Database for renting houses, apartments, and rooms

Requirements specification and analysis

Main Roles (User groups):

1. The host offers their properties for rent.
2. The guest makes reservation and payment.
3. The market as a connection between the host and the guest, where all transections happen like property offering for rent, reservation, payments, cancellation, commission charges etc.

The entities in the database are:

property: each property has at least one room but can be multiple rooms. Property availability depends on the room availability column.

host: each host can own at least one property, but each host can have multiple properties. The host can be related to one or many reservations.

property_type: each type has properties. Each property has a type.

room: each room is part of the property. Each property has at least one room. The guest can reserve the room that belongs to the property, through the reservation in the market. By default, room_availability is TRUE. But if it is reserved, room_availability will be FALSE.

room_type: each type has rooms. Each room has a type

property_commission: each property has its own commission percentage charged by the market, based on the contract between the host and the market.

facility: each property has its own facilities, such as parking, pool, etc.

amenities: each room has its own list of amenities, such as Wi-Fi, heating, TV, hair dryer, towel, soap, shampoo, etc.

country: each country has number of cities. Each city located in one country.

city: each city located in one country. Each country has number of cities.

neighborhood: each neighborhood has many properties. Each property is in one neighborhood.

property_review: the guest can only review the property if in payment table, payment_date is NOT NULL. If the average review of a property is less than a specific threshold or below the minimum standard rate, the property can be removed, because it will affect the image of the market.

guest_review: the host can also rate the guest from 1 to 5. (1 = Very Bad, 2 = Bad, 3 = Okay, 4 = Good, 5 = Excellent). If average review of guest less than 3, guest can be banned by the market.

guest_commission: in addition to taking commission from the host, the market takes the commission from the guest.

guest: guest belongs to guest_level. This level can be increased with rating.

reservation: the reservation table is the heart of this service. It has relationship with guest, room, payment, cancellation, property_review. Not all reservations will go to the payment. Some of them will go to the cancellation.

voucher: vouchers may be offered as promotions for certain guests or locations, related to advertisement campaign.

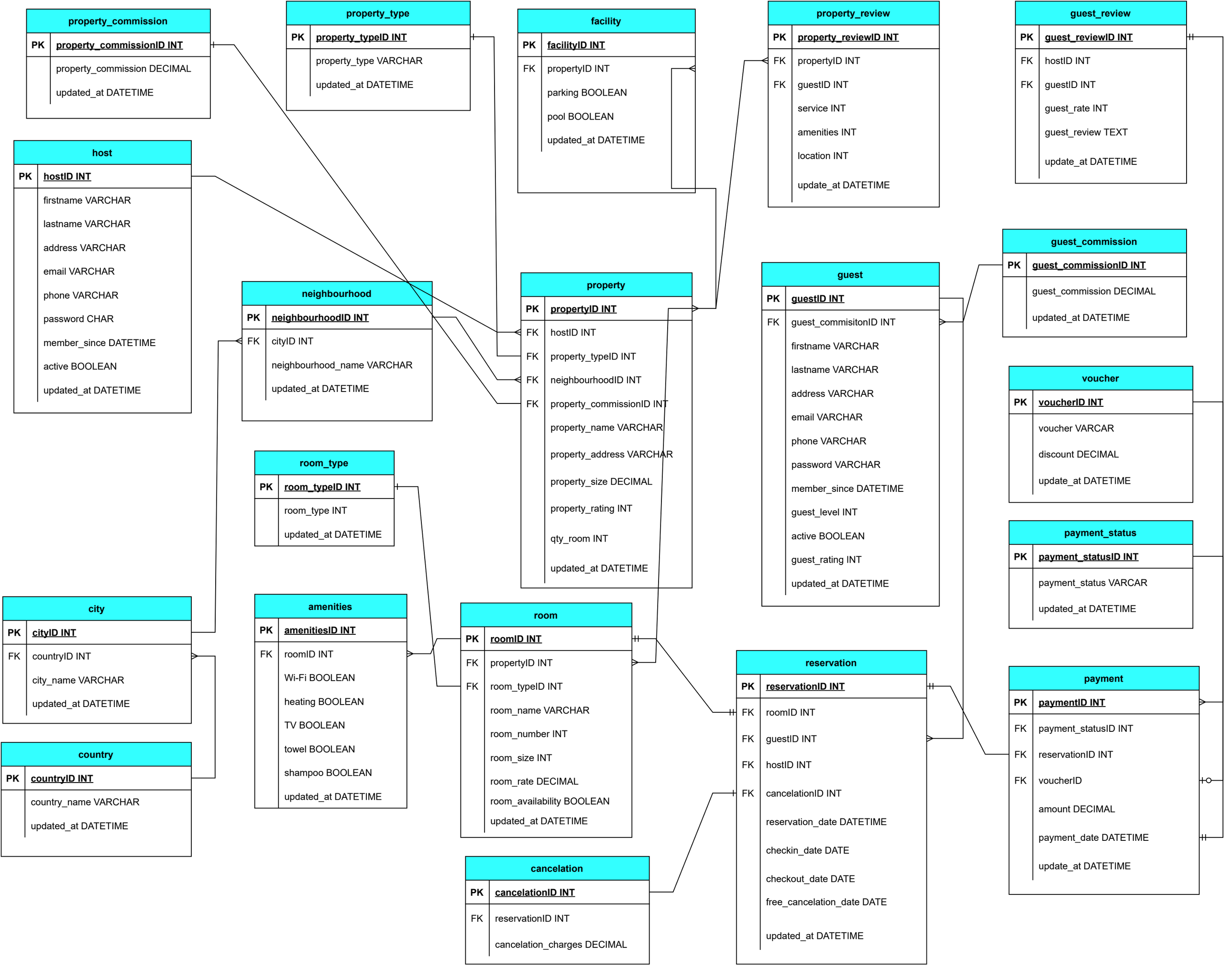
payment: guests pay via online banking or credit card. Market retain payment for 24 hours after the check-in date.

