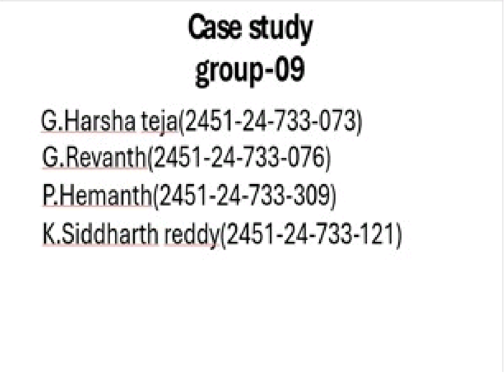
Case Study-03

Construct an ER diagram for a car insurance company whose customers own one or more cars.Each car has associated with a zero to any of recorded accidents



Case study group-09

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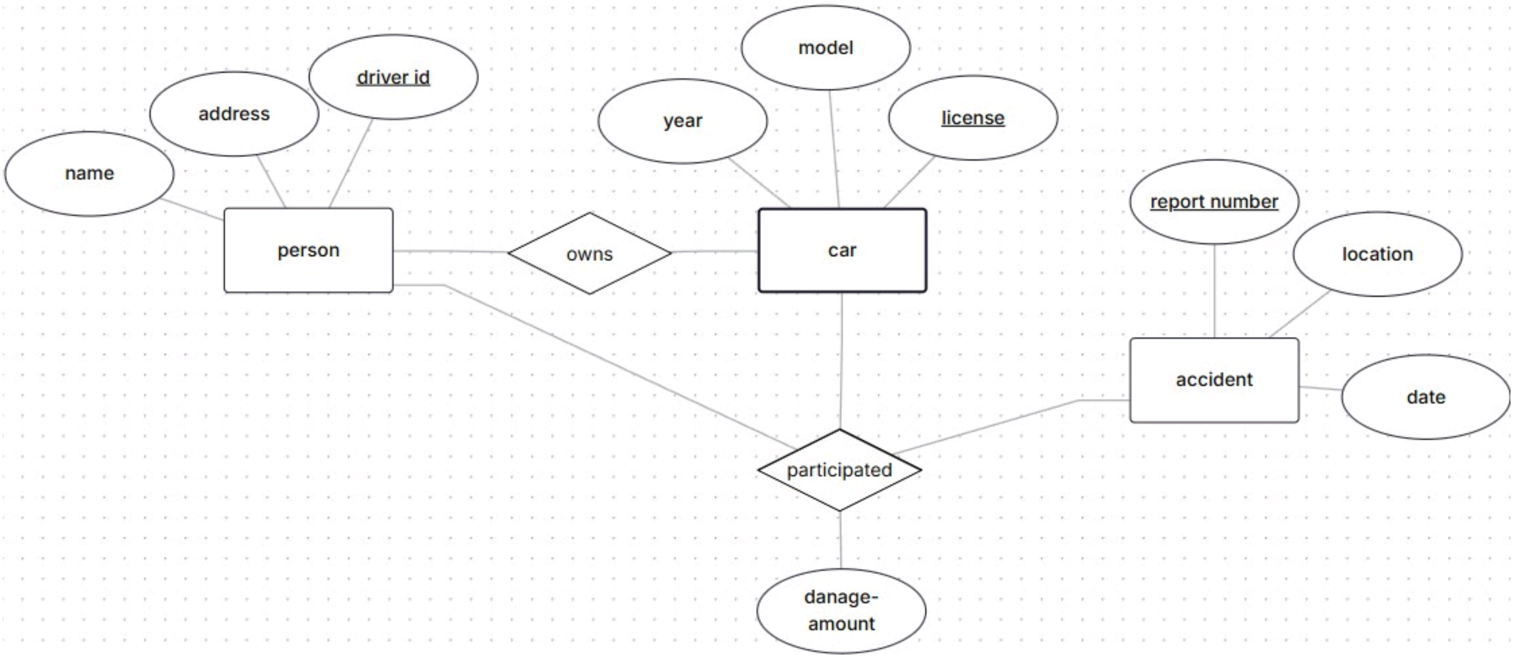
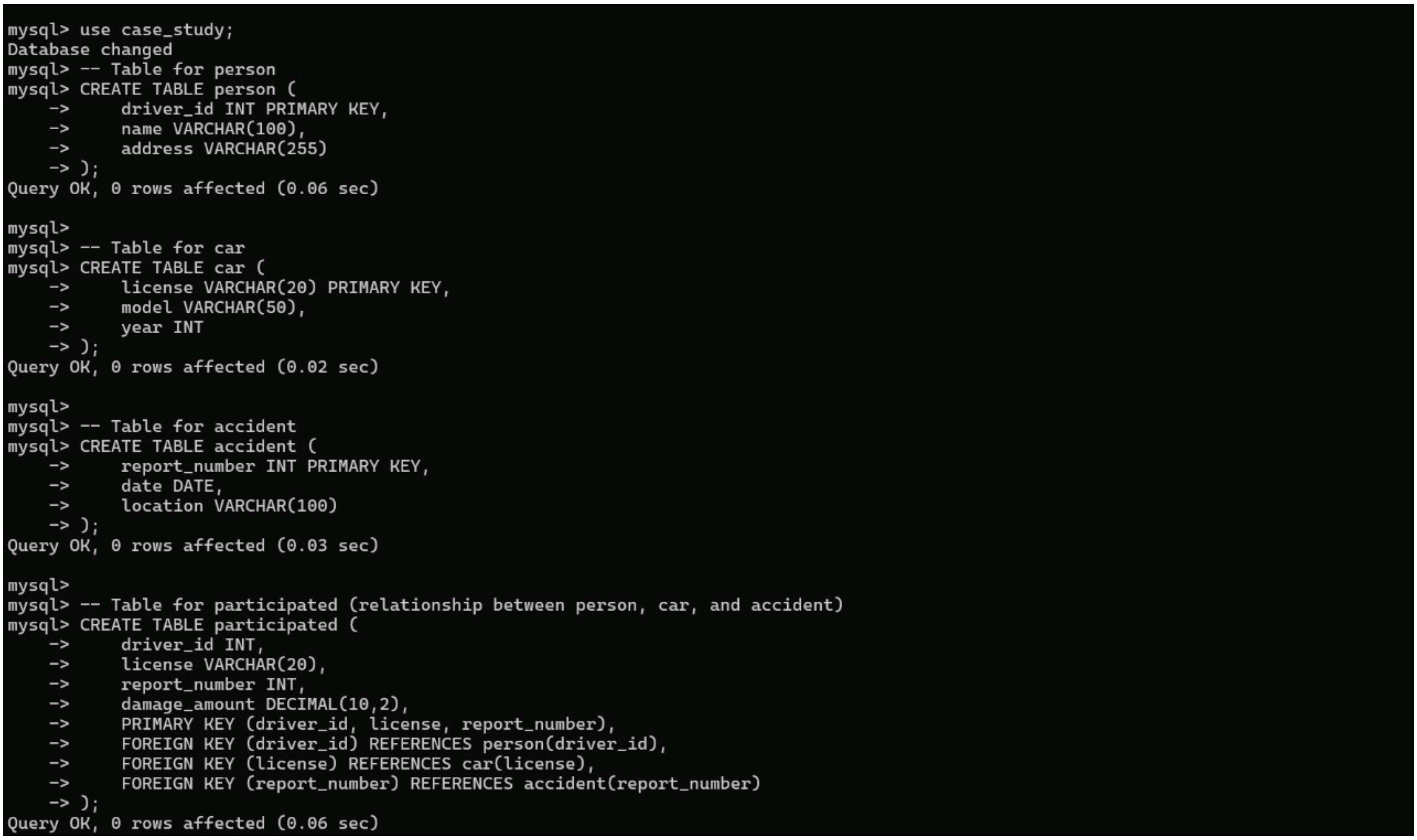
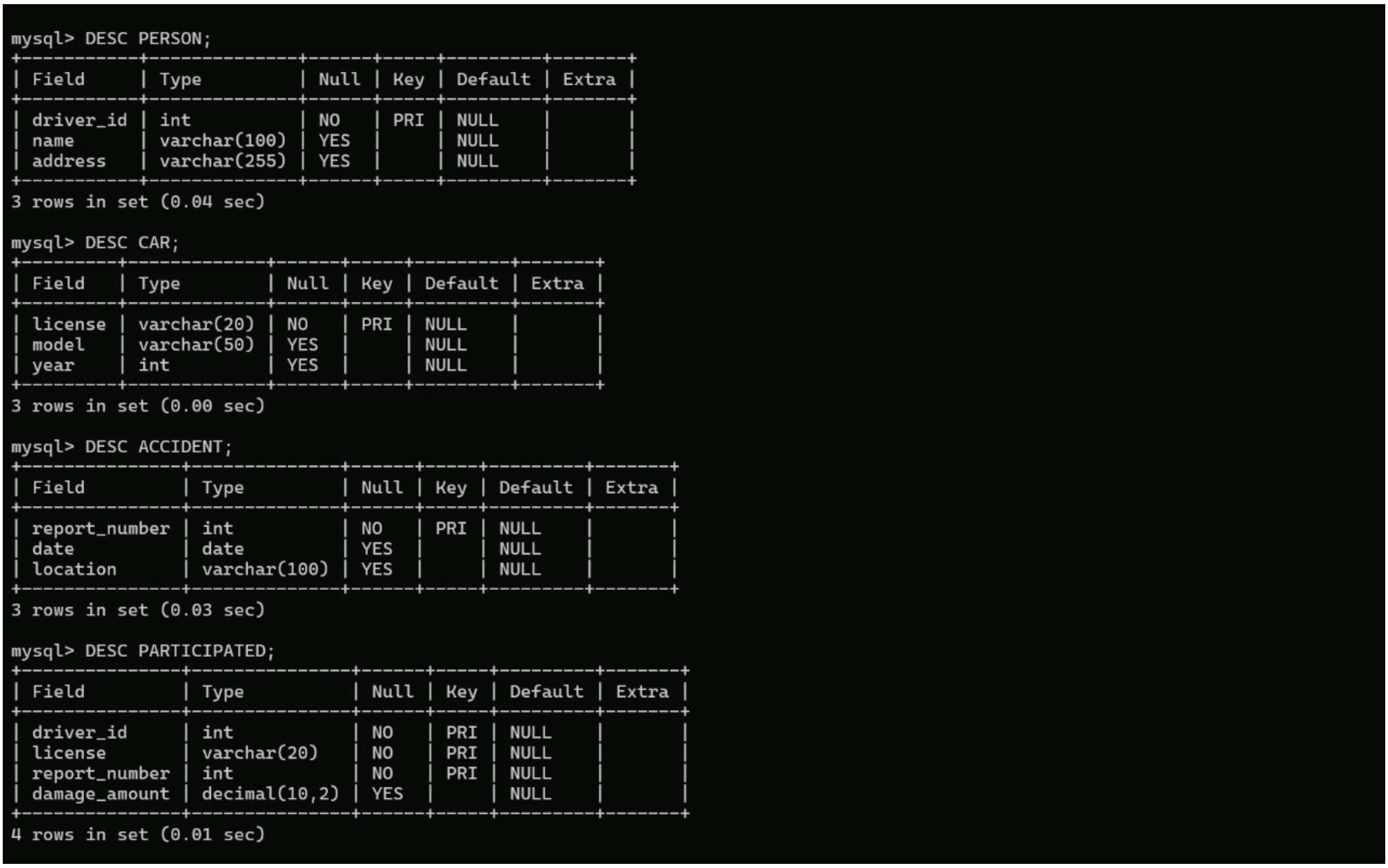
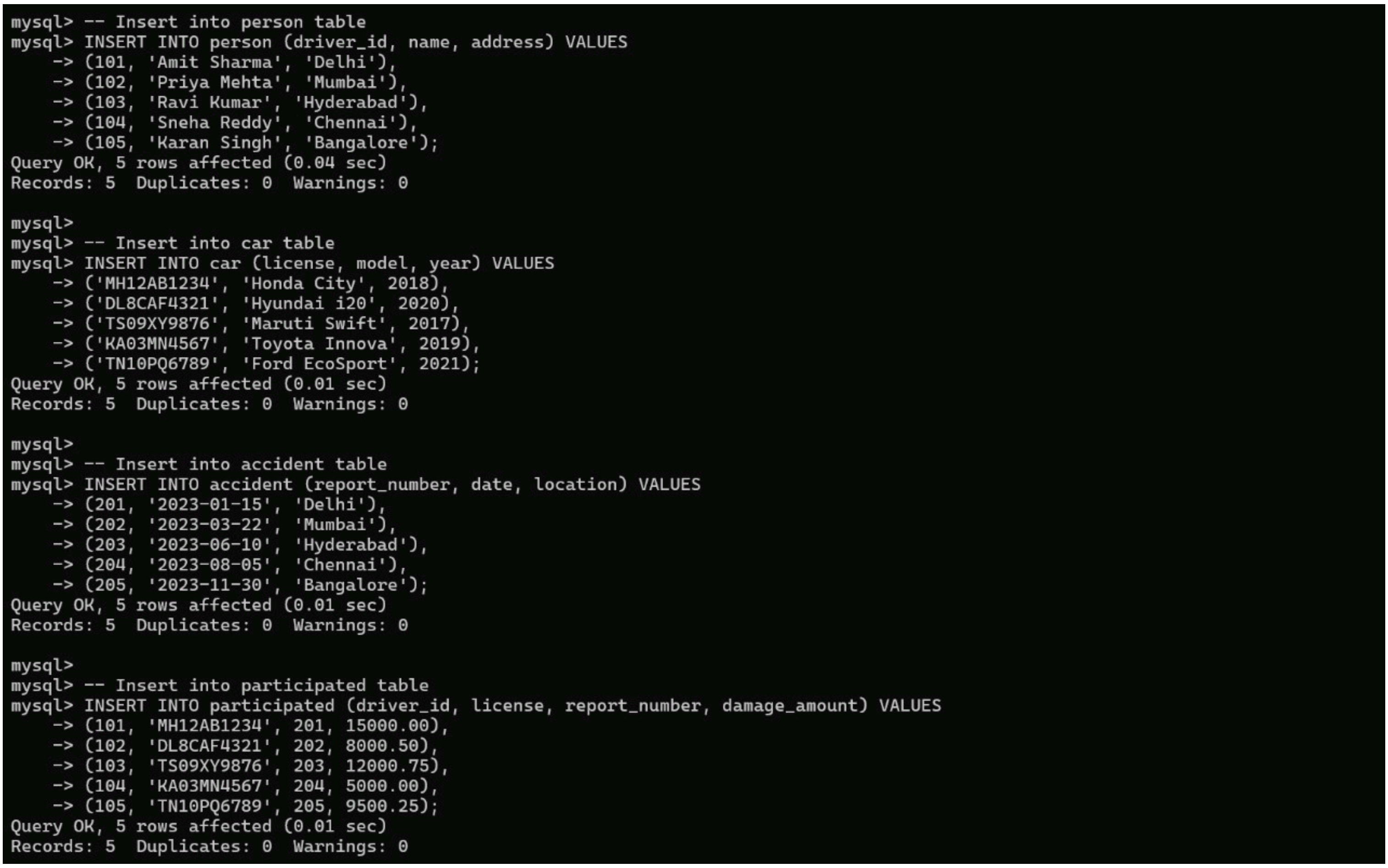

