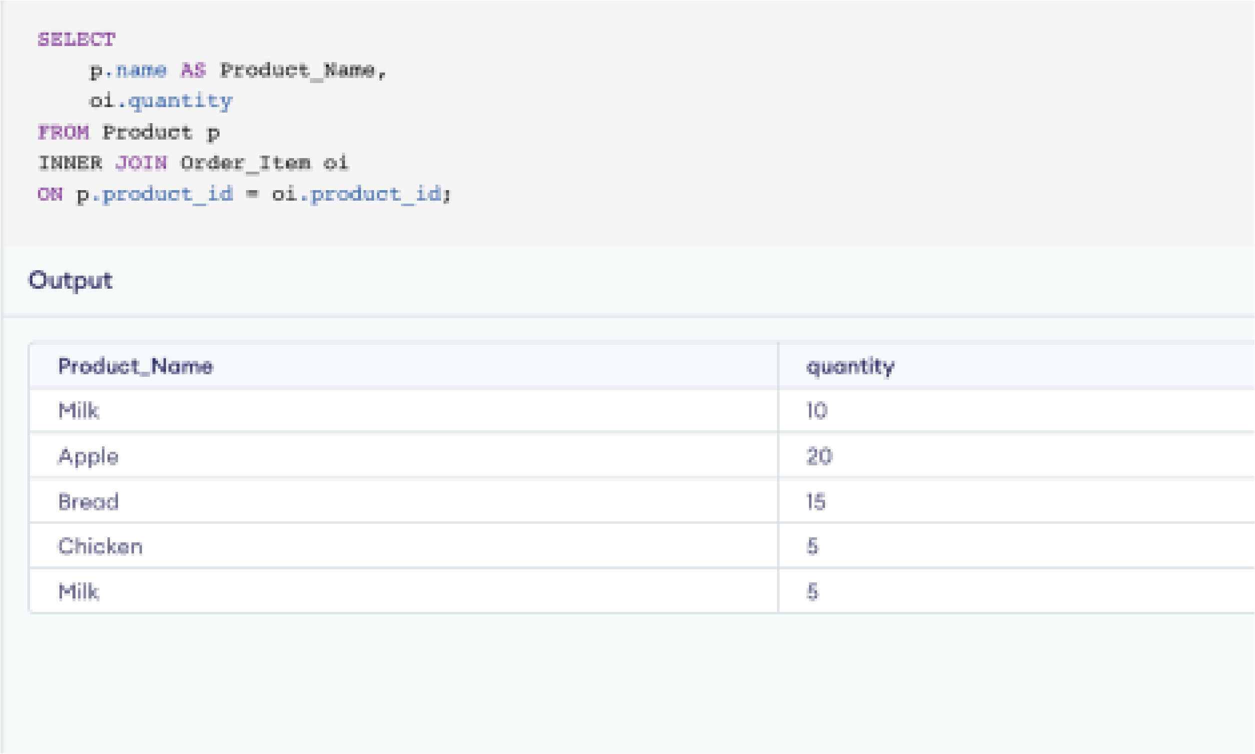


```sql
SELECT
    c.name AS Customer_Name,
    o.order_id,
    o.total_amount
FROM Customer c
INNER JOIN Order_Details o
ON c.customer_id = o.customer_id;
```

Output

Customer_Name	order_id	total_amount
Alice Johnson	1	55
Bob Smith	2	45
Charlie Brown	3	60
David Miller	4	30

