

CS306 Project Phase 2Patient and owe_bill tables

```
CREATE TABLE Patients(  
    p_id INT,  
    gender varchar(1),  
    p_name varchar(50),  
    contact varchar(50),  
    bday DATE,  
    primary key (p_id)  
);  
  
CREATE TABLE owe_bill(  
    bill_id INT,  
    p_id INT,  
    charges INT,  
    date DATE,  
    primary key (bill_id),  
    Foreign Key (p_id) References Patients(p_id)  
);
```

For the Patient table:

- $p_id \rightarrow \{gender, p_name, contact, bday\}$
- There are no partial dependencies.
- This table is already in BCNF.

For the owe_bill table:

- $bill_id \rightarrow \{p_id, charges, date\}$
- There are no partial dependencies.
- This table is already in BCNF.

INSERTED DATAS

```
INSERT INTO Patients VALUES (11, 'M', 'David Johnson', '5551111111', '1990-04-15');
INSERT INTO Patients VALUES (12, 'F', 'Sophie Brown', '5552222222', '1986-09-22');
INSERT INTO Patients VALUES (13, 'M', 'James Smith', '5553333333', '1977-11-03');
INSERT INTO Patients VALUES (14, 'F', 'Chloe Davis', '5554444444', '1972-03-14');
INSERT INTO Patients VALUES (15, 'M', 'Benjamin Wilson', '5555555555', '1958-08-25');
INSERT INTO Patients VALUES (16, 'F', 'Isabella Martinez', '5556666666', '1989-05-18');
INSERT INTO Patients VALUES (17, 'M', 'Alexander Anderson', '5557777777', '1998-10-09');
INSERT INTO Patients VALUES (18, 'F', 'Mia Taylor', '5558888888', '1966-07-30');
INSERT INTO Patients VALUES (19, 'M', 'Ethan Thomas', '5559999999', '1974-02-15');
INSERT INTO Patients VALUES (20, 'F', 'Amelia Johnson', '5551010101', '1991-06-07');
```



```
INSERT INTO owe_bill VALUES (1, 11, 250, '2024-03-15');
INSERT INTO owe_bill VALUES (2, 12, 300, '2024-03-16');
INSERT INTO owe_bill VALUES (3, 13, 350, '2024-03-17');
INSERT INTO owe_bill VALUES (4, 14, 400, '2024-03-18');
INSERT INTO owe_bill VALUES (5, 15, 450, '2024-03-19');
INSERT INTO owe_bill VALUES (6, 16, 500, '2024-03-20');
INSERT INTO owe_bill VALUES (7, 17, 550, '2024-03-21');
INSERT INTO owe_bill VALUES (8, 18, 600, '2024-03-22');
INSERT INTO owe_bill VALUES (9, 19, 650, '2024-03-23');
INSERT INTO owe_bill VALUES (10, 20, 700, '2024-03-24');
```

SELECT * FROM owe_bill;

	p_id	gender	p_name	contact	bday
▶	11	M	David Johnson	5551111111	1990-04-15
	12	F	Sophie Brown	5552222222	1986-09-22
	13	M	James Smith	5553333333	1977-11-03
	14	F	Chloe Davis	5554444444	1972-03-14
	15	M	Benjamin Wilson	5555555555	1958-08-25
	16	F	Isabella Martinez	5556666666	1989-05-18
	17	M	Alexander Anderson	5557777777	1998-10-09
	18	F	Mia Taylor	5558888888	1966-07-30
	19	M	Ethan Thomas	5559999999	1974-02-15
	20	F	Amelia Johnson	5551010101	1991-06-07
•	NULL	NULL	NULL	NULL	NULL

Patients 9 × owe_bill 10

SELECT * FROM Patients;

Result Grid			Filter Rows:	Edit:
	bill_id	p_id	charges	date
▶	1	11	250	2024-03-15
	2	12	300	2024-03-16
	3	13	350	2024-03-17
	4	14	400	2024-03-18
	5	15	450	2024-03-19
	6	16	500	2024-03-20
	7	17	550	2024-03-21
	8	18	600	2024-03-22
	9	19	650	2024-03-23
	10	20	700	2024-03-24
•	NULL	NULL	NULL	NULL

Patients 9 owe_bill 10 ×

Query Definiton and Relational Algebra Equivalent

English Query: Retrieve patient information along with their corresponding bill details.

Relational Algebra: $\pi(p_id, p_name, charges, date) (\sigma_{Patients.p_id = Bill.p_id} (Patients \bowtie Bill))$

Query in MYSQL

SQL Code:

```
SELECT Patients.p_id, Patients.p_name, owe_bill.charges, owe_bill.date
FROM Patients
JOIN owe_bill ON Patients.p_id = owe_bill.p_id;
```

Table Query

	p_id	p_name	charges	date
▶	11	David Johnson	250	2024-03-15
	12	Sophie Brown	300	2024-03-16
	13	James Smith	350	2024-03-17
	14	Chloe Davis	400	2024-03-18
	15	Benjamin Wilson	450	2024-03-19
	16	Isabella Martinez	500	2024-03-20
	17	Alexander Anderson	550	2024-03-21
	18	Mia Taylor	600	2024-03-22
	19	Ethan Thomas	650	2024-03-23
	20	Amelia Johnson	700	2024-03-24

Result 11 ×

GroupBy Operation

MYSQL code:

```
SELECT Patients.p_id, Patients.p_name, SUM(owe_bill.charges) AS total_charges
FROM Patients
JOIN owe_bill ON Patients.p_id = owe_bill.p_id
GROUP BY Patients.p_id, Patients.p_name;
```

GroupBy Table:

	p_id	p_name	charges	date
▶	11	David Johnson	250	2024-03-15
	12	Sophie Brown	300	2024-03-16
	13	James Smith	350	2024-03-17
	14	Chloe Davis	400	2024-03-18
	15	Benjamin Wilson	450	2024-03-19
	16	Isabella Martinez	500	2024-03-20
	17	Alexander Anderson	550	2024-03-21
	18	Mia Taylor	600	2024-03-22
	19	Ethan Thomas	650	2024-03-23
	20	Amelia Johnson	700	2024-03-24

:

Alter Table Constraint

Code:

```
ALTER TABLE owe_bill ADD CONSTRAINT check_charges CHECK (charges >= 0);
```

```
INSERT INTO owe_bill VALUES (1, 11, -250, '2024-03-15');
```

Error:

44 22:58:09 ALTER TABLE owe_bill ADD CONSTRAINT check_charges CHECK (charges >= 0) Error Code: 3022. Duplicate check constraint name 'check_charges'.