driver id
address
name
person
owns
model
year
license
car
report number
location
accident
date
participated
danage-
amount



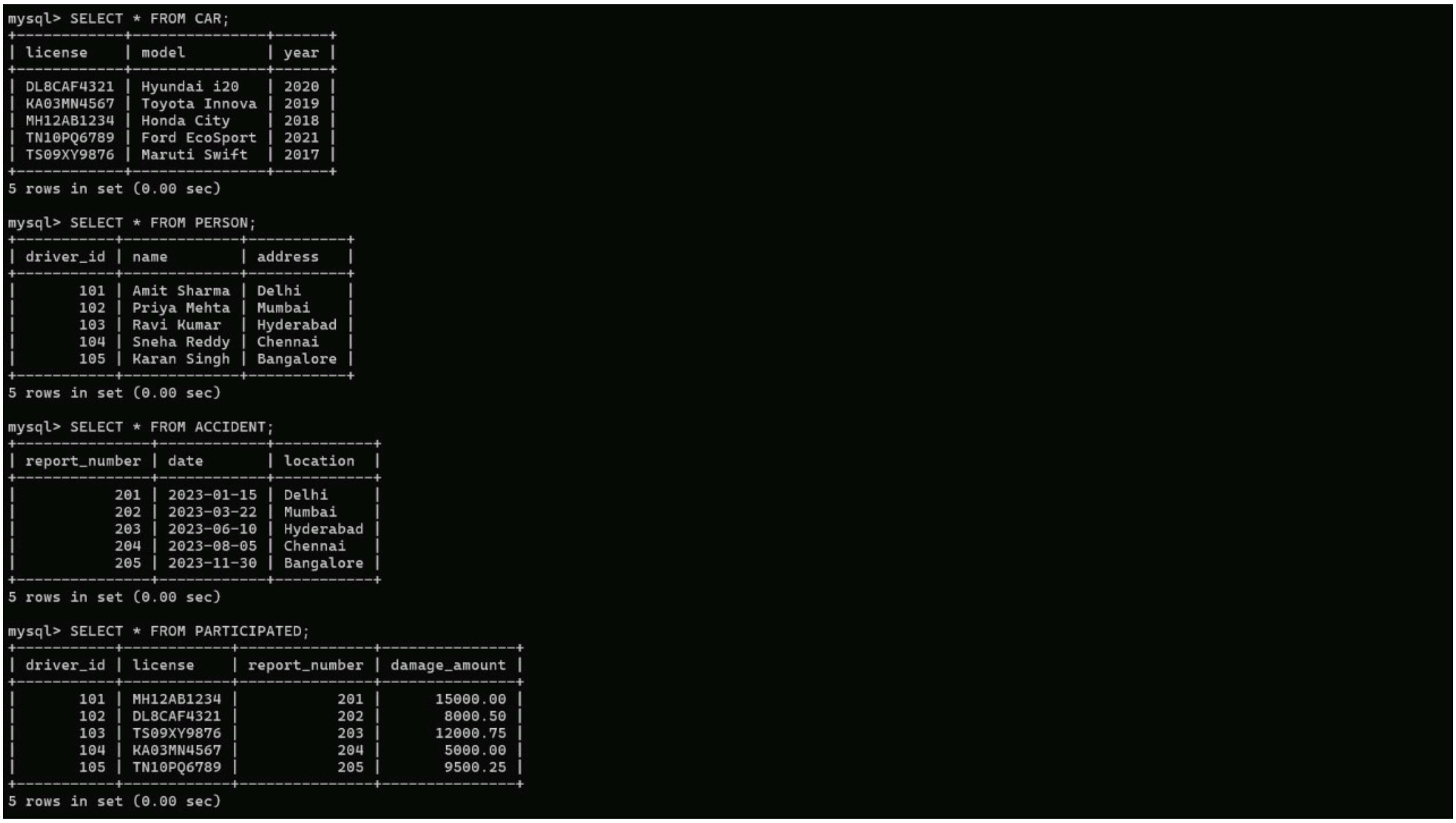
```
mysql> use case_study;
Database changed
mysql> -- Table for person
mysql> CREATE TABLE person (
    ->     driver_id INT PRIMARY KEY,
    ->     name VARCHAR(100),
    ->     address VARCHAR(255)
    -> );
Query OK, 0 rows affected (0.06 sec)

mysql>
mysql> -- Table for car
mysql> CREATE TABLE car (
    ->     license VARCHAR(20) PRIMARY KEY,
    ->     model VARCHAR(50),
    ->     year INT
    -> );
Query OK, 0 rows affected (0.02 sec)

mysql>
mysql> -- Table for accident
mysql> CREATE TABLE accident (
    ->     report_number INT PRIMARY KEY,
    ->     date DATE,
    ->     location VARCHAR(100)
    -> );
Query OK, 0 rows affected (0.03 sec)

mysql>
mysql> -- Table for participated (relationship between person, car, and accident)
mysql> CREATE TABLE participated (
    ->     driver_id INT,
    ->     license VARCHAR(20),
    ->     report_number INT,
    ->     damage_amount DECIMAL(10,2),
    ->     PRIMARY KEY (driver_id, license, report_number),
    ->     FOREIGN KEY (driver_id) REFERENCES person(driver_id),
    ->     FOREIGN KEY (license) REFERENCES car(license),
    ->     FOREIGN KEY (report_number) REFERENCES accident(report_number)
    -> );
Query OK, 0 rows affected (0.06 sec)
```



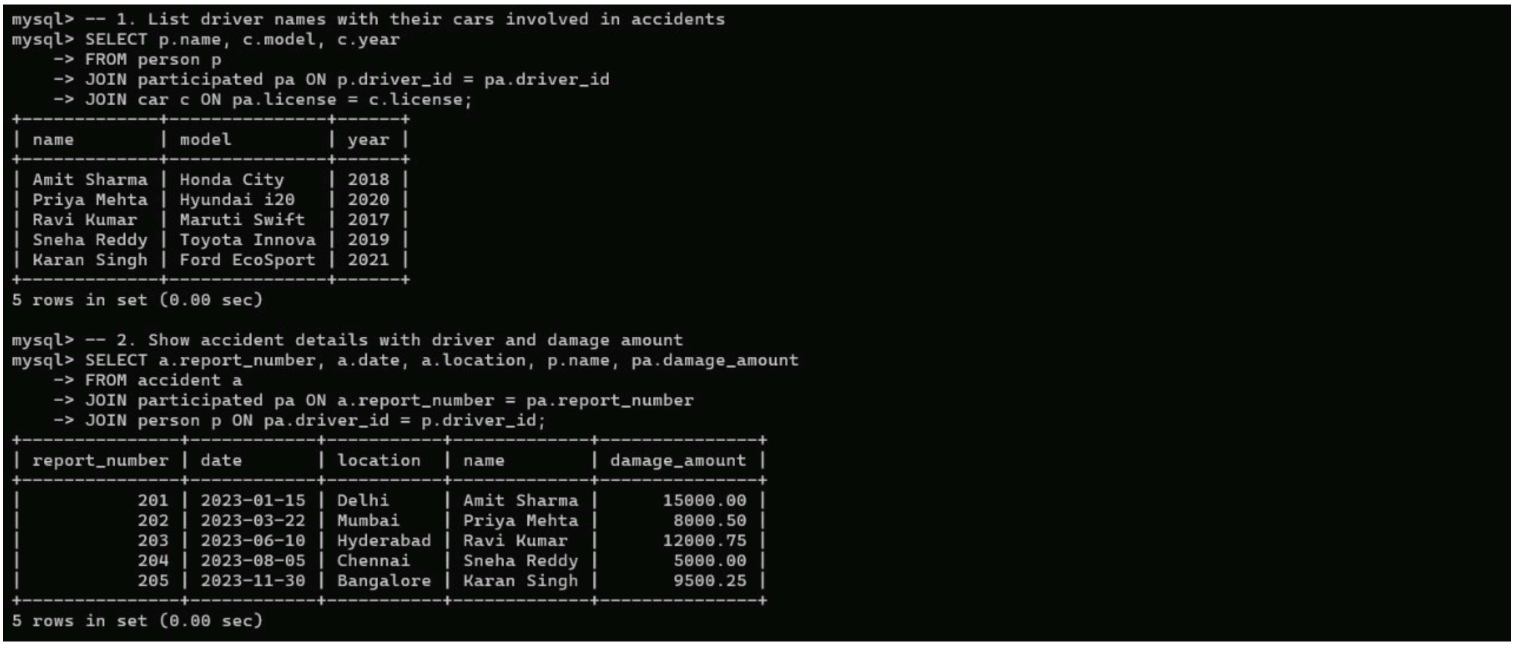
```
mysql> DESC PERSON;
+-----------+--------------+------+-----+---------+-------+
| Field     | Type         | Null | Key | Default | Extra |
+-----------+--------------+------+-----+---------+-------+
| driver_id | int          | NO   | PRI | NULL    |       |
| name      | varchar(100) | YES  |     | NULL    |       |
| address   | varchar(255) | YES  |     | NULL    |       |
+-----------+--------------+------+-----+---------+-------+
3 rows in set (0.04 sec)

mysql> DESC CAR;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| license | varchar(20) | NO   | PRI | NULL    |       |
| model   | varchar(50) | YES  |     | NULL    |       |
| year    | int         | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)

mysql> DESC ACCIDENT;
+---------------+--------------+------+-----+---------+-------+
| Field         | Type         | Null | Key | Default | Extra |
+---------------+--------------+------+-----+---------+-------+
| report_number | int          | NO   | PRI | NULL    |       |
| date          | date         | YES  |     | NULL    |       |
| location      | varchar(100) | YES  |     | NULL    |       |
+---------------+--------------+------+-----+---------+-------+
3 rows in set (0.03 sec)

mysql> DESC PARTICIPATED;
+---------------+---------------+------+-----+---------+-------+
| Field         | Type          | Null | Key | Default | Extra |
+---------------+---------------+------+-----+---------+-------+
| driver_id     | int           | NO   | PRI | NULL    |       |
| license       | varchar(20)   | NO   | PRI | NULL    |       |
| report_number | int           | NO   | PRI | NULL    |       |
| damage_amount | decimal(10,2) | YES  |     | NULL    |       |
+---------------+---------------+------+-----+---------+-------+
4 rows in set (0.01 sec)
```



