**2.DATABASE DESIGN, DATA DICTIONARY, QUERY LANGUAGE.**

**A) SCHEMA DESIGN:**

1. MACHINE (Strong Entity):

a. id (Primary Key)

b. identifier (String)

c. capacity (INT)

d. worker\_id (Foreign Key)

2. MAINTENANCE (Weak Entity):

a. maintenance\_id (Primary Key)

b. maintenance\_date (Date)

c. maintenance\_cost (Int)

d. machine\_id (Foreign Key)

3. WORKER (Strong Entity):

a. id (Primary Key)

b. aadhar\_no (String)

c. gender(String)

d. age (Int)

e. name (String)

f. address (Multivalued Attribute)

4. PRODUCE (Strong Entity):

a. produced\_id (Primary Key)

b. identifer (String)

c. production\_date (Date)

d. amount (Int)

e. rate (Int)

f. quantity (Int)

g. worker\_id (Foreign Key)

5. INVENTORY (Strong Entity):

a. identifier (Primary Key)

b. quantity (Int)

c. rate (Int)

6. ORDER (Strong Entity):

a. BILL\_NUMBER (Primary Key)

b. amount (Int)

c. identifier (String) (FK)

d. isPaymentDone (Boolean)

e. order\_date (Timestamps)

g. customer\_id (Foreign Key)

7. CUSTOMER (Strong Entity):

a. id (Primary Key)

b. gstin (Varchar)

c. address\_id (Foreign Key)

d. name (String)

8. MATERIAL (Strong Entity):

a. id (Primary Key)

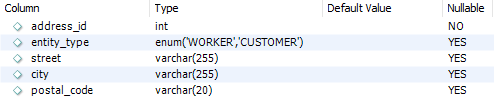
b. date (Date)

c. rate (Int)

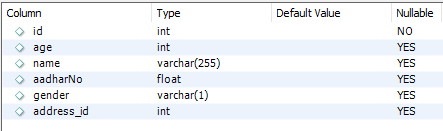
d. quantity (Int)

**B) DATA DICTIONARY:**

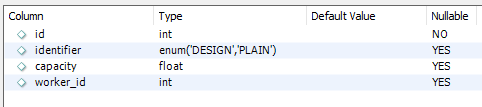
Address:



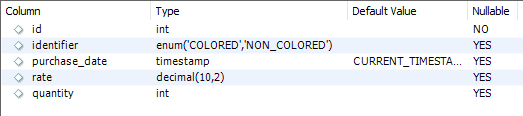
Worker:



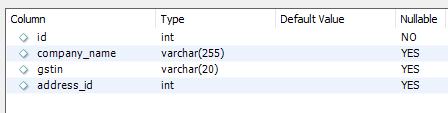
Machine:



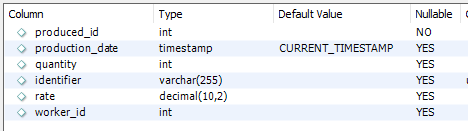
Material:



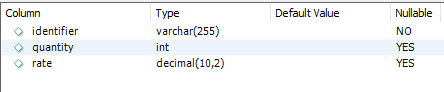
Customer:



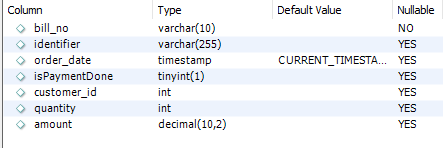
Produced:

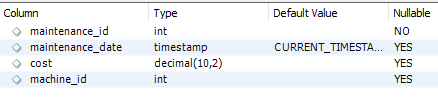


Inventory:

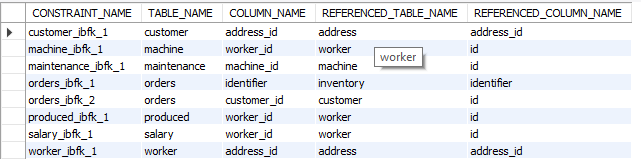


Orders:



Maintenance:

Foreign Keys:



**C) DATA DEFINITION LANGUAGE:**

**DDL:**

CREATE TABLE Address (

    address\_id INT AUTO\_INCREMENT PRIMARY KEY,

    entity\_type ENUM('WORKER', 'CUSTOMER'),

    street VARCHAR(255),

    city VARCHAR(255),

    postal\_code VARCHAR(20)

