Energy Industry Database

WEST TEXAS ENERGY COMPANY

Database Systems Design

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Table of Contents

Energy Industry Database

The electric power industry currently suffers from significant issues concerning overcharging stemming from inaccurate data collection. Many utility companies, in an attempt to rectify this, are transitioning from outdated meters to new smart meters. These advanced meters not only collect more data but also enhance the accuracy of individual customer energy consumption metrics. Old systems can't handle the detailed data from new meters, causing wrong bills and wasted money on unnecessary refunds.

Objective & Benefits of the New Database

West Texas Energy's database targets this very problem, aiming to:

- **Increase Data Integrity**: By integrating data from the new meters, the database ensures accurate tracking of customer electricity usage.
- **Financial Efficiency**: Accurate billing minimizes reimbursements, allowing the company to reallocate those funds more effectively.
- **Enhance Customer Trust**: Accurate charges gain customer trust, ensuring they feel fairly billed.

Intended Users & Use Cases

This database will primarily serve electric companies' internal teams:

- **Technicians**: Crucial for managing and handling service orders related to meter installations and maintenance.
- **Administrative and Accounting Staff**: They will use this database for accurate billing and financial tracking.

West Texas Energy's Business Rules and User Requirements

Each Customer is uniquely identified by a Customer_ID. Additionally, we store the customer's Name, Address, multiple Contact Numbers and their Email.

In an attempt to offer precise billing, we've introduced Smart Meters. Each meter has a unique Meter_ID, Energy_Usage (representing kWh) to track power consumption, and an Installation_Date.

A Customer can have one or many Meters, but a meter can be assigned to zero or one Customer.

We categorize our Employees under Administrators, Accounting Staff, and Technicians. Each employee has a distinct Employee_ID, Name, Employee_Phone, Birthday, and a Department.

Specializing further:

- Administrators have Experience.
- Accountants are assigned a Rank.

- Technicians possess a set of Skills.

Our Technicians receive Service Orders. A service order has an Order_ID, Order_Type, Order_Status, and a Date_Started. These orders might relate to one or many meters, and a single technician might have multiple service orders, though sometimes they might not have any. A Customer can request no or multiple service orders, but each service order is for exactly one customer. Similarly, each service order can be for multiple meters, but a meter might have no service orders or just one.

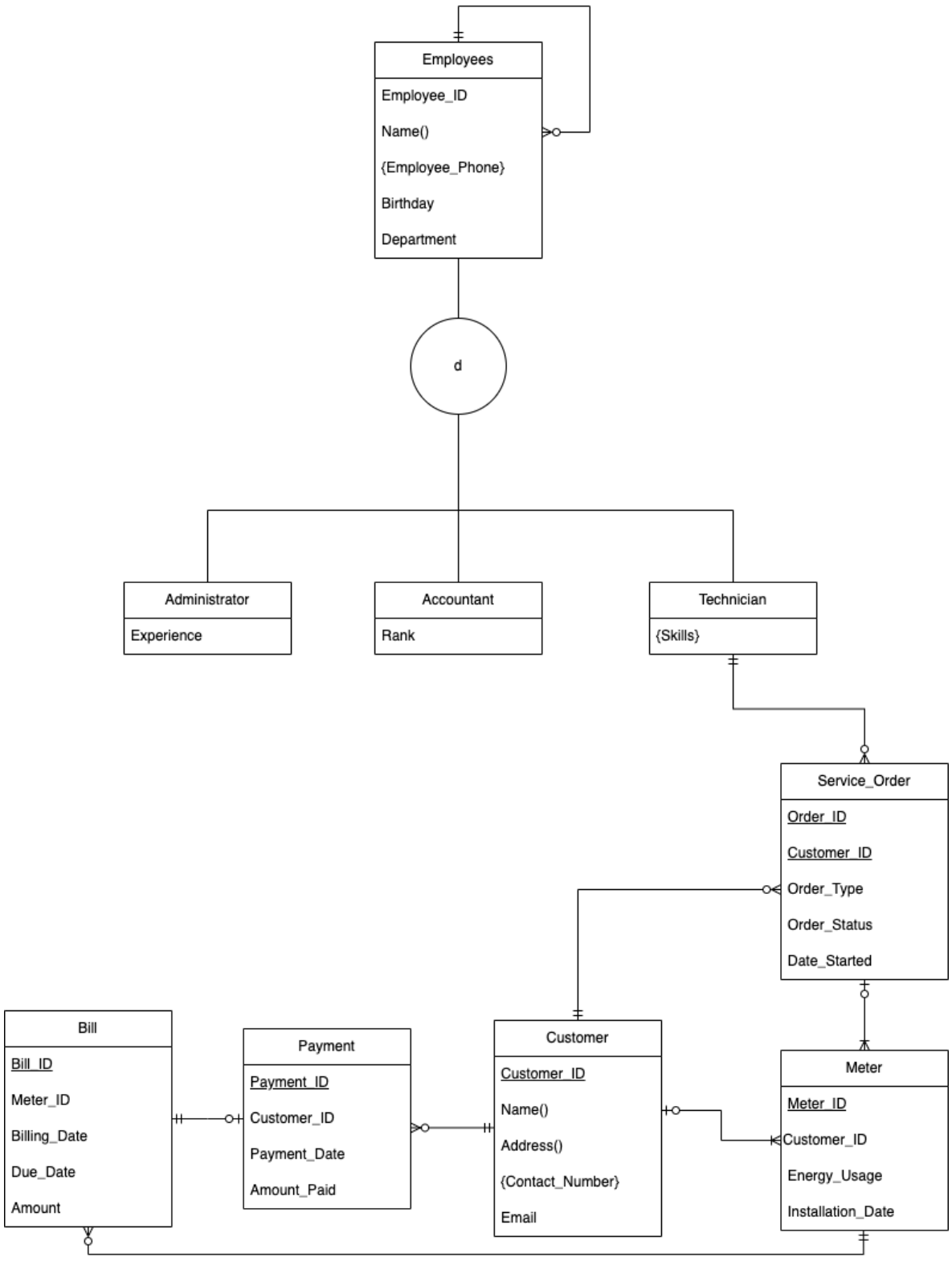
We generate Bills for our customers based on their meter readings. Each bill has a Bill_ID, Billing_Date, Due_Date, and Amount_Due. A customer might have multiple bills or none, but each bill pertains to one particular customer.