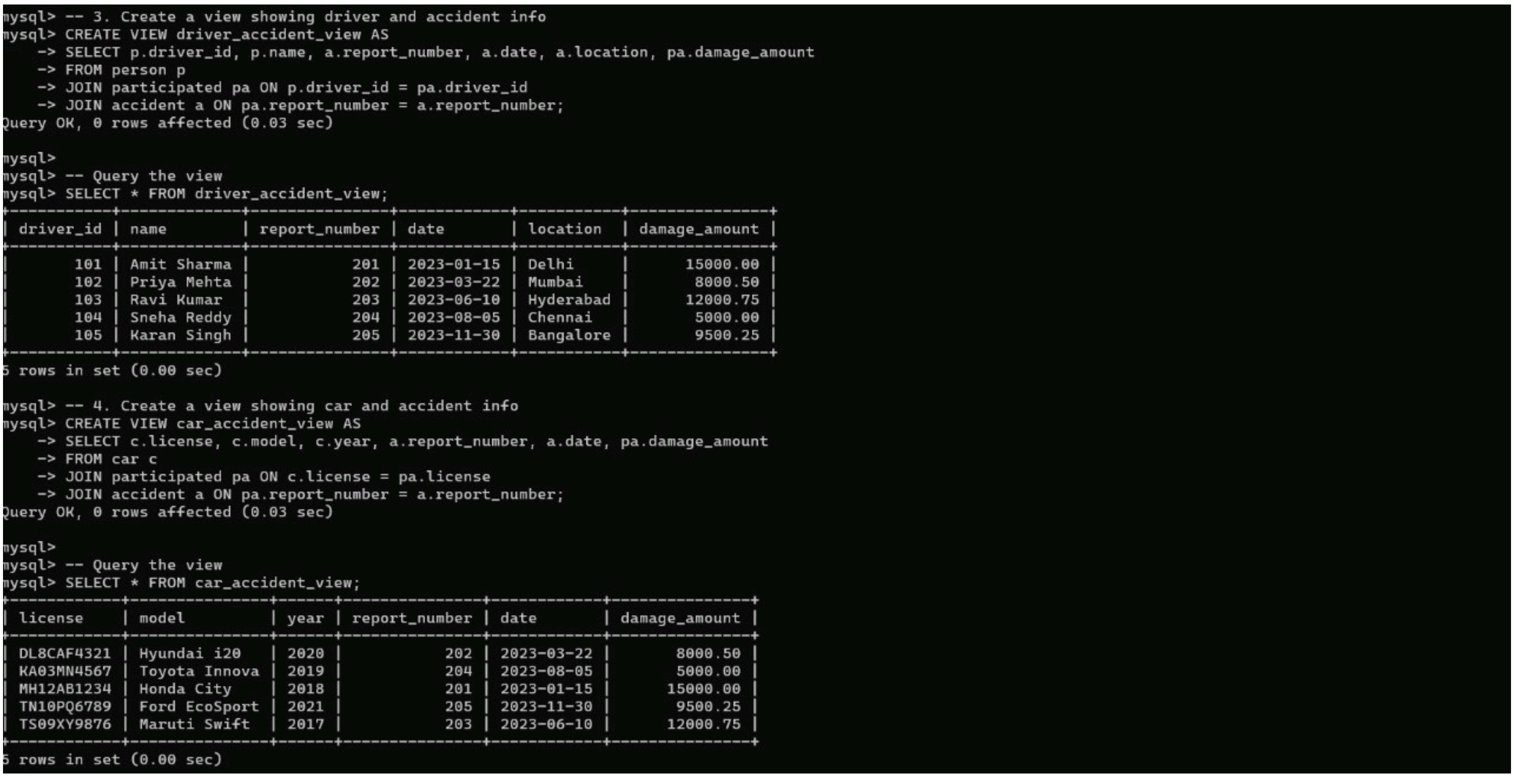
```
mysql> -- Insert into person table
mysql> INSERT INTO person (driver_id, name, address) VALUES
    -> (101, 'Amit Sharma', 'Delhi'),
    -> (102, 'Priya Mehta', 'Mumbai'),
    -> (103, 'Ravi Kumar', 'Hyderabad'),
    -> (104, 'Sneha Reddy', 'Chennai'),
    -> (105, 'Karan Singh', 'Bangalore');
Query OK, 5 rows affected (0.04 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql>
mysql> -- Insert into car table
mysql> INSERT INTO car (license, model, year) VALUES
    -> ('MH12AB1234', 'Honda City', 2018),
    -> ('DL8CAF4321', 'Hyundai i20', 2020),
    -> ('TS09XY9876', 'Maruti Swift', 2017),
    -> ('KA03MN4567', 'Toyota Innova', 2019),
    -> ('TN10PQ6789', 'Ford EcoSport', 2021);
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql>
mysql> -- Insert into accident table
mysql> INSERT INTO accident (report_number, date, location) VALUES
    -> (201, '2023-01-15', 'Delhi'),
    -> (202, '2023-03-22', 'Mumbai'),
    -> (203, '2023-06-10', 'Hyderabad'),
    -> (204, '2023-08-05', 'Chennai'),
    -> (205, '2023-11-30', 'Bangalore');
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql>
mysql> -- Insert into participated table
mysql> INSERT INTO participated (driver_id, license, report_number, damage_amount) VALUES
    -> (101, 'MH12AB1234', 201, 15000.00),
    -> (102, 'DL8CAF4321', 202, 8000.50),
    -> (103, 'TS09XY9876', 203, 12000.75),
    -> (104, 'KA03MN4567', 204, 5000.00),
    -> (105, 'TN10PQ6789', 205, 9500.25);
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0
```



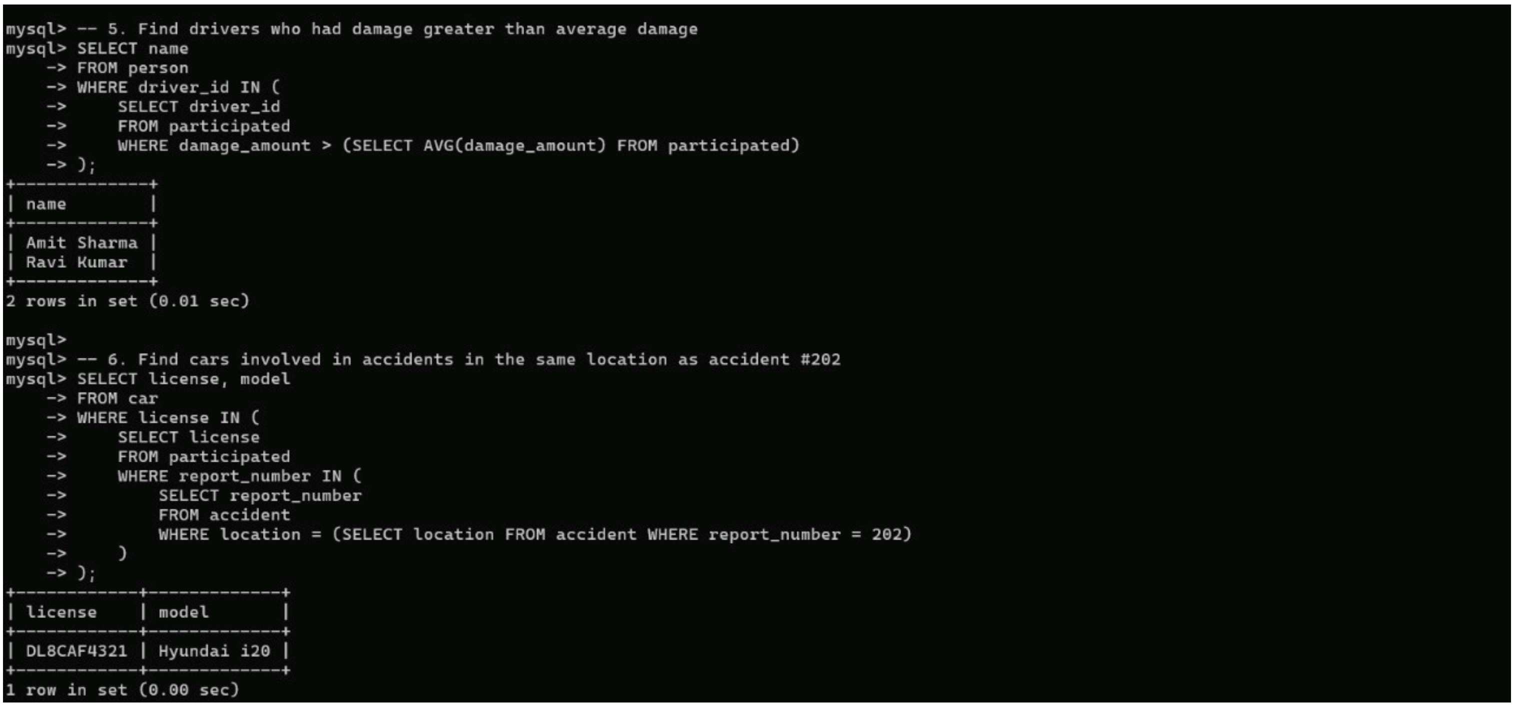
```
mysql> SELECT * FROM CAR;
+------------+---------------+------+
| license    | model         | year |
+------------+---------------+------+
| DL8CAF4321 | Hyundai i20   | 2020 |
| KA03MN4567 | Toyota Innova | 2019 |
| MH12AB1234 | Honda City    | 2018 |
| TN10PQ6789 | Ford EcoSport | 2021 |
| TS09XY9876 | Maruti Swift  | 2017 |
+------------+---------------+------+
5 rows in set (0.00 sec)

mysql> SELECT * FROM PERSON;
+-----------+-------------+-----------+
| driver_id | name        | address   |
+-----------+-------------+-----------+
|       101 | Amit Sharma | Delhi     |
|       102 | Priya Mehta | Mumbai    |
|       103 | Ravi Kumar  | Hyderabad |
|       104 | Sneha Reddy | Chennai   |
|       105 | Karan Singh | Bangalore |
+-----------+-------------+-----------+
5 rows in set (0.00 sec)

mysql> SELECT * FROM ACCIDENT;
+---------------+------------+-----------+
| report_number | date       | location  |
+---------------+------------+-----------+
|           201 | 2023-01-15 | Delhi     |
|           202 | 2023-03-22 | Mumbai    |
|           203 | 2023-06-10 | Hyderabad |
|           204 | 2023-08-05 | Chennai   |
|           205 | 2023-11-30 | Bangalore |
+---------------+------------+-----------+
5 rows in set (0.00 sec)

mysql> SELECT * FROM PARTICIPATED;
+-----------+------------+---------------+---------------+
| driver_id | license    | report_number | damage_amount |
+-----------+------------+---------------+---------------+
|       101 | MH12AB1234 |           201 |      15000.00 |
|       102 | DL8CAF4321 |           202 |       8000.50 |
|       103 | TS09XY9876 |           203 |      12000.75 |
|       104 | KA03MN4567 |           204 |       5000.00 |
|       105 | TN10PQ6789 |           205 |       9500.25 |
+-----------+------------+---------------+---------------+
5 rows in set (0.00 sec)
```