);

CREATE TABLE Worker (

    id INT AUTO\_INCREMENT PRIMARY KEY,

    age INT,

    name VARCHAR(255),

    aadharNo FLOAT,

    gender VARCHAR(1),

    address\_id INT,

    FOREIGN KEY (address\_id) REFERENCES Address(address\_id)

);

CREATE TABLE Machine (

    id INT AUTO\_INCREMENT PRIMARY KEY,

    identifier ENUM('DESIGN', 'PLAIN'),

    capacity FLOAT,

    worker\_id INT,

    FOREIGN KEY (worker\_id) REFERENCES Worker(id) ON DELETE SET NULL

);

CREATE TABLE Maintenance (

    maintenance\_id INT AUTO\_INCREMENT PRIMARY KEY,

    maintenance\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

    cost DECIMAL(10,2),

    machine\_id INT,

    FOREIGN KEY (machine\_id) REFERENCES Machine(id)

);

CREATE TABLE Produced (

    produced\_id INT AUTO\_INCREMENT PRIMARY KEY,

    production\_date DATE,

    quantity INT,

    identifier VARCHAR(255),

    rate DECIMAL(10,2),

    worker\_id INT,

    FOREIGN KEY (worker\_id) REFERENCES Worker(id)

);

CREATE TABLE Inventory (

    identifier VARCHAR(255) PRIMARY KEY,

    quantity INT,

    rate DECIMAL(10,2)

);

CREATE TABLE Customer (

    id INT AUTO\_INCREMENT PRIMARY KEY,

    company\_name VARCHAR(255),

    gstin VARCHAR(20),

    address\_id INT,

    shipping\_address\_id INT,

    FOREIGN KEY (address\_id) REFERENCES Address(address\_id)

);

CREATE TABLE Orders (

    bill\_no VARCHAR(10) PRIMARY KEY,

    identifier VARCHAR(255),

    order\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

    isPaymentDone BOOLEAN,

    customer\_id INT,

    quantity INT,

    amount DECIMAL(10,2),

    inventory\_type VARCHAR(255),

    FOREIGN KEY (identifier) REFERENCES Inventory(identifier),

    FOREIGN KEY (customer\_id) REFERENCES Customer(id)

);

CREATE TABLE Material (

    id INT AUTO\_INCREMENT PRIMARY KEY,

    identifier ENUM('COLORED', 'NON\_COLORED'),

    purchase\_date DATE,

    rate DECIMAL(10,2),

    quantity INT

);

**D) QUERIES:**

1) -- Show all workers' details.

SELECT \* FROM Worker;

2) -- Display all customers' information.

SELECT \* FROM Customer;

3) -- List all machines with their capacities.

SELECT id, identifier, capacity FROM Machine;

4) -- Show all maintenance records.

SELECT \* FROM Maintenance;

5) -- Display all produced items with their production dates.

SELECT \* FROM Produced;

6) -- List all inventory items.

SELECT \* FROM Inventory;

7) -- Show all orders placed.

SELECT \* FROM Orders;

8) -- List all material purchases.

SELECT \* FROM Material;

9) -- Show all workers who are older than 25 years.

SELECT \* FROM Worker WHERE age > 25;

10) -- Display all customers whose company name starts with 'A'.

SELECT \* FROM Customer WHERE company\_name LIKE 'A%';

11) -- List all machines with a capacity greater than or equal to 150 meters.

SELECT \* FROM Machine WHERE capacity >= 150;

12) -- Show all maintenance records with a cost less than 100.

SELECT \* FROM Maintenance WHERE cost < 100;

13) -- Display all produced items with a quantity greater than 50.

SELECT \* FROM Produced WHERE quantity > 50;

14) -- List all inventory items with a rate greater than 5.

SELECT \* FROM Inventory WHERE rate > 5;

15) -- Show all orders where payment is not done.

SELECT \* FROM Orders WHERE isPaymentDone = FALSE;

16) -- List all workers who are male and older than 30 years.

SELECT \* FROM Worker WHERE gender = 'M' AND age > 30;

17) -- Display all customers whose company name starts with 'A' or 'B'.

SELECT \* FROM Customer WHERE company\_name LIKE 'A%' OR company\_name LIKE 'B%';

18) -- Show all machines with a capacity greater than 200 or assigned to worker ID 2.