We calculate the Bill amount off of the Meter reading. A Bill relates to one and only one meter, but a Meter can have zero or many Bills.

When a customer settles their bill, the transaction gets recorded in our Payment table. Each payment entry has a Payment_ID, Payment_Date, and Amount_Paid.

The onboarding process consists of a Training phase. New employees are mentored by existing employees from the same department. Each new recruit undergoes training by one particular employee, though an existing employee can train multiple new employees or none.

Entity Relationship Diagram



Relations


Employees
Employee_ID
FName
LName
Phone_ID
Birthday
Department
Trainer_ID
Phone_ID
Phone_Number
Administrator
Ad_Employee_ID
Expiriece
Accountant
AC_Employee_ID
Rank
Technician
TE_Employee_ID
Skill_ID
Skill_ID
Skill
Service_order
Order_ID
Order_Type
Order_Status
Date_Started
TE_Employee_ID
Customer_ID
Meter
Meter_ID
Energy_Usage
Instalation_Date
Order_ID
Customer_ID
Customer
Customer_ID
FName
LName
Street
City
State
Zip
CPhone_ID
Email
CPhone_ID
CPhone_Number
Payment
Payment_ID
Payment_Date
Amount_Paid
Customer_ID
Bill_ID
Bill
Bill_ID
Billing_Date
Due_date
Amount
Meter_ID