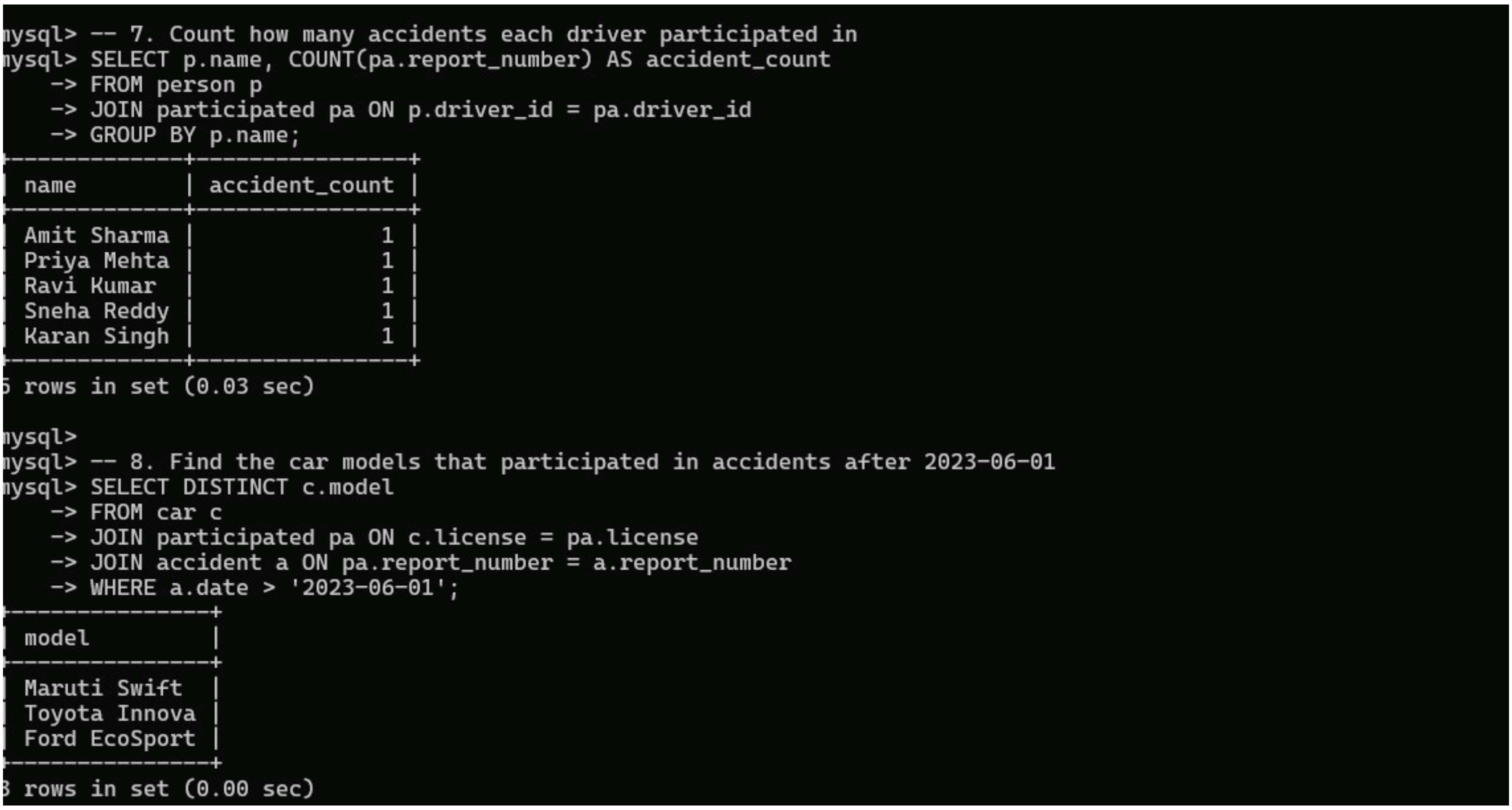
```
mysql> -- 1. List driver names with their cars involved in accidents
mysql> SELECT p.name, c.model, c.year
    -> FROM person p
    -> JOIN participated pa ON p.driver_id = pa.driver_id
    -> JOIN car c ON pa.license = c.license;
+-------------+---------------+------+
| name        | model         | year |
+-------------+---------------+------+
| Amit Sharma | Honda City    | 2018 |
| Priya Mehta | Hyundai i20   | 2020 |
| Ravi Kumar  | Maruti Swift  | 2017 |
| Sneha Reddy | Toyota Innova | 2019 |
| Karan Singh | Ford EcoSport | 2021 |
+-------------+---------------+------+
5 rows in set (0.00 sec)

mysql> -- 2. Show accident details with driver and damage amount
mysql> SELECT a.report_number, a.date, a.location, p.name, pa.damage_amount
    -> FROM accident a
    -> JOIN participated pa ON a.report_number = pa.report_number
    -> JOIN person p ON pa.driver_id = p.driver_id;
+---------------+------------+-----------+-------------+---------------+
| report_number | date       | location  | name        | damage_amount |
+---------------+------------+-----------+-------------+---------------+
|           201 | 2023-01-15 | Delhi     | Amit Sharma |      15000.00 |
|           202 | 2023-03-22 | Mumbai    | Priya Mehta |       8000.50 |
|           203 | 2023-06-10 | Hyderabad | Ravi Kumar  |      12000.75 |
|           204 | 2023-08-05 | Chennai   | Sneha Reddy |       5000.00 |
|           205 | 2023-11-30 | Bangalore | Karan Singh |       9500.25 |
+---------------+------------+-----------+-------------+---------------+
5 rows in set (0.00 sec)
```



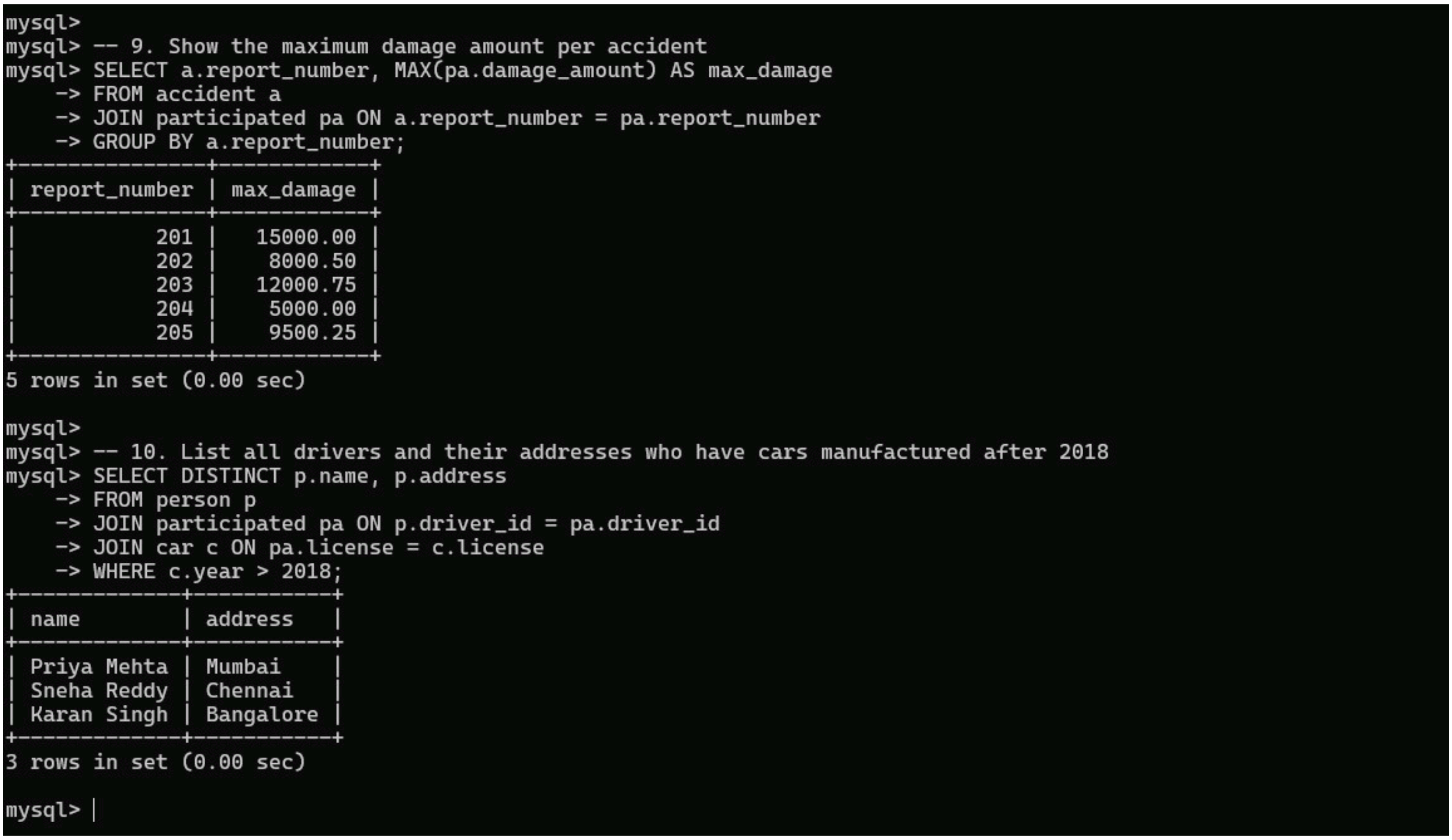
```
mysql> -- 3. Create a view showing driver and accident info
mysql> CREATE VIEW driver_accident_view AS
    -> SELECT p.driver_id, p.name, a.report_number, a.date, a.location, pa.damage_amount
    -> FROM person p
    -> JOIN participated pa ON p.driver_id = pa.driver_id
    -> JOIN accident a ON pa.report_number = a.report_number;
Query OK, 0 rows affected (0.03 sec)

mysql>
mysql> -- Query the view
mysql> SELECT * FROM driver_accident_view;
+-----------+-------------+---------------+------------+-----------+---------------+
| driver_id | name        | report_number | date       | location  | damage_amount |
+-----------+-------------+---------------+------------+-----------+---------------+
|       101 | Amit Sharma |           201 | 2023-01-15 | Delhi     |      15000.00 |
|       102 | Priya Mehta |           202 | 2023-03-22 | Mumbai    |       8000.50 |
|       103 | Ravi Kumar  |           203 | 2023-06-10 | Hyderabad |      12000.75 |
|       104 | Sneha Reddy |           204 | 2023-08-05 | Chennai   |       5000.00 |
|       105 | Karan Singh |           205 | 2023-11-30 | Bangalore |       9500.25 |
+-----------+-------------+---------------+------------+-----------+---------------+
5 rows in set (0.00 sec)

mysql> -- 4. Create a view showing car and accident info
mysql> CREATE VIEW car_accident_view AS
    -> SELECT c.license, c.model, c.year, a.report_number, a.date, pa.damage_amount
    -> FROM car c
    -> JOIN participated pa ON c.license = pa.license
    -> JOIN accident a ON pa.report_number = a.report_number;
Query OK, 0 rows affected (0.03 sec)

mysql>
mysql> -- Query the view
mysql> SELECT * FROM car_accident_view;
+------------+---------------+------+---------------+------------+---------------+
| license    | model         | year | report_number | date       | damage_amount |
+------------+---------------+------+---------------+------------+---------------+
| DL8CAF4321 | Hyundai i20   | 2020 |           202 | 2023-03-22 |       8000.50 |
| KA03MN4567 | Toyota Innova | 2019 |           204 | 2023-08-05 |       5000.00 |
| MH12AB1234 | Honda City    | 2018 |           201 | 2023-01-15 |      15000.00 |
| TN10PQ6789 | Ford EcoSport | 2021 |           205 | 2023-11-30 |       9500.25 |
| TS09XY9876 | Maruti Swift  | 2017 |           203 | 2023-06-10 |      12000.75 |
+------------+---------------+------+---------------+------------+---------------+
5 rows in set (0.00 sec)
```