SELECT \* FROM Machine WHERE capacity > 200 OR worker\_id = 2;

19) -- Display all maintenance records with a cost less than 50 or done for machine ID 1.

SELECT \* FROM Maintenance WHERE cost < 50 OR machine\_id = 1;

20) -- List all produced items with a quantity greater than 100 and produced by worker ID 1.

SELECT \* FROM Produced WHERE quantity > 100 AND worker\_id = 1;

21) -- Show all inventory items with a rate greater than 10 and a quantity less than 200.

SELECT \* FROM Inventory WHERE rate > 10 AND quantity < 200;

22) -- Display all orders where payment is not done and the amount is greater than 1000.

SELECT \* FROM Orders WHERE isPaymentDone = FALSE AND amount > 1000;

23) -- List all workers who are older than 25 years or have an Aadhar number.

SELECT \* FROM Worker WHERE age > 25 OR aadharNo IS NOT NULL;

24) -- Show the total number of workers.

SELECT COUNT(\*) AS total\_workers FROM Worker;

25) -- Show the total number of customers.

SELECT COUNT(\*) AS total\_customers FROM Customer;

26) -- Show the total number of machines.

SELECT COUNT(\*) AS total\_machines FROM Machine;

27) -- Show the total number of maintenance records.

SELECT COUNT(\*) AS total\_maintenance FROM Maintenance;

28) -- Show the total number of produced items.

SELECT COUNT(\*) AS total\_produced FROM Produced;

29) -- Show the total number of inventory items.

SELECT COUNT(\*) AS total\_inventory FROM Inventory;

30) -- Show the total number of orders.

SELECT COUNT(\*) AS total\_orders FROM Orders;

31) -- Show the total number of material purchases.

SELECT COUNT(\*) AS total\_material FROM Material;

32) -- Display the average age of workers.

SELECT AVG(age) AS average\_age FROM Worker;

33) -- Display the total cost of maintenance.

SELECT SUM(cost) AS total\_maintenance\_cost FROM Maintenance;

34) -- Show the total quantity of produced items.

SELECT SUM(quantity) AS total\_produced\_quantity FROM Produced;

35) -- Show the total quantity of inventory items.

SELECT SUM(quantity) AS total\_inventory\_quantity FROM Inventory;

36) -- Show the total amount of orders.

SELECT SUM(amount) AS total\_orders\_amount FROM Orders;

37) -- Show the total quantity of material purchases.

SELECT SUM(quantity) AS total\_material\_quantity FROM Material;

38) -- Display the workers along with their addresses.

SELECT Worker.\*, Address.street, Address.city, Address.postal\_code

FROM Worker

INNER JOIN Address ON Worker.address\_id = Address.address\_id;

39) -- Display the customers along with their addresses.

SELECT Customer.\*, Address.street, Address.city, Address.postal\_code

FROM Customer

INNER JOIN Address ON Customer.address\_id = Address.address\_id;

40) -- Show the machines along with the workers assigned to them.

SELECT Machine.\*, Worker.name AS worker\_name

FROM Machine

LEFT JOIN Worker ON Machine.worker\_id = Worker.id;

41) -- Show the orders along with the customer details.

SELECT Orders.\*, Customer.company\_name, Customer.gstin

FROM Orders

INNER JOIN Customer ON Orders.customer\_id = Customer.id;

42) -- Show the produced items along with the worker details.

SELECT Produced.\*, Worker.name AS worker\_name

FROM Produced

INNER JOIN Worker ON Produced.worker\_id = Worker.id;

43) -- Show the maintenance records along with the machine details.

SELECT Maintenance.\*, Machine.identifier

FROM Maintenance

INNER JOIN Machine ON Maintenance.machine\_id = Machine.id;

44) -- Show the material purchases along with their types.

SELECT Material.\*, CASE WHEN identifier = 'COLORED' THEN 'Colored' ELSE 'Non-Colored' END AS type

FROM Material;

45) -- Display the orders along with the inventory items.

SELECT Orders.\*, Inventory.\*

FROM Orders

INNER JOIN Inventory ON Orders.identifier = Inventory.identifier;

46) -- Show the total quantity produced by each worker.