2. Show **product names** and their **order quantities**.

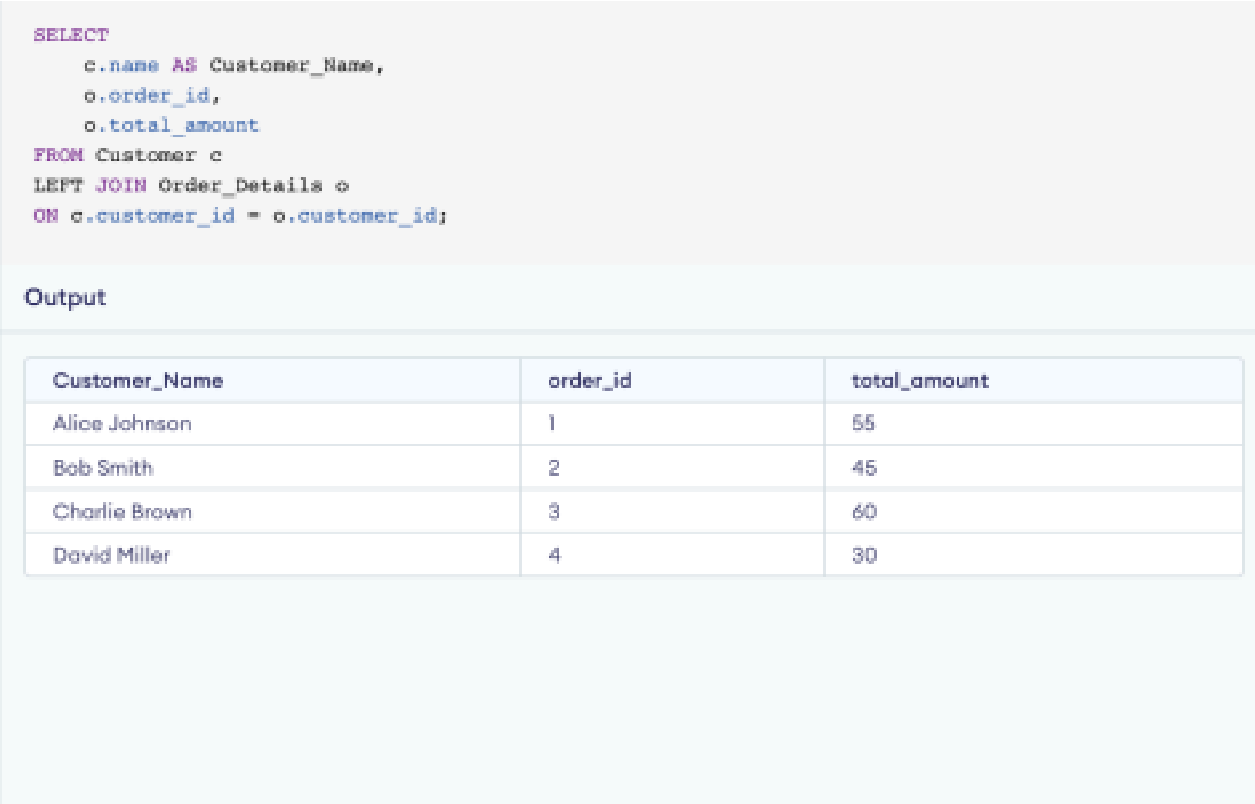


```sql
SELECT
    p.name AS Product_Name,
    oi.quantity
FROM Product p
INNER JOIN Order_Item oi
ON p.product_id = oi.product_id;
```

Output

Product_Name	quantity
Milk	10
Apple	20
Bread	15
Chicken	5
Milk	5

3. List all customers and their orders (**including those who never ordered**).

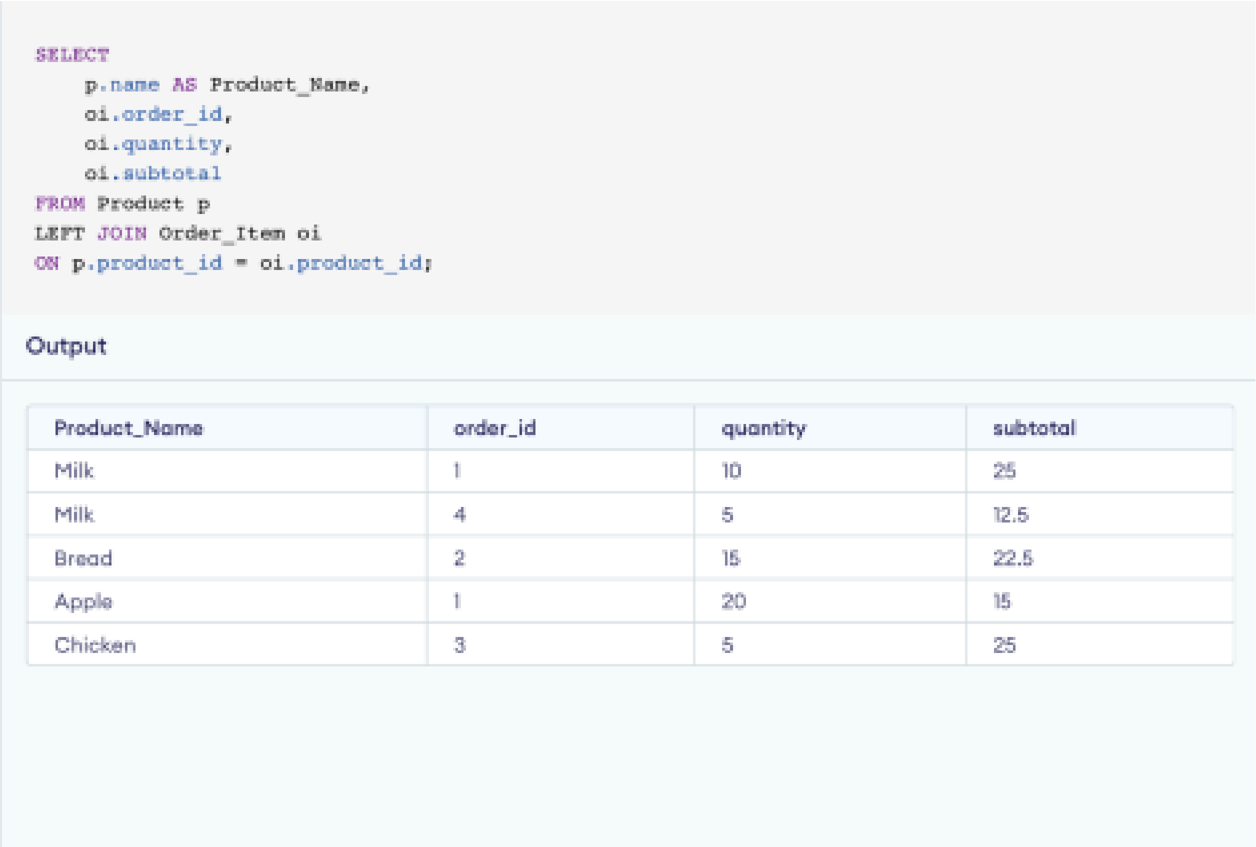


```sql
SELECT
    c.name AS Customer_Name,
    o.order_id,
    o.total_amount
FROM Customer c
LEFT JOIN Order_Details o
ON c.customer_id = o.customer_id;
```