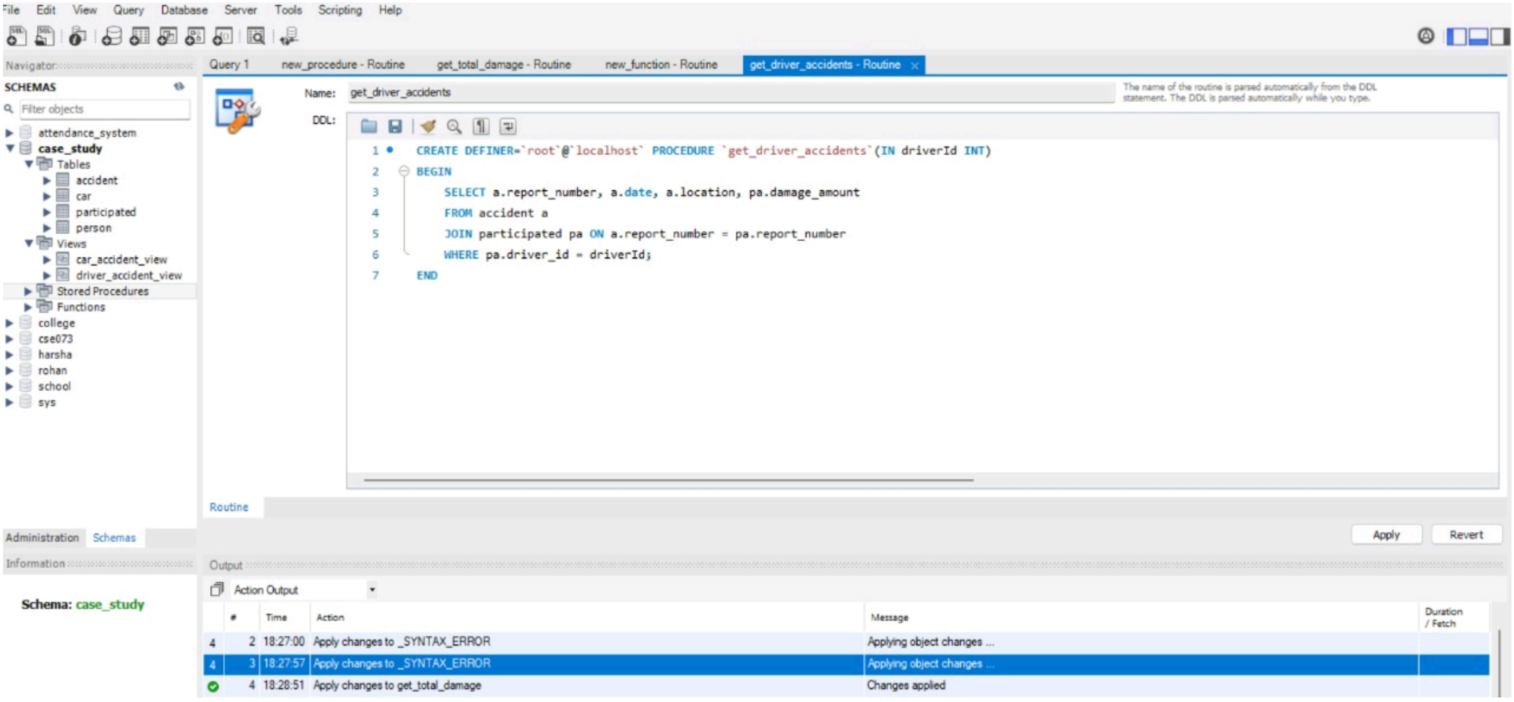
```
mysql> -- 5. Find drivers who had damage greater than average damage
mysql> SELECT name
    -> FROM person
    -> WHERE driver_id IN (
    ->     SELECT driver_id
    ->     FROM participated
    ->     WHERE damage_amount > (SELECT AVG(damage_amount) FROM participated)
    -> );
+-------------+
| name        |
+-------------+
| Amit Sharma |
| Ravi Kumar  |
+-------------+
2 rows in set (0.01 sec)

mysql>
mysql> -- 6. Find cars involved in accidents in the same location as accident #202
mysql> SELECT license, model
    -> FROM car
    -> WHERE license IN (
    ->     SELECT license
    ->     FROM participated
    ->     WHERE report_number IN (
    ->         SELECT report_number
    ->         FROM accident
    ->         WHERE location = (SELECT location FROM accident WHERE report_number = 202)
    ->     )
    -> );
+------------+-------------+
| license    | model       |
+------------+-------------+
| DL8CAF4321 | Hyundai i20 |
+------------+-------------+
1 row in set (0.00 sec)
```



```
mysql> -- 7. Count how many accidents each driver participated in
mysql> SELECT p.name, COUNT(pa.report_number) AS accident_count
    -> FROM person p
    -> JOIN participated pa ON p.driver_id = pa.driver_id
    -> GROUP BY p.name;
+-------------+----------------+
| name        | accident_count |
+-------------+----------------+
| Amit Sharma |              1 |
| Priya Mehta |              1 |
| Ravi Kumar  |              1 |
| Sneha Reddy |              1 |
| Karan Singh |              1 |
+-------------+----------------+
5 rows in set (0.03 sec)

mysql>
mysql> -- 8. Find the car models that participated in accidents after 2023-06-01
mysql> SELECT DISTINCT c.model
    -> FROM car c
    -> JOIN participated pa ON c.license = pa.license
    -> JOIN accident a ON pa.report_number = a.report_number
    -> WHERE a.date > '2023-06-01';
+---------------+
| model         |
+---------------+
| Maruti Swift  |
| Toyota Innova |
| Ford EcoSport |
+---------------+
3 rows in set (0.00 sec)
```



```
mysql>
mysql> -- 9. Show the maximum damage amount per accident
mysql> SELECT a.report_number, MAX(pa.damage_amount) AS max_damage
    -> FROM accident a
    -> JOIN participated pa ON a.report_number = pa.report_number
    -> GROUP BY a.report_number;
+---------------+------------+
| report_number | max_damage |
+---------------+------------+
|           201 |   15000.00 |
|           202 |    8000.50 |
|           203 |   12000.75 |
|           204 |    5000.00 |
|           205 |    9500.25 |
+---------------+------------+
5 rows in set (0.00 sec)

mysql>
mysql> -- 10. List all drivers and their addresses who have cars manufactured after 2018
mysql> SELECT DISTINCT p.name, p.address
    -> FROM person p
    -> JOIN participated pa ON p.driver_id = pa.driver_id
    -> JOIN car c ON pa.license = c.license
    -> WHERE c.year > 2018;
+-------------+-----------+
| name        | address   |
+-------------+-----------+
| Priya Mehta | Mumbai    |
| Sneha Reddy | Chennai   |
| Karan Singh | Bangalore |
+-------------+-----------+
3 rows in set (0.00 sec)

mysql> |
```



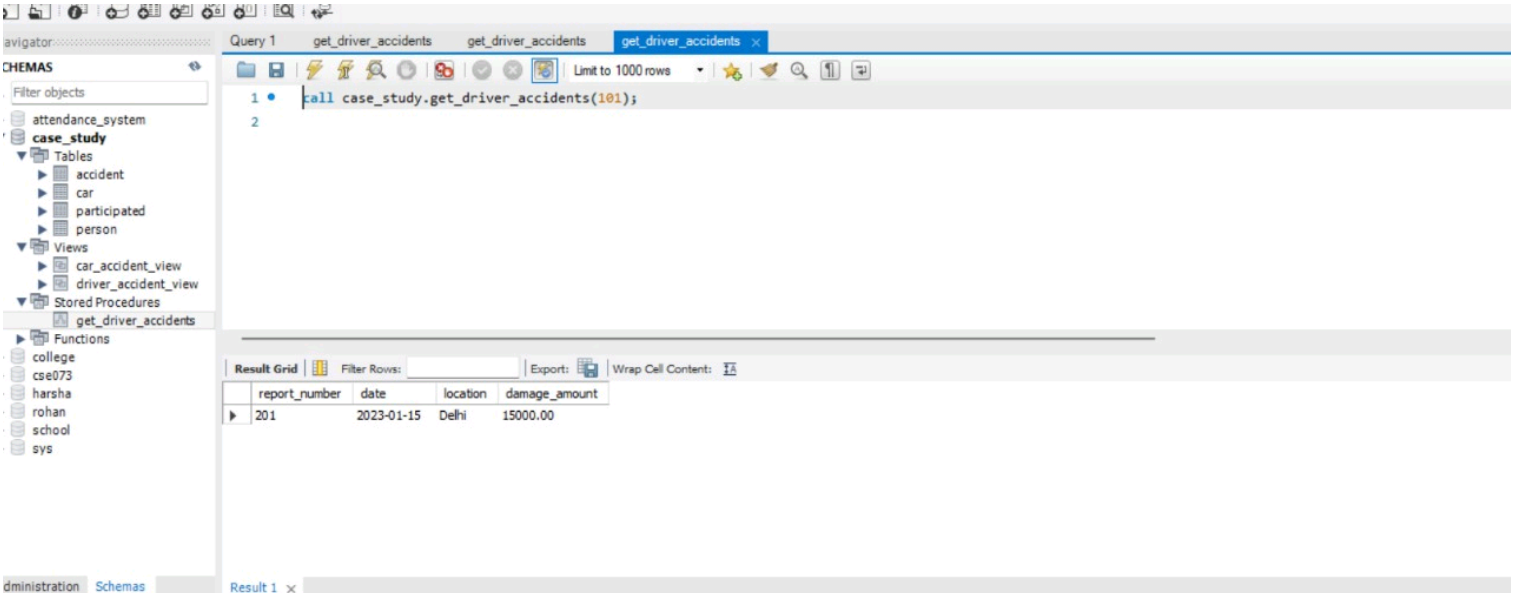
Name: get_driver_accidents

The name of the routine is parsed automatically from the DDL statement. The DDL is parsed automatically while you type.

DDL:

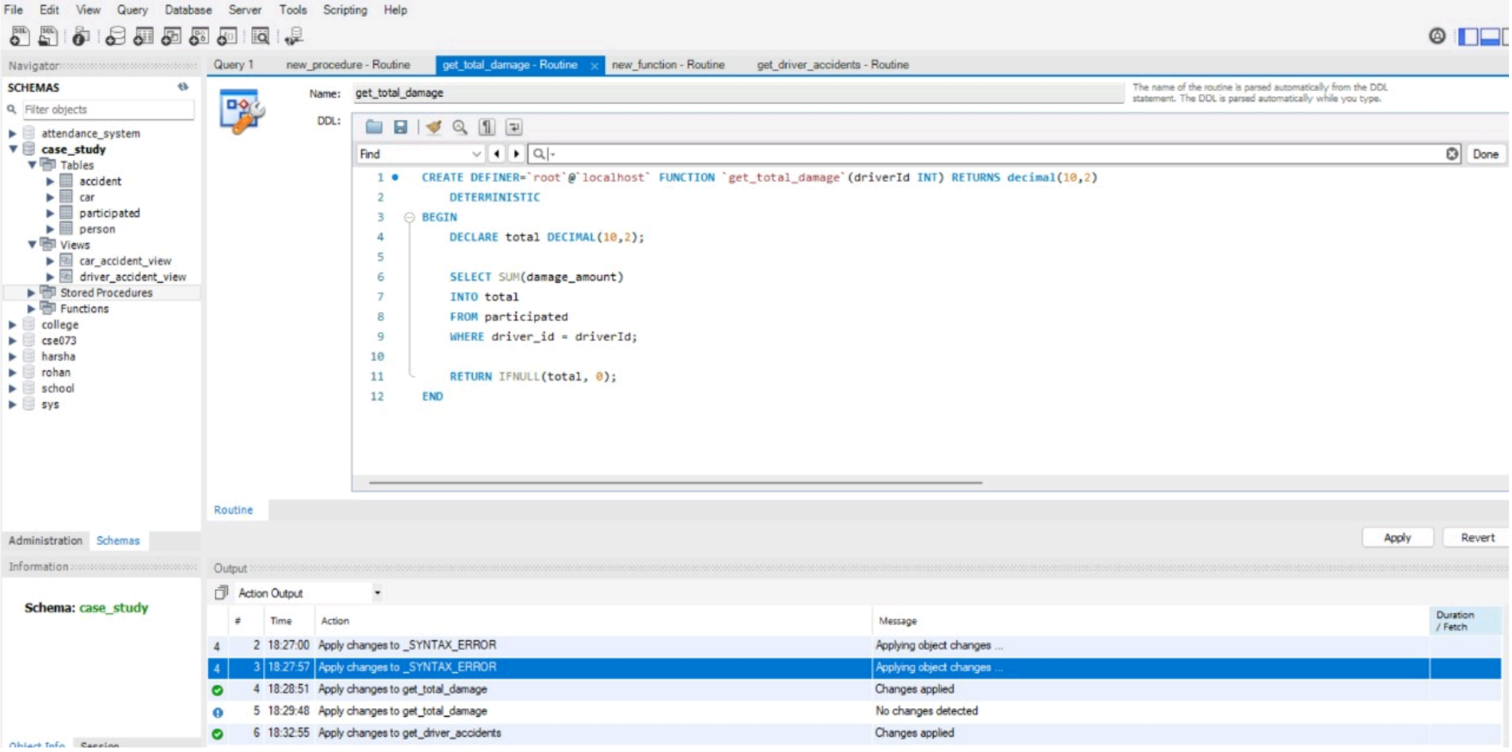
```sql
CREATE DEFINER=`root`@`localhost` PROCEDURE `get_driver_accidents`(IN driverId INT)
BEGIN
    SELECT a.report_number, a.date, a.location, pa.damage_amount
    FROM accident a
    JOIN participated pa ON a.report_number = pa.report_number
    WHERE pa.driver_id = driverId;
END
```

	#	Time	Action	Message	Duration / Fetch
4	2	18:27:00	Apply changes to _SYNTAX_ERROR	Applying object changes ...	
4	3	18:27:57	Apply changes to _SYNTAX_ERROR	Applying object changes ...	
✓	4	18:28:51	Apply changes to get_total_damage	Changes applied	



```
call case_study.get_driver_accidents(101);
```

report_number	date	location	damage_amount
201	2023-01-15	Delhi	15000.00



Name: get_total_damage

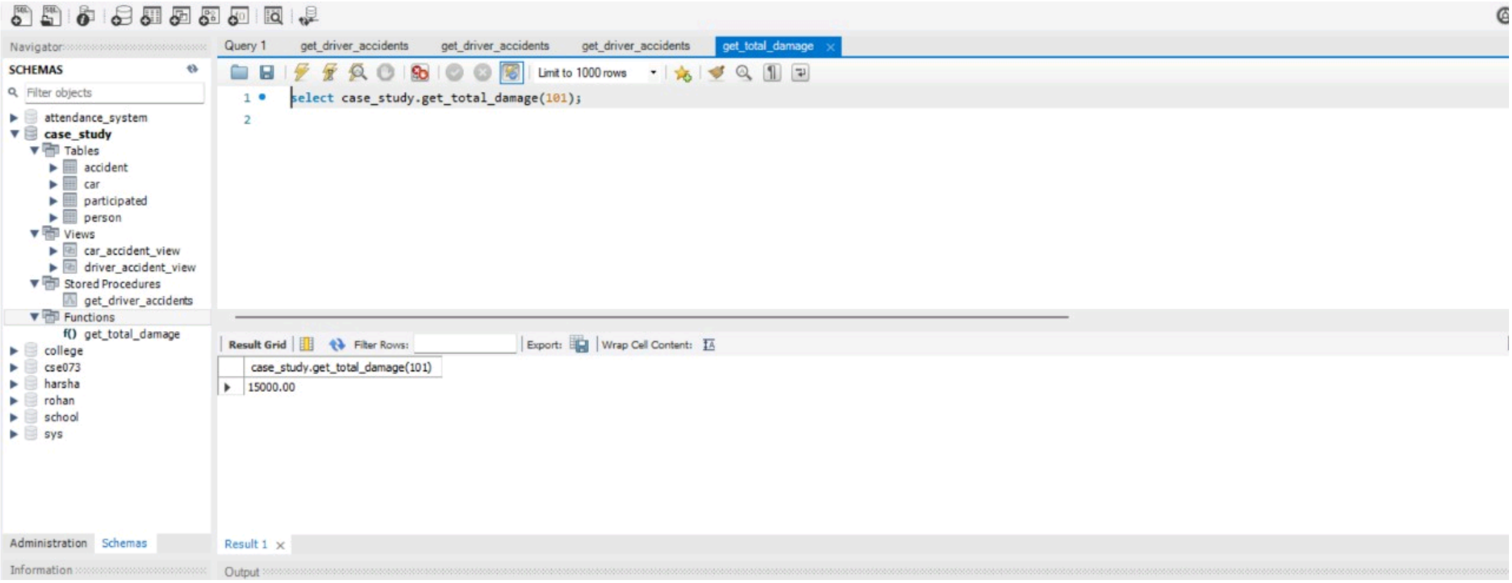
The name of the routine is parsed automatically from the DDL statement. The DDL is parsed automatically while you type.