SELECT Worker.id, Worker.name, SUM(Produced.quantity) AS total\_quantity\_produced

FROM Worker

LEFT JOIN Produced ON Worker.id = Produced.worker\_id

GROUP BY Worker.id, Worker.name;

47) -- Show the total cost of maintenance for each machine type.

SELECT Machine.identifier, SUM(Maintenance.cost) AS total\_maintenance\_cost

FROM Machine

LEFT JOIN Maintenance ON Machine.id = Maintenance.machine\_id

GROUP BY Machine.identifier;

48) -- Show the total quantity of inventory items for each type.

SELECT identifier, SUM(quantity) AS total\_quantity

FROM Inventory

GROUP BY identifier;

49) -- Show the total amount of orders for each customer.

SELECT Customer.id, Customer.company\_name, SUM(Orders.amount) AS total\_order\_amount

FROM Customer

LEFT JOIN Orders ON Customer.id = Orders.customer\_id

GROUP BY Customer.id, Customer.company\_name;

50) -- Show the total quantity produced for each type of identifier.

SELECT identifier, SUM(quantity) AS total\_quantity\_produced

FROM Produced

GROUP BY identifier;

51) -- Show the average age of workers grouped by gender.

SELECT gender, AVG(age) AS average\_age

FROM Worker

GROUP BY gender;

52) -- Show the total quantity of material purchases for each type of identifier.

SELECT identifier, SUM(quantity) AS total\_quantity

FROM Material

GROUP BY identifier;

53) -- Show the average rate of material purchases for each type of identifier.

SELECT identifier, AVG(rate) AS average\_rate

FROM Material

GROUP BY identifier;

54) -- Show the total number of orders placed by each customer.

SELECT customer\_id, COUNT(\*) AS total\_orders

FROM Orders

GROUP BY customer\_id;

55) --Show the Address Details by Entity Type and Entity ID.

SELECT \* FROM Address WHERE entity\_type = ? AND entity\_id = ?;

56) --Show the Machines Assigned to Workers Older Than a Specified Age.

SELECT \* FROM Machine WHERE worker\_id IN (SELECT id FROM Worker WHERE age > ?);

57) --Show the Maintenance Records for Machines with Capacities Greater Than a Given Value.

SELECT \* FROM Maintenance WHERE machine\_id IN (SELECT id FROM Machine WHERE capacity > ?);

58) --Show the Produced Items by Worker ID and Production Date Range.

SELECT \* FROM Produced WHERE worker\_id = ? AND production\_date BETWEEN ? AND ?;

59) --Show the Orders Placed by Customers with Company Names Starting with a Specific Letter.

SELECT \* FROM Orders WHERE customer\_id IN (SELECT id FROM Customer WHERE company\_name LIKE ?);

60) --Show the Material Purchases by Purchase Date and Quantity Range.

SELECT \* FROM Material WHERE purchase\_date BETWEEN ? AND ? AND quantity BETWEEN ? AND ?;

61) --Show the Maintenance Records for Machines with Capacities in a Specified Range.

SELECT \* FROM Maintenance WHERE machine\_id IN (SELECT id FROM Machine WHERE capacity BETWEEN ? AND ?);

62) --Show the Produced Items by Production Date and Quantity Range.

SELECT \* FROM Produced WHERE production\_date = ? AND quantity BETWEEN ? AND ?;

63) --Show the Orders with Payment Status and Amount Range.

SELECT \* FROM Orders WHERE isPaymentDone = ? AND amount BETWEEN ? AND ?;

64) --Show the Material Purchases by Purchase Date and Rate Range.

SELECT \* FROM Material WHERE purchase\_date BETWEEN ? AND ? AND rate BETWEEN ? AND ?;

65) --Show the Workers by Age and Gender.

SELECT \* FROM Worker WHERE age > ? AND gender = ?;

66) --Show the Customers by City and Postal Code.

SELECT \* FROM Customer WHERE address\_id IN (SELECT address\_id FROM Address WHERE city = ? AND postal\_code = ?);

67) --Show the Maintenance Records for Machines with Capacities Greater Than a Given Value and Maintenance Cost in a Specified Range.

SELECT \* FROM Maintenance WHERE machine\_id IN (SELECT id FROM Machine WHERE capacity > ?) AND cost BETWEEN ? AND ?;

68) --Show the Material Purchases by Identifier and Purchase Date Range.