payment_status: payment status has three categories 1: paid, 2: on-hold, 3: transactional problem.

cancelation: any cancellation linked to the reservationID. Cancellation before the free_cancel_date column in the reservation table is free, otherwise it will be charged. Every reservation has zero or one cancellation.

Required Software:

- Entity Relation Diagram: draw.io
- Relation Database Management System: MySQL
- Report Writing: Microsoft Word


property_commission
PK property_commissionID INT
property_commission DECIMAL
updated_at DATETIME
property_type
PK property_typeID INT
property_type VARCHAR
updated_at DATETIME
facility
PK facilityID INT
FK propertyID INT
parking BOOLEAN
pool BOOLEAN
updated_at DATETIME
property_review
PK property_reviewID INT
FK propertyID INT
FK guestID INT
service INT
amenities INT
location INT
update_at DATETIME
guest_review
PK guest_reviewID INT
FK hostID INT
FK guestID INT
guest_rate INT
guest_review TEXT
update_at DATETIME
host
PK hostID INT
firstname VARCHAR
lastname VARCHAR
address VARCHAR
email VARCHAR
phone VARCHAR
password CHAR
member_since DATETIME
active BOOLEAN
updated_at DATETIME
neighbourhood
PK neighbourhoodID INT
FK cityID INT
neighbourhood_name VARCHAR
updated_at DATETIME
property
PK propertyID INT
FK hostID INT
FK property_typeID INT
FK neighbourhoodID INT
FK property_commissionID INT
property_name VARCHAR
property_address VARCHAR
property_size DECIMAL
property_rating INT
qty_room INT
updated_at DATETIME
guest
PK guestID INT
FK guest_commisitonID INT
firstname VARCHAR
lastname VARCHAR
address VARCHAR
email VARCHAR
phone VARCHAR
password VARCHAR
member_since DATETIME
guest_level INT
active BOOLEAN
guest_rating INT
updated_at DATETIME
guest_commission
PK guest_commissionID INT
guest_commission DECIMAL
updated_at DATETIME
voucher
PK voucherID INT
voucher VARCAR
discount DECIMAL
update_at DATETIME
payment_status
PK payment_statusID INT
payment_status VARCAR
updated_at DATETIME
room_type
PK room_typeID INT
room_type INT
updated_at DATETIME
amenities
PK amenitiesID INT
FK roomID INT
Wi-Fi BOOLEAN
heating BOOLEAN
TV BOOLEAN
towel BOOLEAN
shampoo BOOLEAN
updated_at DATETIME
room
PK roomID INT
FK propertyID INT
FK room_typeID INT
room_name VARCHAR
room_number INT
room_size INT
room_rate DECIMAL
room_availability BOOLEAN
updated_at DATETIME
reservation
PK reservationID INT
FK roomID INT
FK guestID INT
FK hostID INT
FK cancelationID INT
reservation_date DATETIME
checkin_date DATE
checkout_date DATE
free_cancelation_date DATE
updated_at DATETIME
payment
PK paymentID INT
FK payment_statusID INT
FK reservationID INT
FK voucherID
amount DECIMAL
payment_date DATETIME
update_at DATETIME
city
PK cityID INT
FK countryID INT
city_name VARCHAR
updated_at DATETIME
country
PK countryID INT
country_name VARCHAR
updated_at DATETIME
cancelation
PK cancelationID INT
FK reservationID INT
cancelation_charges DECIMAL