DDL:

```sql
CREATE DEFINER=`root`@`localhost` FUNCTION `get_total_damage`(driverId INT) RETURNS decimal(10,2)
    DETERMINISTIC
BEGIN
    DECLARE total DECIMAL(10,2);

    SELECT SUM(damage_amount)
    INTO total
    FROM participated
    WHERE driver_id = driverId;

    RETURN IFNULL(total, 0);
END
```

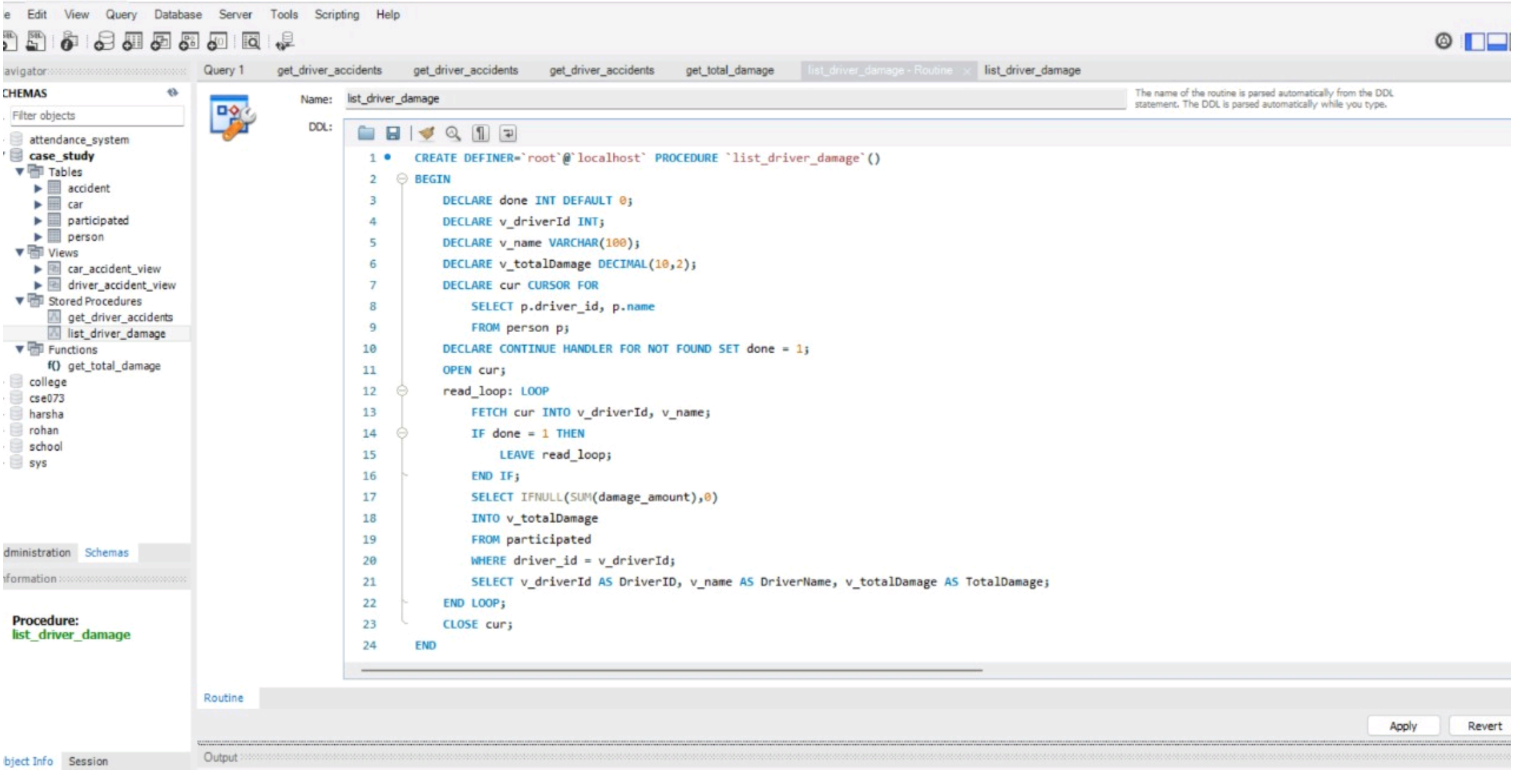
Schema: case_study

	#	Time	Action	Message	Duration / Fetch
4	2	18:27:00	Apply changes to _SYNTAX_ERROR	Applying object changes ...	
4	3	18:27:57	Apply changes to _SYNTAX_ERROR	Applying object changes ...	
✓	4	18:28:51	Apply changes to get_total_damage	Changes applied	
ℹ	5	18:29:48	Apply changes to get_total_damage	No changes detected	
✓	6	18:32:55	Apply changes to get_driver_accidents	Changes applied	



```
select case_study.get_total_damage(101);
```

case_study.get_total_damage(101)
15000.00



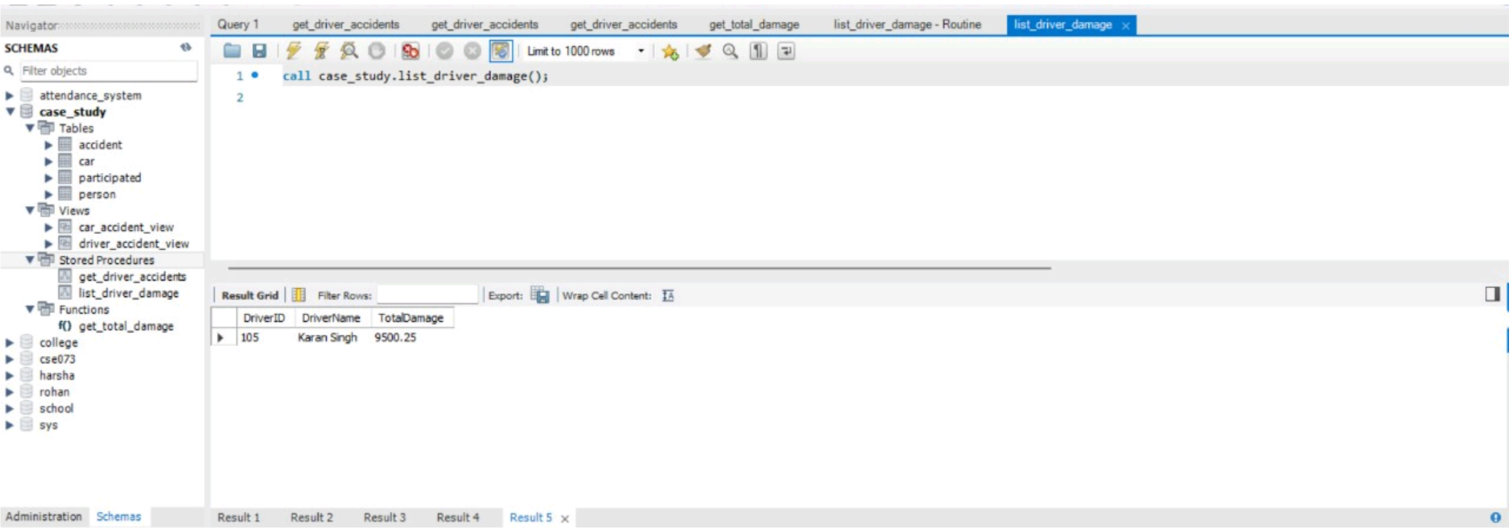
Procedure:
list_driver_damage

Name: list_driver_damage

The name of the routine is parsed automatically from the DDL statement. The DDL is parsed automatically while you type.

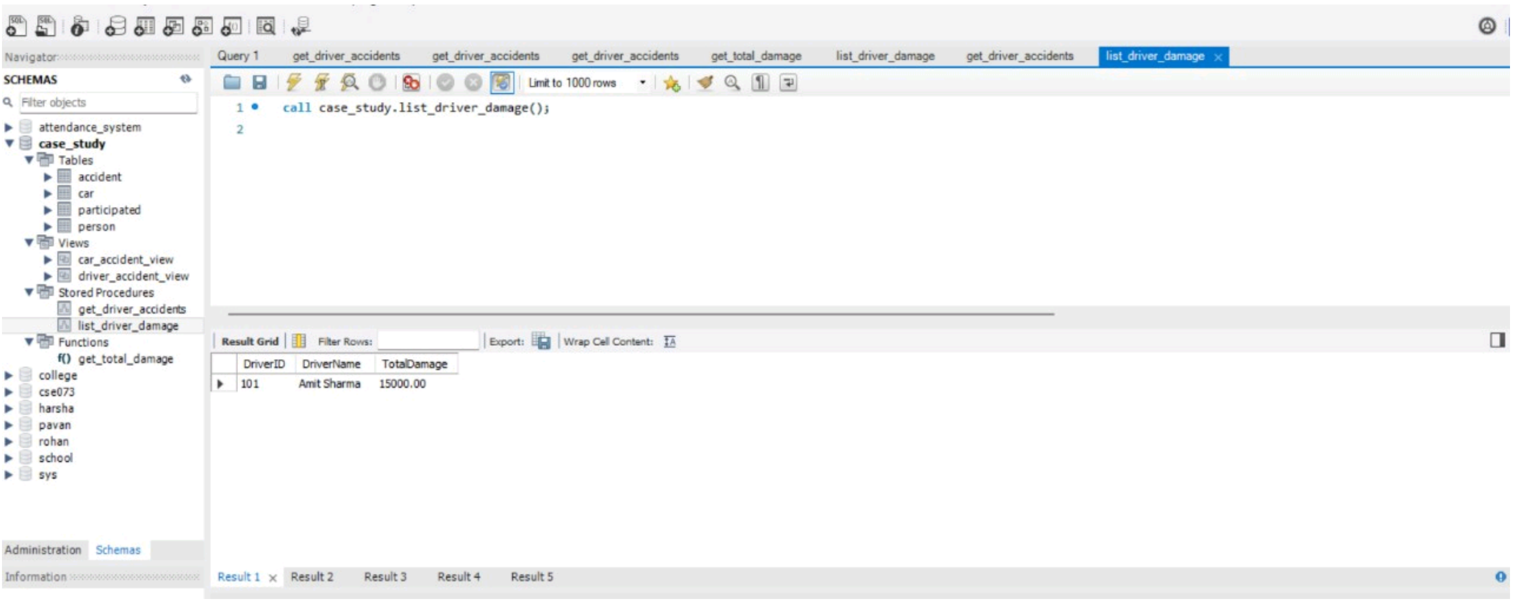
DDL:

```sql
CREATE DEFINER=`root`@`localhost` PROCEDURE `list_driver_damage`()
BEGIN
    DECLARE done INT DEFAULT 0;
    DECLARE v_driverId INT;
    DECLARE v_name VARCHAR(100);
    DECLARE v_totalDamage DECIMAL(10,2);
    DECLARE cur CURSOR FOR
        SELECT p.driver_id, p.name
        FROM person p;
    DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = 1;
    OPEN cur;
    read_loop: LOOP
        FETCH cur INTO v_driverId, v_name;
        IF done = 1 THEN
            LEAVE read_loop;
        END IF;
        SELECT IFNULL(SUM(damage_amount),0)
        INTO v_totalDamage
        FROM participated
        WHERE driver_id = v_driverId;
        SELECT v_driverId AS DriverID, v_name AS DriverName, v_totalDamage AS TotalDamage;
    END LOOP;
    CLOSE cur;
END
```