SELECT \* FROM Material WHERE identifier = ? AND purchase\_date BETWEEN ? AND ?;

69) --Show the Produced Items by Worker ID and Quantity Range.

SELECT \* FROM Produced WHERE worker\_id = ? AND quantity BETWEEN ? AND ?;

70) --Show the Machines with Capacities Greater Than or Equal to a Given Value and Assigned to Workers Younger Than a Specified Age.

SELECT \* FROM Machine WHERE capacity >= ? AND worker\_id IN (SELECT id FROM Worker WHERE age < ?);

71) --Show the Maintenance Records for Machines with Capacities Less Than a Given Value and Maintenance Cost in a Specified Range.

SELECT \* FROM Maintenance WHERE machine\_id IN (SELECT id FROM Machine WHERE capacity < ?) AND cost BETWEEN ? AND ?;

72) --Show the Produced Items by Production Date Range and Quantity.

SELECT \* FROM Produced WHERE production\_date BETWEEN ? AND ? AND quantity = ?;

73) --Show the Orders Placed by Customers with a Specific GSTIN.

SELECT \* FROM Orders WHERE customer\_id IN (SELECT id FROM Customer WHERE gstin = ?);

74) --Show the Material Purchases by Identifier and Quantity Range.

SELECT \* FROM Material WHERE identifier = ? AND quantity BETWEEN ? AND ?;

75) --Show the Workers by Age Range and Address City.

SELECT \* FROM Worker WHERE age BETWEEN ? AND ? AND address\_id IN (SELECT address\_id FROM Address WHERE city = ?);

76) --Show the Customers by Company Name and Shipping Address City.

SELECT \* FROM Customer WHERE company\_name = ? AND shipping\_address\_id IN (SELECT address\_id FROM Address WHERE city = ?);

77) --Show the Orders with Payment Status and Amount Greater Than a Specified Value.

SELECT \* FROM Orders WHERE isPaymentDone = ? AND amount > ?;

78) --Show the Material Purchases by Purchase Date and Identifier.

SELECT \* FROM Material WHERE purchase\_date = ? AND identifier = ?;

79) --Show the Workers by Gender and Postal Code.

SELECT \* FROM Worker WHERE gender = ? AND address\_id IN (SELECT address\_id FROM Address WHERE postal\_code = ?);

80) --Show the Customers by City and Entity Type.

SELECT \* FROM Customer WHERE address\_id IN (SELECT address\_id FROM Address WHERE city = ?) AND entity\_type = ?;

81) --Show the Maintenance Records for Machines with Capacities in a Range and Maintenance Date Range.

SELECT \* FROM Maintenance WHERE machine\_id IN (SELECT id FROM Machine WHERE capacity BETWEEN ? AND ?) AND maintenance\_date BETWEEN ? AND ?;

82) --Show the Produced Items by Production Date Range and Worker ID.

SELECT \* FROM Produced WHERE production\_date BETWEEN ? AND ? AND worker\_id = ?;

83) --Show the Orders by Customer and Order Date Range.

SELECT \* FROM Orders WHERE customer\_id = ? AND order\_date BETWEEN ? AND ?;

84) --Show the Workers by Gender and Entity Type.

SELECT \* FROM Worker WHERE gender = ? AND entity\_type = ?;

85) --Show the Maintenance Records for Machines with Capacities in a Range and Maintenance Cost in a Range.

SELECT \* FROM Maintenance WHERE machine\_id IN (SELECT id FROM Machine WHERE capacity BETWEEN ? AND ?) AND cost BETWEEN ? AND ?;

86) --Show the Produced Items by Production Date and Identifier.

SELECT \* FROM Produced WHERE production\_date = ? AND identifier = ?;

87) --Show the Orders by Amount Range and Inventory Type.

SELECT \* FROM Orders WHERE amount BETWEEN ? AND ? AND inventory\_type = ?;

88) --Show the Maintenance Records for Machines with Capacities Less Than or Equal to a Given Value and Maintenance Cost Greater Than a Specified Amount.

SELECT \* FROM Maintenance WHERE machine\_id IN (SELECT id FROM Machine WHERE capacity <= ?) AND cost > ?;

89) --Show the Produced Items by Production Date Range and Identifier.