renting_db

creating database with Relation Database Management System MySQL

In this phase, all the SQL statements of the 20 tables will be copied and displayed with a screenshot of the result.

Create Database:

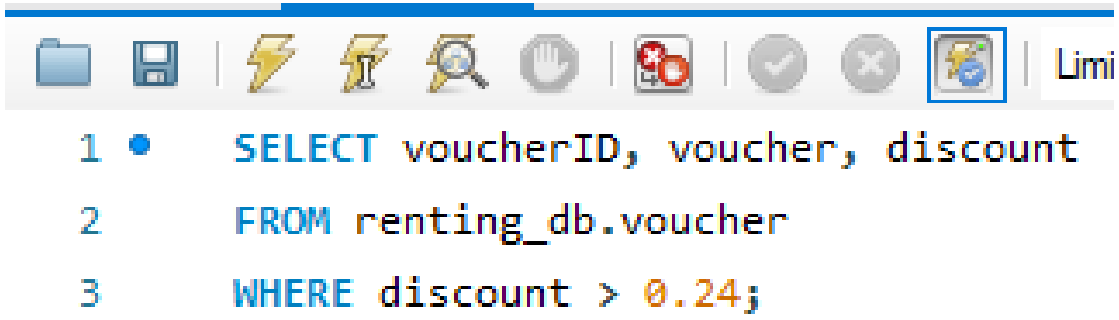
```
DROP DATABASE IF EXISTS renting_db;

CREATE DATABASE IF NOT EXISTS renting_db;

USE renting_db;

DROP TABLE IF EXISTS country, city, property_commission, property_type, neighbourhood, host, property, facility, room_type, room, amenities, guest_commission, guest, property_review, guest_review, cancelation, reservation, payment_status, voucher, payment;
```