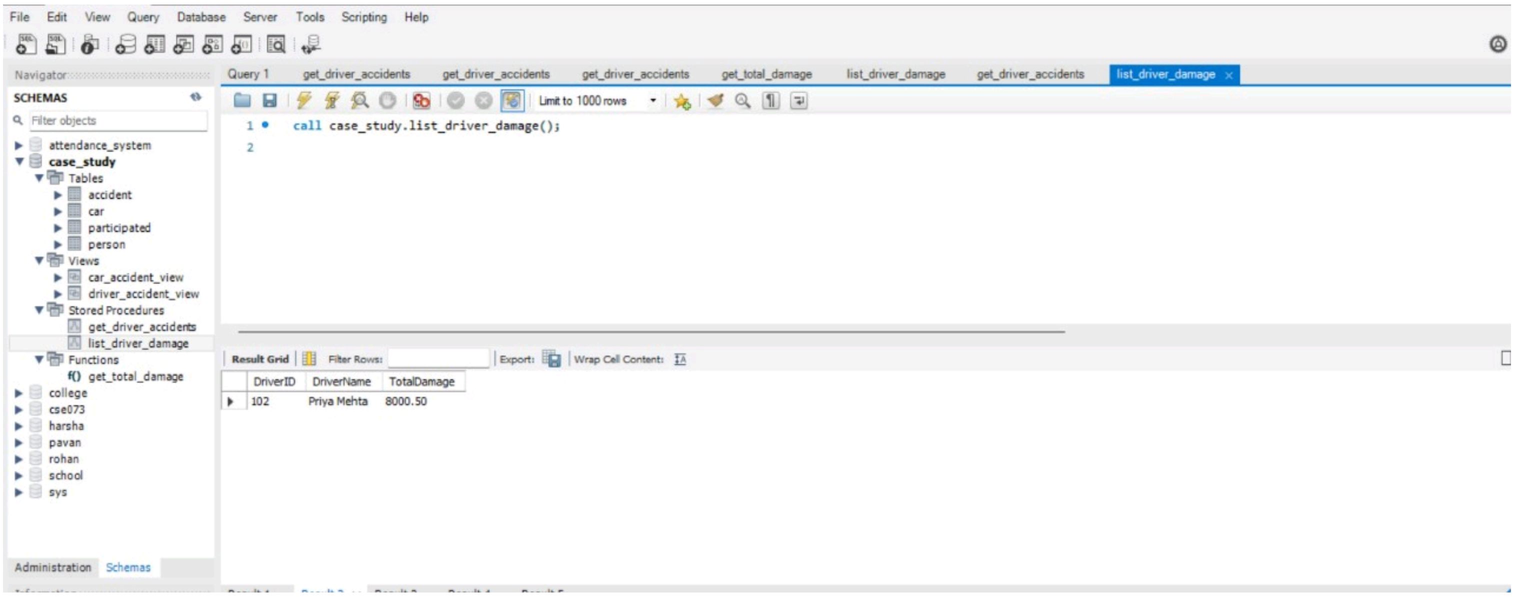
```
call case_study.list_driver_damage();
```

DriverID	DriverName	TotalDamage
105	Karan Singh	9500.25



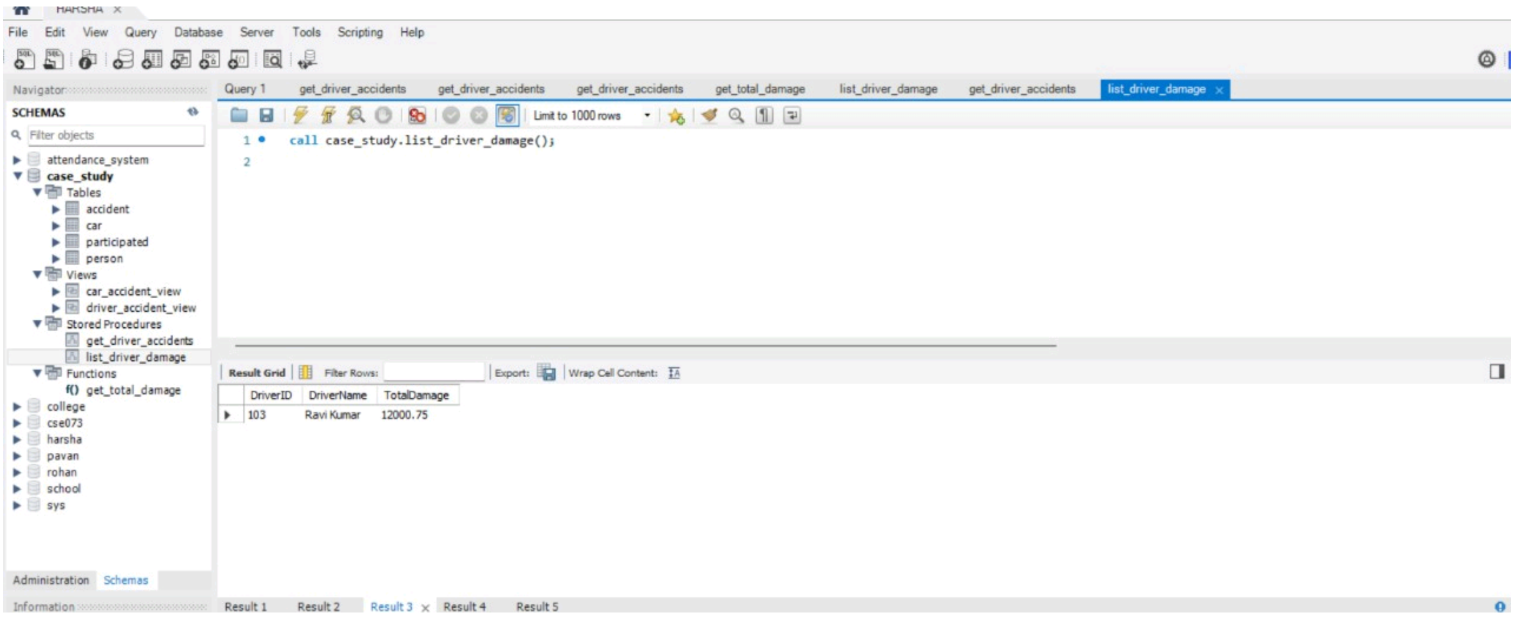
```
call case_study.list_driver_damage();
```

DriverID	DriverName	TotalDamage
101	Amit Sharma	15000.00



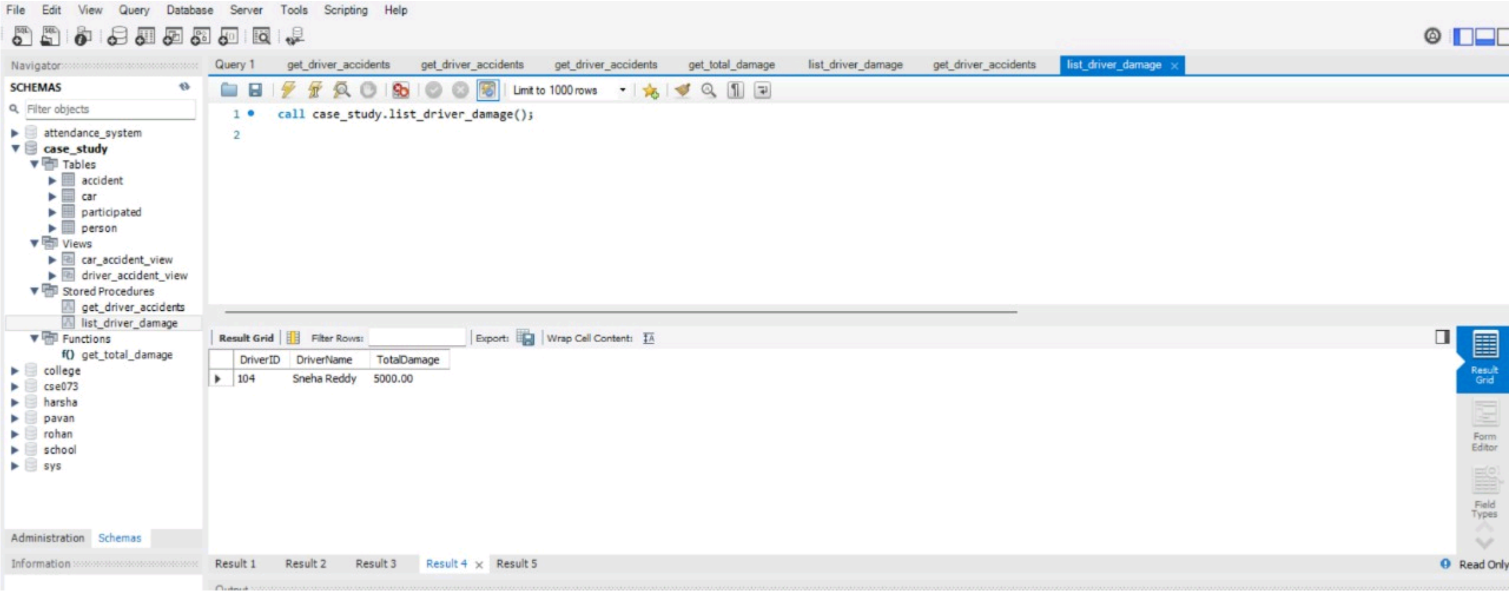
```
call case_study.list_driver_damage();
```

DriverID	DriverName	TotalDamage
102	Priya Mehta	8000.50



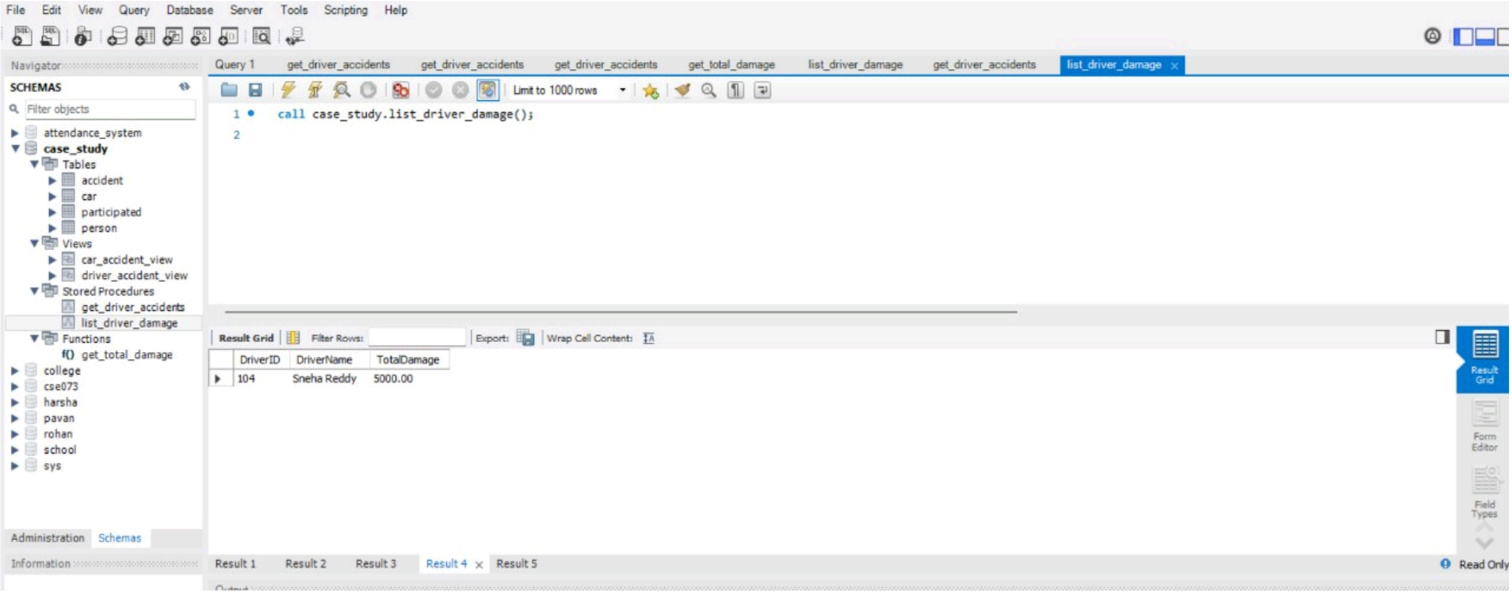
```
call case_study.list_driver_damage();
```

