SQL Joins

Step 1: Create Tables

Inventory Table

```
CREATE TABLE Inventory (
    InventoryID INT PRIMARY KEY,
    InventoryName VARCHAR(50) NOT NULL,
    InventoryDescription VARCHAR(255)
);
```

Sale Table

```
CREATE TABLE Sale (
    SaleID INT PRIMARY KEY,
    InventoryID INT NOT NULL,
    SaleDate DATE NOT NULL,
    SaleQuantity INT NOT NULL,
    SaleUnitPrice DECIMAL(10, 2) NOT NULL,
    FOREIGN KEY (InventoryID) REFERENCES
Inventory(InventoryID)
```

```
);
```

Staff Table (for Self Join)

```
CREATE TABLE Staff (
    EmployeeID INT PRIMARY KEY,
    EmployeeFirstName VARCHAR(50) NOT NULL,
    EmployeeLastName VARCHAR(50) NOT NULL,
    ManagerID INT NULL
);
```

Step 2: Insert Sample Data

Insert Data into Inventory

```
INSERT INTO Inventory VALUES
(1, 'Pen', 'Blue ballpoint pen'),
(2, 'Notebook', 'A5 ruled notebook'),
(3, 'Eraser', 'White eraser for pencils'),
(4, 'Pencil', 'HB graphite pencil'),
```

```
(5, 'Marker', 'Permanent marker');
```

Insert Data into Sale

```
INSERT INTO Sale VALUES
(101, 1, '2024-12-10', 10, 5.00),
(102, 2, '2024-12-09', 15, 3.50),
(103, 1, '2024-12-11', 5, 5.00),
(104, 4, '2024-12-08', 20, 2.00),
(105, 3, '2024-12-07', 25, 1.50);
```

Insert Data into Staff

```
INSERT INTO Staff VALUES
(1001, 'Tan', 'Mei Ling', NULL),
(1002, 'Kelvin', 'Koh', 1001),
(1003, 'Amin', 'Wong', 1002),
(1004, 'Rachel', 'Tan', 1002),
(1005, 'Siti', 'Hassan', 1001);
```

Step 3: Execute Queries

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1. Implicit Join

Query: Fetch inventory and corresponding sales.

```
SELECT *
FROM Inventory, Sale
WHERE Sale.InventoryID = Inventory.InventoryID;
```

Output:

InventoryID	Inventory Name	InventoryDescription	SaleID	SaleDate	SaleQuantity	SaleUnitPrice
1	Pen	Blue ballpoint pen	101	2024-12-10	10	5.00
2	Notebook	A5 ruled notebook	102	2024-12-09	15	3.50

Query: Calculate total sales amount for each inventory item.

```
SELECT
    InventoryName, SaleDate, SaleUnitPrice,
SaleQuantity,
    SaleQuantity * SaleUnitPrice AS [Total Amount]
FROM Sale, Inventory
WHERE Sale.InventoryID = Inventory.InventoryID
GROUP BY Sale.InventoryID, InventoryName, SaleDate,
SaleQuantity, SaleUnitPrice
ORDER BY InventoryName;
```

Output:

InventoryName	SaleDate	SaleUnitPrice	SaleQuantity	Total Amount
Notebook	2024-12-09	3.50	15	52.50
Pen	2024-12-10	5.00	10	50.00

---

2. Inner Join

Query: Fetch inventory and corresponding sales.

```
SELECT *
FROM Inventory
INNER JOIN Sale
ON Sale.InventoryID = Inventory.InventoryID;
```

Output:

InventoryID	Inventory Name	InventoryDescription	SaleID	SaleDate	SaleQuantity	SaleUnitPrice
1	Pen	Blue ballpoint pen	101	2024-12-10	10	5.00
3	Eraser	White eraser	105	2024-12-07	25	1.50

Query: Calculate total sales amount for each inventory item.

```
SELECT
    InventoryName, SaleDate, SaleUnitPrice,
SaleQuantity,
    SaleUnitPrice * SaleQuantity AS [Total Amount]
FROM Inventory
```

```
INNER JOIN Sale
ON Sale.InventoryID = Inventory.InventoryID
ORDER BY InventoryName;
```

Output:

InventoryName	SaleDate	SaleUnitPrice	SaleQuantity	Total Amount
Eraser	2024-12-07	1.50	25	37.50
Pen	2024-12-10	5.00	10	50.00

---

3. Full Outer Join

Query: Show all inventories and their sales, including those without matches.

```
SELECT Sale.InventoryID, InventoryName
FROM Inventory
FULL OUTER JOIN Sale
ON Sale.InventoryID = Inventory.InventoryID
```

```
WHERE Sale.InventoryID IS NULL;
```

Output:

InventoryID	InventoryName
5	Marker

---

4. Self Join

Query: Show employees and their managers.

```
SELECT E.EmployeeID,
       E.EmployeeFirstName + ' ' + E.EmployeeLastName
AS [Full Name],
       E.ManagerID,
       M.EmployeeFirstName + ' ' + M.EmployeeLastName
AS [Manager Name]
FROM Staff E
INNER JOIN Staff M
ON E.ManagerID = M.EmployeeID;
```

Output:

Employee ID	Full Name	ManagerID	Manager Name
1002	Kelvin Koh	1001	Tan Mei Ling
1003	Amin Wong	1002	Kelvin Koh