SELECT \* FROM Produced WHERE production\_date BETWEEN ? AND ? AND identifier = ?;

90) -- Show the total quantity of inventory items produced by each worker.

SELECT Worker.id, Worker.name, SUM(Produced.quantity) AS total\_quantity\_produced

FROM Worker

LEFT JOIN Produced ON Worker.id = Produced.worker\_id

GROUP BY Worker.id, Worker.name;

91) -- Show the total amount of orders placed for each type of identifier.

SELECT identifier, SUM(amount) AS total\_amount

FROM Orders

GROUP BY identifier;

92) -- Show the total quantity of material purchases for each month.

SELECT MONTH(purchase\_date) AS month, SUM(quantity) AS total\_quantity

FROM Material

GROUP BY MONTH(purchase\_date);

93) -- Show the total amount of orders placed for each month.

SELECT MONTH(order\_date) AS month, SUM(amount) AS total\_amount

FROM Orders

GROUP BY MONTH(order\_date);

**D) QUERIES:**

-- Update Worker's Age:

UPDATE Worker

SET age = 40

WHERE id = 1;

-- Update Maintenance Cost:

UPDATE Maintenance

SET cost = cost \* 1.1

WHERE maintenance\_date < '2024-01-01';

-- Insert New Machine:

INSERT INTO Machine (identifier, capacity, worker\_id)

VALUES ('EMBROIDERY', 200, 3);

-- Delete Worker:

DELETE FROM Worker

WHERE id = 5;

-- Update Customer's Shipping Address:

UPDATE Customer

SET shipping\_address\_id = 2

WHERE id = 1;

-- Insert New Inventory Item:

INSERT INTO Inventory (identifier, quantity, rate)

VALUES ('SILK', 100, 25.50);

-- Update Order Quantity:

UPDATE Orders

SET quantity = quantity + 10

WHERE bill\_no = 'ORD123';

-- Update Production Rate:

UPDATE Produced

SET rate = rate \* 1.05

WHERE production\_date BETWEEN '2023-01-01' AND '2023-12-31';

-- Insert New Customer:

INSERT INTO Customer (company\_name, gstin, address\_id)

VALUES ('ABC Textiles', 'GST123456789', 4);

-- Delete Maintenance Record:

DELETE FROM Maintenance

WHERE maintenance\_id = 10;

-- Update Material Quantity:

UPDATE Material

SET quantity = quantity - 50

WHERE identifier = 'COLORED';

-- Insert New Maintenance Record:

INSERT INTO Maintenance (maintenance\_date, cost, machine\_id)

VALUES ('2024-03-15', 500.00, 3);

-- Update Order Payment Status:

UPDATE Orders

SET isPaymentDone = TRUE

WHERE bill\_no = 'ORD456';

-- Insert New Worker:

INSERT INTO Worker (age, name, aadharNo, gender, address\_id)

VALUES (35, 'John Doe', 1234567890, 'M', 6);

-- Update Customer's Company Name:

UPDATE Customer

SET company\_name = 'XYZ Fabrics'

WHERE id = 2;

-- Delete Machine:

DELETE FROM Machine

WHERE id = 5;

Update Produced Quantity:

-- UPDATE Produced

SET quantity = quantity - 20

WHERE production\_date < '2023-01-01';

-- Insert New Material:

INSERT INTO Material (identifier, purchase\_date, rate, quantity)

VALUES ('NON\_COLORED', '2024-04-01', 30.00, 500);

-- Update Customer's GSTIN:

UPDATE Customer

SET gstin = 'GST987654321'

WHERE id = 3;

-- Delete Inventory Item:

DELETE FROM Inventory

WHERE identifier = 'COTTON';

-- Average Worker Age:

SELECT AVG(age) AS avg\_age

FROM Worker;

-- Total Maintenance Cost:

SELECT SUM(cost) AS total\_cost

FROM Maintenance;

-- Count of Machines by Worker Gender:

SELECT w.gender, COUNT(m.id) AS machine\_count

FROM Worker w

LEFT JOIN Machine m ON w.id = m.worker\_id

GROUP BY w.gender;

-- Maximum Production Rate by Machine Type:

SELECT m.identifier, MAX(p.rate) AS max\_rate

FROM Machine m

LEFT JOIN Produced p ON m.id = p.machine\_id

GROUP BY m.identifier;