DriverID	DriverName	TotalDamage
103	Ravi Kumar	12000.75



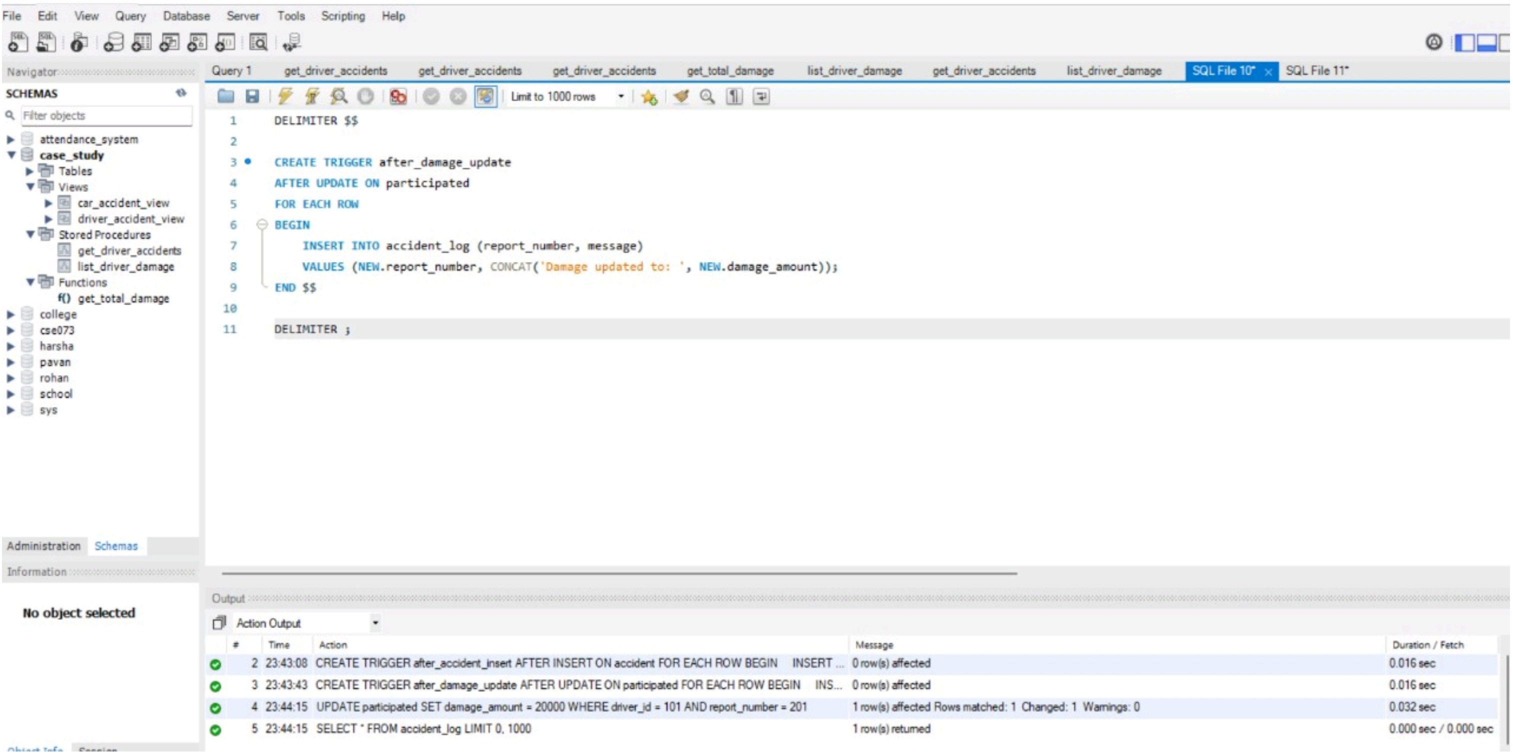
```
call case_study.list_driver_damage();
```

DriverID	DriverName	TotalDamage
104	Sneha Reddy	5000.00



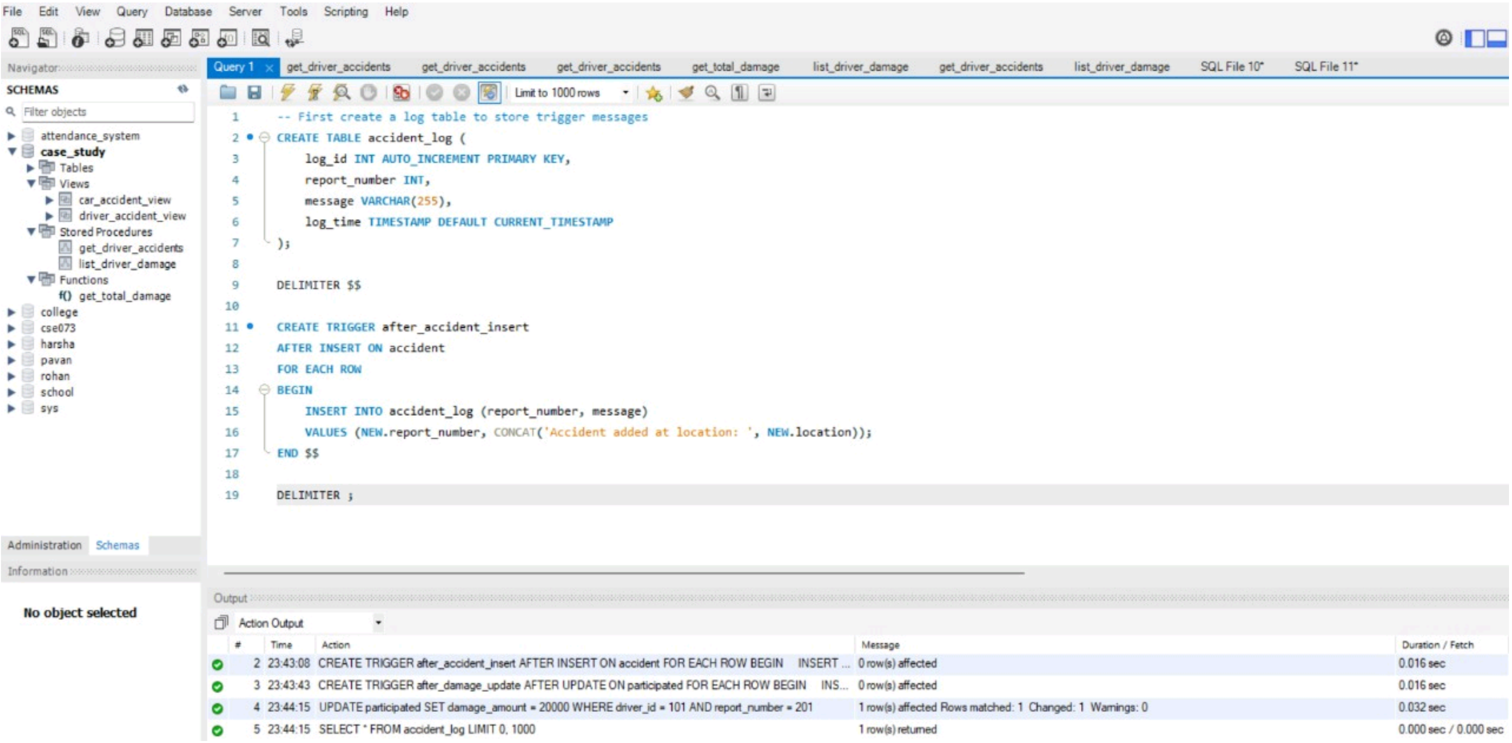
```
call case_study.list_driver_damage();
```

DriverID	DriverName	TotalDamage
104	Sneha Reddy	5000.00



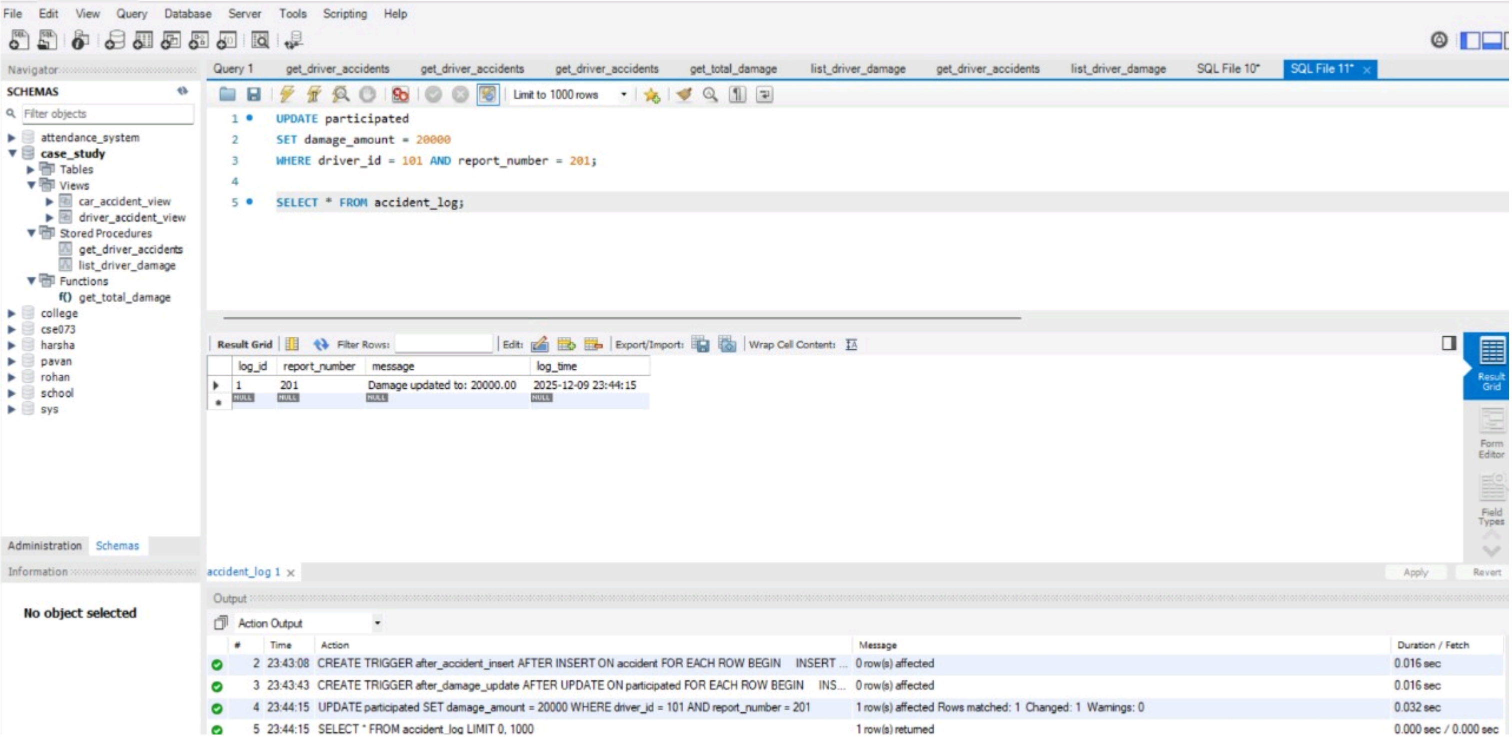
```
DELIMITER $$

CREATE TRIGGER after_damage_update
AFTER UPDATE ON participated
FOR EACH ROW
BEGIN
    INSERT INTO accident_log (report_number, message)
    VALUES (NEW.report_number, CONCAT('Damage updated to: ', NEW.damage_amount));
END $$

DELIMITER ;
```

	#	Time	Action	Message	Duration / Fetch
✓	2	23:43:08	CREATE TRIGGER after_accident_insert AFTER INSERT ON accident FOR EACH ROW BEGIN INSERT ...	0 row(s) affected	0.016 sec
✓	3	23:43:43	CREATE TRIGGER after_damage_update AFTER UPDATE ON participated FOR EACH ROW BEGIN INS...	0 row(s) affected	0.016 sec
✓	4	23:44:15	UPDATE participated SET damage_amount = 20000 WHERE driver_id = 101 AND report_number = 201	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0	0.032 sec
✓	5	23:44:15	SELECT * FROM accident_log LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec



```sql
-- First create a log table to store trigger messages
CREATE TABLE accident_log (
    log_id INT AUTO_INCREMENT PRIMARY KEY,
    report_number INT,
    message VARCHAR(255),
    log_time TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);

DELIMITER $$

CREATE TRIGGER after_accident_insert
AFTER INSERT ON accident
FOR EACH ROW
BEGIN
    INSERT INTO accident_log (report_number, message)
    VALUES (NEW.report_number, CONCAT('Accident added at location: ', NEW.location));
END $$

DELIMITER ;
```

#	Time	Action	Message	Duration / Fetch
2	23:43:08	CREATE TRIGGER after_accident_insert AFTER INSERT ON accident FOR EACH ROW BEGIN INSERT ...	0 row(s) affected	0.016 sec
3	23:43:43	CREATE TRIGGER after_damage_update AFTER UPDATE ON participated FOR EACH ROW BEGIN INS...	0 row(s) affected	0.016 sec
4	23:44:15	UPDATE participated SET damage_amount = 20000 WHERE driver_id = 101 AND report_number = 201	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0	0.032 sec
5	23:44:15	SELECT * FROM accident_log LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec



```sql
UPDATE participated
SET damage_amount = 20000
WHERE driver_id = 101 AND report_number = 201;

SELECT * FROM accident_log;
```

log_id	report_number	message	log_time
1	201	Damage updated to: 20000.00	2025-12-09 23:44:15
NULL	NULL	NULL	NULL

#	Time	Action	Message	Duration / Fetch
2	23:43:08	CREATE TRIGGER after_accident_insert AFTER INSERT ON accident FOR EACH ROW BEGIN INSERT ...	0 row(s) affected	0.016 sec
3	23:43:43	CREATE TRIGGER after_damage_update AFTER UPDATE ON participated FOR EACH ROW BEGIN INS...	0 row(s) affected	0.016 sec
4	23:44:15	UPDATE participated SET damage_amount = 20000 WHERE driver_id = 101 AND report_number = 201	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0	0.032 sec
5	23:44:15	SELECT * FROM accident_log LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec