Cafe Shop Management

Objective of this is to apply relational algebra, SQL and constraints/assertions.

```
CREATE TABLE Bill_generates (
    Bill_Number INT,
    OrderID INT,
    CustomerID INT,
    Date DATE,
    Time TIME,
    Total DECIMAL(6, 2),
    Tip_Amount DECIMAL(6, 2),
    Subtotal DECIMAL(6, 2),
    Method CHAR(20) CHECK (Method IN ('cash', 'credit card')),
    PRIMARY KEY (Bill_Number,CustomerID),
    FOREIGN KEY (CustomerID) REFERENCES Table_serves(CustomerID)
);
```

```
CREATE TABLE Table_serves (
    CustomerID INT,
    WaiterID INT,
    OrderID INT,
    PRIMARY KEY (CustomerID),
    FOREIGN KEY (WaiterID) REFERENCES Waiter(WaiterID)
    FOREIGN KEY (OrderID) REFERENCES TableOrder(OrderID)
);
```

```
 INSERT INTO Table_serves (CustomerID, WaiterID, OrderID)
 VALUES
   (1, 11, 1),
   (2, 12, 2),
   (3, 13, 3),
```

```
  (4, 14, 4),
  (5, 13, 5),
  (6, 13, 6),
  (7, 12, 7),
  (8, 12, 8),
  (9, 11, 9),
  (10, 11, 10);
```

```
INSERT INTO Bill_generates (Bill_Number, OrderID, CustomerID, Date, Time, Total,
Tip_Amount, Subtotal, Method)
VALUES
  (1, 1, 1, '2023-11-17', '12:30:00', 50.00, 5.00, 45.00, 'cash'),
  (2, 2, 2, '2023-11-17', '13:45:00', 65.00, 7.00, 58.00, 'credit card'),
  (3, 3, 3, '2023-11-18', '14:15:00', 40.00, 4.00, 36.00, 'cash'),
  (4, 4, 4, '2023-11-18', '15:30:00', 55.00, 6.00, 49.00, 'credit card'),
  (5, 5, 5, '2023-11-19', '16:45:00', 75.00, 8.00, 67.00, 'cash'),
  (6, 6, 6, '2023-11-19', '17:30:00', 60.00, 6.50, 53.50, 'credit card'),
  (7, 7, 7, '2023-11-20', '18:15:00', 90.00, 10.00, 80.00, 'cash'),
  (8, 8, 8, '2023-11-20', '19:00:00', 70.00, 7.50, 62.50, 'credit card'),
  (9, 9, 9, '2023-11-21', '20:15:00', 55.00, 5.50, 49.50, 'cash'),
  (10, 10, 10, '2023-11-21', '21:30:00', 80.00, 9.00, 71.00, 'credit card');
```

4. Display all the rows of the two tables through executing "select * from <table_name> " commands on mysql and include the snapshot of the result in your report.

```
SELECT * FROM Bill_generates;
```

Bill_Number	OrderID	CustomerID	Date	Time	Total	Tip_Amount	Subtotal	Method
1	1	1	2023-11-17	12:30:00	50.00	5.00	45.00	cash
2	2	2	2023-11-17	13:45:00	65.00	7.00	58.00	credit card
3	3	3	2023-11-18	14:15:00	40.00	4.00	36.00	cash
4	4	4	2023-11-18	15:30:00	55.00	6.00	49.00	credit card
5	5	5	2023-11-19	16:45:00	75.00	8.00	67.00	cash
6	6	6	2023-11-19	17:30:00	60.00	6.50	53.50	credit card
7	7	7	2023-11-20	18:15:00	90.00	10.00	80.00	cash
8	8	8	2023-11-20	19:00:00	70.00	7.50	62.50	credit card
9	9	9	2023-11-21	20:15:00	55.00	5.50	49.50	cash
10	10	10	2023-11-21	21:30:00	80.00	9.00	71.00	credit card

```
SELECT * FROM Table_serves
```

	CustomerID	WaiterID	OrderID
	1	11	1
	2	12	2
	3	13	3
	4	14	4
	5	13	5
	6	13	6
	7	12	7
	8	12	8
	9	11	9
	10	11	10

5. Query which will require joining the two of the tables have been selected and its relational algebra equivalent.

Query: Customers who have tipped more than 5

```
π (Bill_generates) (σ(Tip_Amount > 5.00) (Bill_generates))
```

6. The SQL version of the relational algebra query and execute the query in mysql. Include the snapshot of the result in your report.

```
SELECT *
FROM Bill_generates
WHERE Tip_Amount > 5.00;
```