Output

Customer_Name	order_id	total_amount
Alice Johnson	1	55
Bob Smith	2	45
Charlie Brown	3	60
David Miller	4	30

4. Retrieve **all products and their order details** (**including those not ordered yet**).

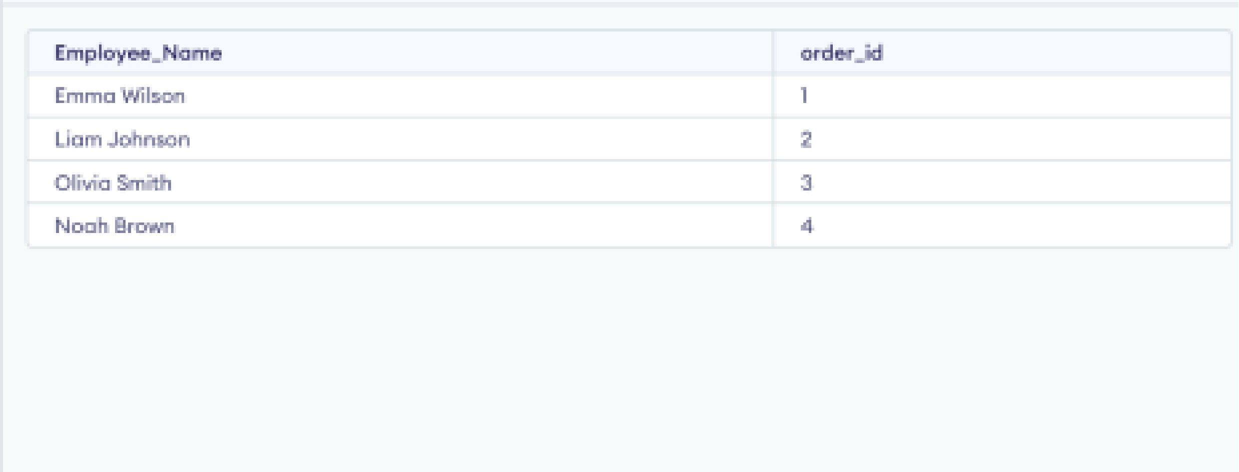


```
SELECT
    p.name AS Product_Name,
    oi.order_id,
    oi.quantity,
    oi.subtotal
FROM Product p
LEFT JOIN Order_Item oi
ON p.product_id = oi.product_id;
```

Output

Product_Name	order_id	quantity	subtotal
Milk	1	10	25
Milk	4	5	12.5
Bread	2	15	22.5
Apple	1	20	15
Chicken	3	5	25

5. Find employees who have **processed orders**.



Employee_Name	order_id
Emma Wilson	1
Liam Johnson	2
Olivia Smith	3
Noah Brown	4