Code

```
CREATE DATABASE WTEDB;

USE WTEDB;

CREATE TABLE employee_table (
    employee_id INT NOT NULL,
    fname VARCHAR(30),
    lname VARCHAR(30),
    phone_id INT NOT NULL,
    birthday DATE,
    department VARCHAR(30),
    trainer_id INT NOT NULL,
    CONSTRAINT pk_eid PRIMARY KEY (employee_id),
    CONSTRAINT t_id FOREIGN KEY (trainer_id) REFERENCES
employee_table(employee_id),
    INDEX idx_phone_id (phone_id));

CREATE TABLE employee_phonelist_table (
    phone_id INT NOT NULL,
    phone_number VARCHAR(15),
    CONSTRAINT fk_pid FOREIGN KEY (phone_id) REFERENCES
employee_table(phone_id));
```

```
CREATE TABLE administrator_table
        (ad_employee_id INT NOT NULL,
    experience varchar(30),
    CONSTRAINT a_eid PRIMARY KEY (ad_employee_id),
    CONSTRAINT fk_aid FOREIGN KEY (ad_employee_id) REFERENCES
employee_table(employee_id));

CREATE TABLE accountant_table
        (ac_employee_id INT NOT NULL,
    ac_rank varchar(30),
    CONSTRAINT ac_eid PRIMARY KEY (ac_employee_id),
    CONSTRAINT fk_acid FOREIGN KEY (ac_employee_id) REFERENCES
employee_table(employee_id));

CREATE TABLE technician_table
        (te_employee_id INT NOT NULL,
    skill_id INT NOT NULL,
    CONSTRAINT te_tid PRIMARY KEY (te_employee_id),
    CONSTRAINT fk_teid FOREIGN KEY (te_employee_id) REFERENCES
employee_table(employee_id),
    INDEX idx_skill_id (skill_id));
```

```
CREATE TABLE skill_table
        (skill_id INT NOT NULL,
    skill varchar(50),
    CONSTRAINT fk_sid FOREIGN KEY (skill_id) REFERENCES
technician_table(skill_id));

CREATE TABLE customer_table (
    customer_id INT NOT NULL,
    fname VARCHAR(30),
    lname VARCHAR(30),
    street VARCHAR(30),
    city VARCHAR(30),
    state VARCHAR(30),
    zip VARCHAR(30),
    cphone_id INT NOT NULL,
    email VARCHAR(30),
    CONSTRAINT pk_cid PRIMARY KEY (customer_id),
    INDEX idx_cphone_id (cphone_id)
);

CREATE TABLE customer_phonelist_table (
    phone_id INT NOT NULL,
    phone_number VARCHAR(15),
```

```
    CONSTRAINT fk_cpid FOREIGN KEY (phone_id) REFERENCES
customer_table(cphone_id)
);

CREATE TABLE service_order_table (
    order_id INT NOT NULL,
    customer_id INT NOT NULL,
    technician_id INT,
    order_type VARCHAR(30),
    order_status VARCHAR(30),
    date_started DATE,
    CONSTRAINT pk_soid PRIMARY KEY (order_id),
    CONSTRAINT fk_soid_customer FOREIGN KEY (customer_id) REFERENCES
customer_table(customer_id),
    CONSTRAINT fk_technician_id FOREIGN KEY (technician_id) REFERENCES
technician_table(te_employee_id)
);

CREATE TABLE meter_table (
    meter_id INT NOT NULL,
    customer_id INT NOT NULL,
    energy_usage VARCHAR(30),
    installation_date DATE,
```

```
    CONSTRAINT pk_mid PRIMARY KEY (meter_id),
    CONSTRAINT fk_mid_customer FOREIGN KEY (customer_id) REFERENCES
customer_table(customer_id)
);

CREATE TABLE bill_table (
    bill_id INT NOT NULL,
    meter_id INT NOT NULL,
    billing_date DATE,
    due_date DATE,
    amount_due INT,
    CONSTRAINT pk_bid PRIMARY KEY (bill_id),
    CONSTRAINT fk_bid_meter FOREIGN KEY (meter_id) REFERENCES
meter_table(meter_id)
);

CREATE TABLE payment_table (
    payment_id INT NOT NULL,
    customer_id INT NOT NULL,
    bill_id INT NOT NULL,
    payment_date DATE,