Bill_Number	OrderID	CustomerID	Date	Time	Total	Tip_Amount	Subtotal	Method
2	2	2	2023-11-17	13:45:00	65.00	7.00	58.00	credit card
4	4	4	2023-11-18	15:30:00	55.00	6.00	49.00	credit card
5	5	5	2023-11-19	16:45:00	75.00	8.00	67.00	cash
6	6	6	2023-11-19	17:30:00	60.00	6.50	53.50	credit card
7	7	7	2023-11-20	18:15:00	90.00	10.00	80.00	cash
8	8	8	2023-11-20	19:00:00	70.00	7.50	62.50	credit card
9	9	9	2023-11-21	20:15:00	55.00	5.50	49.50	cash
10	10	10	2023-11-21	21:30:00	80.00	9.00	71.00	credit card

7)7. Write down a query in English which will require "group by" operation, a statistical operator (SUM, AVG, MIN, MX etc), and will also require joining the two tables. Then write down the SQL version, execute it on mysql and include the snapshot of the result in your report.

Query: Total of each payment method total

```
SELECT Method, SUM(Total) AS TotalAmount
FROM Bill_generates
GROUP BY Method;
```

Method	TotalAmount
cash	310.00
credit card	330.00

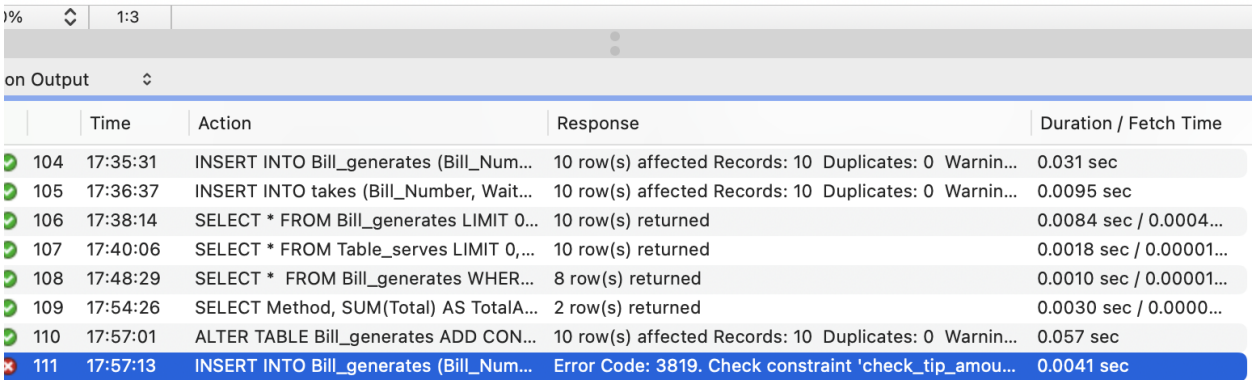
8. Add a "check" constraint to a table in your project by updating the create table statement Your constraint should involve a SQL query. Each student should write a different constraint. Adding a constraint to an existing table is done through the command "ALTER TABLE <table_name> ADD CONSTRAINT CHECK (condition)"

Execute the alter table command on mysql and try to insert a row which does not satisfy the constraint using insert into statement. Include the snapshot of your work in the report which shows that you have added the constraint and tried to insert a row violating that constraint.

```
ALTER TABLE Bill_generates ADD CONSTRAINT check_tip_amount CHECK (Tip_Amount >= 0);
```

6

```
1 •  INSERT INTO Bill_generates (Bill_Number, OrderID, CustomerID, Date, Time, Total, Tip_Amount,
2    VALUES (101, 1, 11, '2023-11-17', '12:00:00', 50.00, -5.00, 45.00, 'credit card');
3
```



)% 1:3

on Output

	Time	Action	Response	Duration / Fetch Time
104	17:35:31	INSERT INTO Bill_generates (Bill_Num...	10 row(s) affected Records: 10 Duplicates: 0 Warnin...	0.031 sec
105	17:36:37	INSERT INTO takes (Bill_Number, Wait...	10 row(s) affected Records: 10 Duplicates: 0 Warnin...	0.0095 sec
106	17:38:14	SELECT * FROM Bill_generates LIMIT 0...	10 row(s) returned	0.0084 sec / 0.0004...
107	17:40:06	SELECT * FROM Table_serves LIMIT 0,...	10 row(s) returned	0.0018 sec / 0.00001...
108	17:48:29	SELECT * FROM Bill_generates WHER...	8 row(s) returned	0.0010 sec / 0.00001...
109	17:54:26	SELECT Method, SUM(Total) AS TotalA...	2 row(s) returned	0.0030 sec / 0.0000...
110	17:57:01	ALTER TABLE Bill_generates ADD CON...	10 row(s) affected Records: 10 Duplicates: 0 Warnin...	0.057 sec
111	17:57:13	INSERT INTO Bill_generates (Bill_Num...	Error Code: 3819. Check constraint 'check_tip_amou...	0.0041 sec