-- Average Order Amount by Customer:

SELECT c.company\_name, AVG(o.amount) AS avg\_order\_amount

FROM Customer c

JOIN Orders o ON c.id = o.customer\_id

GROUP BY c.company\_name;

-- List of Machines with Total Capacity:

SELECT m.identifier, SUM(m.capacity) AS total\_capacity

FROM Machine m

GROUP BY m.identifier;

-- Number of Orders Placed by Customer:

SELECT c.company\_name, COUNT(o.bill\_no) AS order\_count

FROM Customer c

LEFT JOIN Orders o ON c.id = o.customer\_id

GROUP BY c.company\_name;

-- Average Maintenance Cost by Machine Type:

SELECT m.identifier, AVG(mt.cost) AS avg\_maintenance\_cost

FROM Machine m

LEFT JOIN Maintenance mt ON m.id = mt.machine\_id

GROUP BY m.identifier;

-- List of Customers with Total Order Amount:

SELECT c.company\_name, SUM(o.amount) AS total\_order\_amount

FROM Customer c

JOIN Orders o ON c.id = o.customer\_id

GROUP BY c.company\_name;

-- Average Production Quantity by Worker Age Group:

SELECT CASE

         WHEN w.age BETWEEN 20 AND 30 THEN '20-30'

         WHEN w.age BETWEEN 31 AND 40 THEN '31-40'

         ELSE 'Above 40'

       END AS age\_group,

       AVG(p.quantity) AS avg\_production\_quantity

FROM Worker w

LEFT JOIN Produced p ON w.id = p.worker\_id

GROUP BY age\_group;

-- Maximum Maintenance Cost by Worker Gender:

SELECT w.gender, MAX(mt.cost) AS max\_maintenance\_cost

FROM Worker w

LEFT JOIN Machine m ON w.id = m.worker\_id

LEFT JOIN Maintenance mt ON m.id = mt.machine\_id

GROUP BY w.gender;

-- List of Machines with Total Maintenance Cost:

SELECT m.identifier, SUM(mt.cost) AS total\_maintenance\_cost

FROM Machine m

LEFT JOIN Maintenance mt ON m.id = mt.machine\_id

GROUP BY m.identifier;

-- Average Order Quantity by Customer's State:

SELECT a.city, AVG(o.quantity) AS avg\_order\_quantity

FROM Customer c

JOIN Address a ON c.address\_id = a.address\_id

JOIN Orders o ON c.id = o.customer\_id

GROUP BY a.city;

-- Total Production Quantity by Worker's Gender:

SELECT w.gender, SUM(p.quantity) AS total\_production\_quantity

FROM Worker w

LEFT JOIN Produced p ON w.id = p.worker\_id

GROUP BY w.gender;

-- Average Material Rate by Material Type:

SELECT m.identifier, AVG(m.rate) AS avg\_material\_rate

FROM Material m

GROUP BY m.identifier;

-- Top 5 Customers with the Highest Total Order Amount:

SELECT c.company\_name, SUM(o.amount) AS total\_order\_amount

FROM Customer c

JOIN Orders o ON c.id = o.customer\_id

GROUP BY c.company\_name

ORDER BY total\_order\_amount DESC

LIMIT 5;

-- List of Machines with Maintenance Date of Last Maintenance:

SELECT m.identifier, MAX(mt.maintenance\_date) AS last\_maintenance\_date

FROM Machine m

LEFT JOIN Maintenance mt ON m.id = mt.machine\_id

GROUP BY m.identifier;

-- Number of Orders Placed per Month:

SELECT DATE\_FORMAT(o.order\_date, '%Y-%m') AS order\_month, COUNT(o.bill\_no) AS order\_count

FROM Orders o

GROUP BY order\_month;

-- Average Production Rate by Machine Type and Worker Gender:

SELECT m.identifier, w.gender, AVG(p.rate) AS avg\_production\_rate

FROM Machine m

LEFT JOIN Worker w ON m.worker\_id = w.id

LEFT JOIN Produced p ON w.id = p.worker\_id

GROUP BY m.identifier, w.gender;

-- List of Customers who Placed Orders but Haven't Paid Yet:

SELECT c.company\_name

FROM Customer c

JOIN Orders o ON c.id = o.customer\_id

WHERE o.isPaymentDone = FALSE;