    amount_paid INT,
    CONSTRAINT pk_payment_id PRIMARY KEY (payment_id),
```

```
    CONSTRAINT fk_payment_customer_id FOREIGN KEY (customer_id)
REFERENCES customer_table(customer_id),
    CONSTRAINT fk_pbid FOREIGN KEY (bill_id) REFERENCES bill_table(bill_id)
);

DESC employee_table;
DESC employee_phonelist_table;
DESC administrator_table;
DESC accountant_table;
DESC technician_table;
DESC skill_table;
DESC customer_phonelist_table;
DESC service_order_table;
DESC meter_table;
DESC bill_table;
DESC payment_table;
DESC customer_table;

INSERT INTO employee_table
VALUES
        (0, 'John', 'Doe', 0, '1541-05-15', 'Administrator', 0),
    (1, 'Darrian', 'Lambert', 1, '2001-05-18', 'Technician', 0),
    (2, 'Sebastian', 'Gonzalez', 2, '2000-01-01', 'Accountant', 0),
```

```
    (3, 'Smith', 'Jesko', 3, '1999-12-31', 'Administrator', 0),
    (4, 'Emily', 'Davis', 4, '1992-04-05', 'Technician', 1),
    (5, 'Michael', 'Clark', 5, '1987-07-18', 'Accountant', 2),
    (6, 'Amanda', 'Taylor', 6, '2020-01-30', 'Technician', 1),
    (7, 'David', 'Anderson', 7, '1983-09-25', 'Technician', 4),
    (8, 'Sophia', 'Moore', 8, '1991-11-08', 'Technician', 6),
    (9, 'Daniel', 'Miller', 9, '2003-03-17', 'Accountant', 3);

SELECT * FROM employee_table;

INSERT INTO employee_phonelist_table
VALUES
        (0, '(123) 456-7890'),
        (0, '(234) 567-8901'),
        (1, '(345) 678-9012'),
        (2, '(456) 789-0123'),
        (3, '(567) 890-1234'),
        (4, '(678) 901-2345'),
        (4, '(789) 012-3456'),
        (4, '(890) 123-4567'),
        (5, '(901) 234-5678'),
        (6, '(012) 345-6789'),
        (7, '(210) 987-6543'),
```

```
        (8, '(321) 876-5432'),
        (8, '(432) 765-4321'),
        (9, '(543) 654-3210'),
        (9, '(654) 543-2109');

SELECT * FROM employee_phonelist_table;

INSERT INTO administrator_table
VALUES
        (0, '423 years'),
    (3, '4 years');

SELECT * FROM administrator_table;

INSERT INTO accountant_table
VALUES
        (2, 'Rank 1'),
    (5, 'Rank 2'),
    (9, 'Rank 3');

SELECT * FROM accountant_table;

INSERT INTO technician_table
```

```
VALUES
        (1, 1),
    (4, 4),
    (6, 6),
    (7, 7),
    (8, 8);

SELECT * FROM technician_table;

INSERT INTO skill_table
VALUES
        (1, 'Installation'),
    (4, 'Repair'),
    (6, 'Installation'),
    (7, 'Repair'),
    (8, 'Repair');

SELECT * FROM skill_table;

INSERT INTO customer_table
VALUES
        (0, 'James', 'Green', 'Blue st.', 'Amarillo', 'TX', '79109', 0, 'JGreen@yahoo.com'),
    (1, 'Mark', 'Blue', 'Orange st.', 'Canyon', 'TX', '79106', 1, 'MB2323@Gmail.com'),
```

```
    (2, 'Susan', 'Orange', 'Yellow st.', 'Duma', 'TX', '79108', 2,
'OOOOOweeee@Gmail.com'),
    (3, 'Greggor', 'Yellow', 'Red st.', 'Dallas', 'TX', '79102', 3,
'YellowGreggor@yahoo.com'),
    (4, 'Remi', 'Red', 'Green st.', 'Austin', 'TX', '79111', 4, 'RemRem@Gmail.com');

SELECT * FROM customer_table;

INSERT INTO customer_phonelist_table
VALUES
        (0, '(123) 456-7890'),
        (0, '(234) 567-8901'),
        (0, '(345) 678-9012'),
        (0, '(456) 789-0123'),
        (1, '(567) 890-1234'),
        (1, '(678) 901-2345'),
        (2, '(789) 012-3456'),
        (3, '(890) 123-4567'),
        (4, '(901) 234-5678');

SELECT * FROM customer_phonelist_table;

INSERT INTO service_order_table
```

```
VALUES
        (0, 0, 1, 'Installation', 'Complete', '2023-11-01'),
    (1, 0, 4, 'Repair', 'Complete', '2023-11-02'),
    (2, 1, 7, 'Repair', 'In Progress', '2023-11-03'),
    (3, 2, 6, 'Installation', 'In Progress', '2023-11-04'),
    (4, 3, 4, 'Repair', 'In Progress', '2023-11-05'),
    (5, 4, 1, 'Installation', 'In Progress', '2023-11-06');

SELECT * FROM service_order_table;

INSERT INTO meter_table
VALUES
        (0, 0, '30KWH', '2022-09-07'),
    (1, 0, '3000KWH', '2023-11-01'),
    (2, 1, '15KWH', '2019-03-30'),
    (3, 2, '12KWH', '2021-06-11'),
    (4, 3, '45KWH', '2023-01-21'),
    (5, 4, '70KWH', '2023-11-06');

SELECT * FROM meter_table;

INSERT INTO bill_table
VALUES
```

```
        (0, 0, '2023-10-01', '2023-11-01', 60),
    (1, 1, '2023-11-01', '2023-11-30', 6000),
    (2, 2, '2023-10-01', '2023-11-01', 30),
    (3, 3, '2023-10-01', '2023-11-01', 24),
    (4, 4, '2023-10-01', '2023-11-01', 90),
    (5, 5, '2023-11-01', '2023-11-30', 140);

SELECT * FROM bill_table;

INSERT INTO payment_table
VALUES
        (0, 0, 0, '2023-10-20', '60'),
    (1, 0, 1, '2023-11-20', '6000'),
    (2, 1, 2, '2023-10-15', '30'),
    (3, 2, 3, '2023-10-31', '24'),
    (4, 3, 4, '2023-10-16', '90'),
    (5, 4, 5, '2023-11-19', '140');

SELECT * FROM payment_table;

SELECT e.fname First, e.lname Last, ep.phone_number PhoneNumber
FROM employee_table e
JOIN employee_phonelist_table ep ON e.phone_id = ep.phone_id;
```

```
SELECT b.amount_due Due, b.billing_date Date_Billed, c.fname First, c.lname Last,
m.energy_usage Energy_Usage
FROM bill_table b
JOIN meter_table m ON b.meter_id = m.meter_id
JOIN customer_table c ON m.customer_id = c.customer_id;

SELECT e.fname AS employee_first_name, e.lname AS employee_last_name, t.fname
AS trainer_first_name, t.lname AS trainer_last_name
FROM employee_table e
LEFT JOIN employee_table t ON e.trainer_id = t.employee_id;

SELECT p.amount_paid Amount_Paid, p.payment_date Date_Paid, c.fname First,
c.lname Last
FROM payment_table p
JOIN customer_table c ON p.customer_id = c.customer_id;

SELECT AVG(amount_due) AS average_bill_amount
FROM bill_table;

SELECT * FROM service_order_table
WHERE technician_id = 1
ORDER BY date_started
```

```
DESC LIMIT 1;

SELECT DISTINCT c.fname First_Name, c.lname Last_name, MIN(p.phone_number)
AS phone_number FROM customer_table c JOIN customer_phonelist_table p
ON c.cphone_id = p.phone_id
GROUP BY c.fname, c.lname;

SELECT fname First_Name, lname Last_Name, street, city, state, zip
FROM customer_table
WHERE customer_id = 1;

SELECT AVG(CAST(SUBSTRING_INDEX(SUBSTRING_INDEX(energy_usage, 'KWH',
1), ' ', -1) AS UNSIGNED)) AS AVG_kwh_usage
FROM meter_table;

SELECT bill_table.*, payment_table.payment_date, payment_table.amount_paid
FROM payment_table JOIN bill_table
ON payment_table.bill_id = bill_table.bill_id
WHERE payment_table.payment_date >= CURRENT_DATE - 30;

SELECT c.fname, c.lname, m.installation_date
FROM customer_table c JOIN meter_table m
ON c.customer_id = m.customer_id
```

```
WHERE c.customer_id = 3;
```

```
SELECT fname, lname, department, birthday, FLOOR(DATEDIFF(CURDATE(),
birthday) / 365) AS age
FROM employee_table
```

Tables

```
DESC employee_table;
```

Field	Type	Null	Key	Default	Extra
employee_id	int	NO	PRI	NULL	
fname	varchar(30)	YES		NULL	
lname	varchar(30)	YES		NULL	
phone_id	int	NO	MUL	NULL	
birthday	date	YES		NULL	
department	varchar(30)	YES		NULL	
trainer_id	int	NO	MUL	NULL	

```
SELECT * FROM employee_table;
```

employee_id	fname	lname	phone_id	birthday	department	trainer_id
0	John	Doe	0	1541-05-15	Administrator	0
1	Darrian	Lambert	1	2001-05-18	Technician	0
2	Sebastian	Gonzalez	2	2000-01-01	Accountant	0
3	Smith	Jesko	3	1999-12-31	Administrator	0
4	Emily	Davis	4	1992-04-05	Technician	1
5	Michael	Clark	5	1987-07-18	Accountant	2
6	Amanda	Taylor	6	2020-01-30	Technician	1
7	David	Anderson	7	1983-09-25	Technician	4
8	Sophia	Moore	8	1991-11-08	Technician	6
9	Daniel	Miller	9	2003-03-17	Accountant	3

DESC employee_phonelist_table;

Field	Type	Null	Key	Default	Extra
phone_id	int	NO	MUL	NULL	
phone_number	varchar(15)	YES		NULL	

SELECT * FROM employee_phonelist_table;

phone_id	phone_number
0	(123) 456-7890
0	(234) 567-8901
1	(345) 678-9012
2	(456) 789-0123
3	(567) 890-1234
4	(678) 901-2345
4	(789) 012-3456
4	(890) 123-4567
5	(901) 234-5678
6	(012) 345-6789
7	(210) 987-6543
8	(321) 876-5432
8	(432) 765-4321
9	(543) 654-3210
9	(654) 543-2109

DESC administrator_table;

Field	Type	Null	Key	Default	Extra
ad_employee_id	int	NO	PRI	NULL	
experience	varchar(30)	YES		NULL	

SELECT * FROM administrator_table;

ad_employee_id	experience
0	423 years
3	4 years

DESC accountant_table;

Field	Type	Null	Key	Default	Extra
ac_employee_id	int	NO	PRI	NULL	
ac_rank	varchar(30)	YES		NULL	

SELECT * FROM accountant_table;

ac_employee_id	ac_rank
2	Rank 1
5	Rank 2
9	Rank 3

DESC technician_table;

Field	Type	Null	Key	Default	Extra
te_employee_id	int	NO	PRI	NULL	
skill_id	int	NO	MUL	NULL	

SELECT * FROM technician_table;

te_employee_id	skill_id
1	1
4	4
6	6
7	7
8	8

DESC skill_table;

Field	Type	Null	Key	Default	Extra
skill_id	int	NO	MUL	NULL	
skill	varchar(50)	YES		NULL	

SELECT * FROM skill_table;

skill_id	skill
1	Inst…
4	Repair
6	Inst…
7	Repair
8	Repair

DESC customer_table;

Field	Type	Null	Key	Default	Extra
customer_id	int	NO	PRI	NULL	
fname	varchar(30)	YES		NULL	
lname	varchar(30)	YES		NULL	
street	varchar(30)	YES		NULL	
city	varchar(30)	YES		NULL	
state	varchar(30)	YES		NULL	
zip	varchar(30)	YES		NULL	
cphone_id	int	NO	MUL	NULL	
email	varchar(30)	YES		NULL	

SELECT * FROM customer_table;

customer_id	fname	lname	street	city	state	zip	cphone_id	email
0	James	Green	Blue st.	Amarillo	TX	79109	0	JGreen@yahoo.com
1	Mark	Blue	Orange st.	Canyon	TX	79106	1	MB2323@Gmail.com
2	Susan	Orange	Yellow st.	Duma	TX	79108	2	OOOOOweeee@Gmail.com
3	Greggor	Yellow	Red st.	Dallas	TX	79102	3	YellowGreggor@yahoo.com
4	Remi	Red	Green st.	Austin	TX	79111	4	RemRem@Gmail.com

DESC customer_phonelist_table;

Field	Type	Null	Key	Default	Extra
phone_id	int	NO	MUL	NULL	
phone_number	varchar(15)	YES		NULL	

SELECT * FROM customer_phonelist_table;

phone_id	phone_number
0	(123) 456-7890
0	(234) 567-8901
0	(345) 678-9012
0	(456) 789-0123
1	(567) 890-1234
1	(678) 901-2345
2	(789) 012-3456
3	(890) 123-4567
4	(901) 234-5678

DESC service_order_table;

Field	Type	Null	Key	Default	Extra
order_id	int	NO	PRI	NULL	
customer_id	int	NO	MUL	NULL	
technician_id	int	YES	MUL	NULL	
order_type	varchar(30)	YES		NULL	
order_status	varchar(30)	YES		NULL	
date_started	date	YES		NULL	

SELECT * FROM service_order_table;

order_id	customer_id	technician_...	order_type	order_status	date_started
0	0	1	Installation	Complete	2023-11-01
1	0	4	Repair	Complete	2023-11-02
2	1	7	Repair	In Progress	2023-11-03
3	2	6	Installation	In Progress	2023-11-04
4	3	4	Repair	In Progress	2023-11-05
5	4	1	Installation	In Progress	2023-11-06

DESC meter_table;

Field	Type	Null	Key	Default	Extra
meter_id	int	NO	PRI	NULL	
customer_id	int	NO	MUL	NULL	
energy_usage	varchar(30)	YES		NULL	
installation_date	date	YES		NULL	

SELECT * FROM meter_table;

meter_id	customer_id	energy_usage	installation_date
0	0	30KWH	2022-09-07
1	0	3000KWH	2023-11-01
2	1	15KWH	2019-03-30
3	2	12KWH	2021-06-11
4	3	45KWH	2023-01-21
5	4	70KWH	2023-11-06

DESC bill_table;

Field	Type	Null	Key	Default	Extra
bill_id	int	NO	PRI	NULL	
meter_id	int	NO	MUL	NULL	
billing_date	date	YES		NULL	
due_date	date	YES		NULL	
amount_due	int	YES		NULL	

SELECT * FROM bill_table;

bill_id	meter_id	billing_date	due_date	amount_due
0	0	2023-10-01	2023-11-01	60
1	1	2023-11-01	2023-11-30	6000
2	2	2023-10-01	2023-11-01	30
3	3	2023-10-01	2023-11-01	24
4	4	2023-10-01	2023-11-01	90
5	5	2023-11-01	2023-11-30	140

DESC payment_table;

Field	Type	Null	Key	Default	Extra
payment_id	int	NO	PRI	NULL	
customer_id	int	NO	MUL	NULL	
bill_id	int	NO	MUL	NULL	
payment_date	date	YES		NULL	
amount_paid	int	YES		NULL	

SELECT * FROM payment_table;

	payment_id	customer_id	bill_id	payment_date	amount_paid
	0	0	0	2023-10-20	60
	1	0	1	2023-11-20	6000
	2	1	2	2023-10-15	30
	3	2	3	2023-10-31	24
	4	3	4	2023-10-16	90
	5	4	5	2023-11-19	140

Use Examples

List all employees with their phone numbers:

```
SELECT e.fname First, e.lname Last, ep.phone_number PhoneNumber
FROM employee_table e
JOIN employee_phonelist_table ep ON e.phone_id = ep.phone_id;
```

	First	Last	PhoneNumber
	John	Doe	(123) 456-7890
	John	Doe	(234) 567-8901
	Darrian	Lambert	(345) 678-9012
	Sebastian	Gonzalez	(456) 789-0123
	Smith	Jesko	(567) 890-1234
	Emily	Davis	(678) 901-2345
	Emily	Davis	(789) 012-3456
	Emily	Davis	(890) 123-4567
	Michael	Clark	(901) 234-5678
	Amanda	Taylor	(012) 345-6789
	David	Anderson	(210) 987-6543
	Sophia	Moore	(321) 876-5432
	Sophia	Moore	(432) 765-4321
	Daniel	Miller	(543) 654-3210
	Daniel	Miller	(654) 543-2109

List all bills with customer information and meter readings:

```
SELECT b.amount_due Due, b.billing_date Date_Billed, c.fname First, c.lname Last,
m.energy_usage Energy_Usage
FROM bill_table b
JOIN meter_table m ON b.meter_id = m.meter_id
JOIN customer_table c ON m.customer_id = c.customer_id;
```

	Due	Date_Billed	First	Last	Energy_Usage
	60	2023-10-01	James	Green	30KWH
	6000	2023-11-01	James	Green	3000KWH
	30	2023-10-01	Mark	Blue	15KWH
	24	2023-10-01	Susan	Orange	12KWH
	90	2023-10-01	Greggor	Yellow	45KWH
	140	2023-11-01	Remi	Red	70KWH

List employees and their trainers:

```
SELECT e.fname AS employee_first_name, e.lname AS employee_last_name, t.fname
AS trainer_first_name, t.lname AS trainer_last_name
FROM employee_table e
LEFT JOIN employee_table t ON e.trainer_id = t.employee_id;
```

employee_first_na...	employee_last_na...	trainer_first_na...	trainer_last_na...
John	Doe	John	Doe
Darrian	Lambert	John	Doe
Sebastian	Gonzalez	John	Doe
Smith	Jesko	John	Doe
Emily	Davis	Darrian	Lambert
Michael	Clark	Sebastian	Gonzalez
Amanda	Taylor	Darrian	Lambert
David	Anderson	Emily	Davis
Sophia	Moore	Amanda	Taylor
Daniel	Miller	Smith	Jesko

Show payments made by customers:

```
SELECT p.amount_paid Amount_Paid, p.payment_date Date_Paid, c.fname First,

c.lname Last

FROM payment_table p

JOIN customer_table c ON p.customer_id = c.customer_id;
```

Amount_Paid	Date_Paid	First	Last
60	2023-10-20	James	Green
6000	2023-11-20	James	Green
30	2023-10-15	Mark	Blue
24	2023-10-31	Susan	Orange
90	2023-10-16	Greggor	Yellow
140	2023-11-19	Remi	Red

The accountant wants to know the avg price of all bills:

```
SELECT AVG(amount_due) AS average_bill_amount

FROM bill_table;
```

	average_bill_amount
	1057.3333

Employee #1 wants to know the last service order they worked on:

SELECT * FROM service_order_table

WHERE technician_id = 1

ORDER BY date_started

DESC LIMIT 1;

	order_id	customer_id	technician_...	order_type	order_status	date_started
	5	4	1	Installation	In Progress	2023-11-06

The service department wants to know one phone number from each customer:

SELECT DISTINCT c.fname First_Name, c.lname Last_name, MIN(p.phone_number)

AS phone_number FROM customer_table c JOIN customer_phonelist_table p

ON c.cphone_id = p.phone_id

GROUP BY c.fname, c.lname;

	First_Name	Last_name	phone_number
	James	Green	(123) 456-7890
	Mark	Blue	(567) 890-1234
	Susan	Orange	(789) 012-3456
	Greggor	Yellow	(890) 123-4567
	Remi	Red	(901) 234-5678

The billing department wants to know Mark Blue's address to send their monthly bill:

```
SELECT fname First_Name, lname Last_Name, street, city, state, zip
FROM customer_table
WHERE customer_id = 1;
```

First_Name	Last_Name	street	city	state	zip
Mark	Blue	Orange st.	Canyon	TX	79106

The billing department wants to know the average Kwh usage for all meters:

```
SELECT AVG(CAST(SUBSTRING_INDEX(SUBSTRING_INDEX(energy_usage, 'KWH',
1), ' ', -1) AS UNSIGNED)) AS AVG_kwh_usage
FROM meter_table;
```

AVG_kwh_usage
528.6667

The billing department wants to know all of the bills paid in the last 30 days:

```
SELECT bill_table.*, payment_table.payment_date, payment_table.amount_paid
FROM payment_table JOIN bill_table
ON payment_table.bill_id = bill_table.bill_id
WHERE payment_table.payment_date >= CURRENT_DATE - 30;
```

bill_id	meter_id	billing_da...	due_date	amount_due	payment_date	amount_paid
1	1	2023-11-01	2023-11-30	6000	2023-11-20	6000
5	5	2023-11-01	2023-11-30	140	2023-11-19	140

Greggor Yellow's meter needs to be replaced and the technician wants to check when the meter was installed:

```
SELECT c.fname, c.lname, m.installation_date
```

```
FROM customer_table c JOIN meter_table m
ON c.customer_id = m.customer_id
WHERE c.customer_id = 3;
```

	fname	lname	installation_date
	Greggor	Yellow	2023-01-21

Management wants to know the age of employees to help with making accurate birthday cards.

```
SELECT fname, lname, department, birthday, FLOOR(DATEDIFF(CURDATE(),
birthday) / 365) AS age
FROM employee_table
```

	fname	lname	department	birthday	age
	John	Doe	Administrator	1541-05-15	482
	Darrian	Lambert	Technician	2001-05-18	22
	Sebastian	Gonzalez	Accountant	2000-01-01	23
	Smith	Jesko	Administrator	1999-12-31	23
	Emily	Davis	Technician	1992-04-05	31
	Michael	Clark	Accountant	1987-07-18	36
	Amanda	Taylor	Technician	2020-01-30	3
	David	Anderson	Technician	1983-09-25	40
	Sophia	Moore	Technician	1991-11-08	32
	Daniel	Miller	Accountant	2003-03-17	20

Peer review

X = signed

We feel confident in the group's efforts throughout this project.

Darrian Lambert: X

Sebastian Gonzalez: X

Smith Jesko: X

Works Cited

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