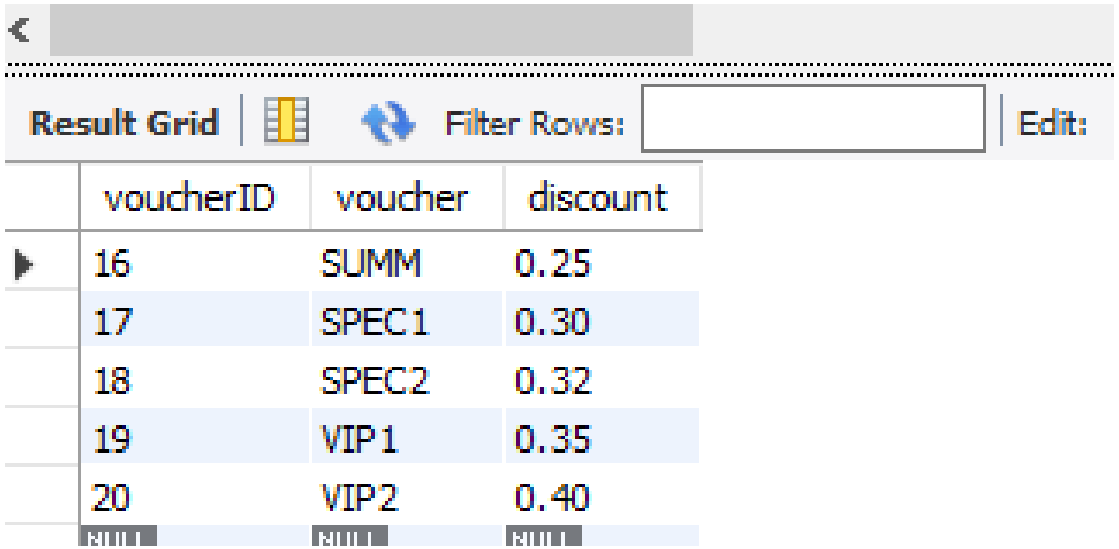
voucher

Creating voucher table:

```
CREATE TABLE voucher
(voucherID INTEGER PRIMARY KEY
AUTO_INCREMENT,
voucher VARCHAR(20),
discount DECIMAL(4,2),
updated_at DATETIME DEFAULT
now());
```

SQL query





voucherID	voucher	discount
16	SUMM	0.25
17	SPEC1	0.30
18	SPEC2	0.32
19	VIP1	0.35
20	VIP2	0.40

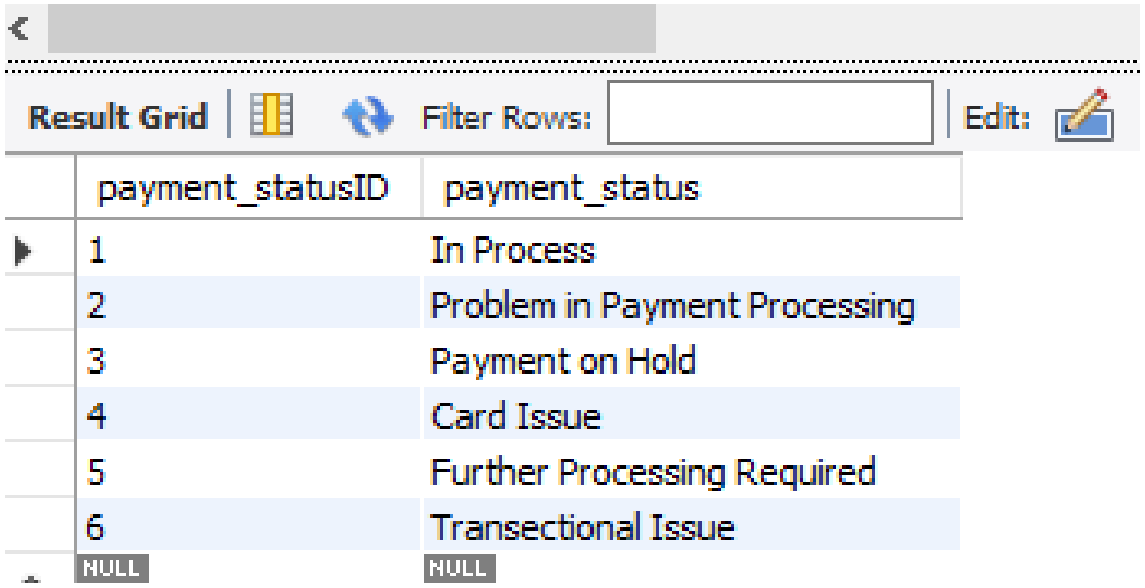
payment_status

Creating payment_status table:

```
CREATE TABLE payment_status
(payment_statusID INTEGER
PRIMARY KEY AUTO_INCREMENT,
payment_status VARCHAR(50),
updated_at DATETIME DEFAULT
now());
```

SQL query


```
1  SELECT payment_statusID, payment_status
2  FROM renting_db.payment_status
3  LIMIT 6;
```



payment_statusID	payment_status
1	In Process
2	Problem in Payment Processing
3	Payment on Hold
4	Card Issue
5	Further Processing Required
6	Transectional Issue
NULL	NULL

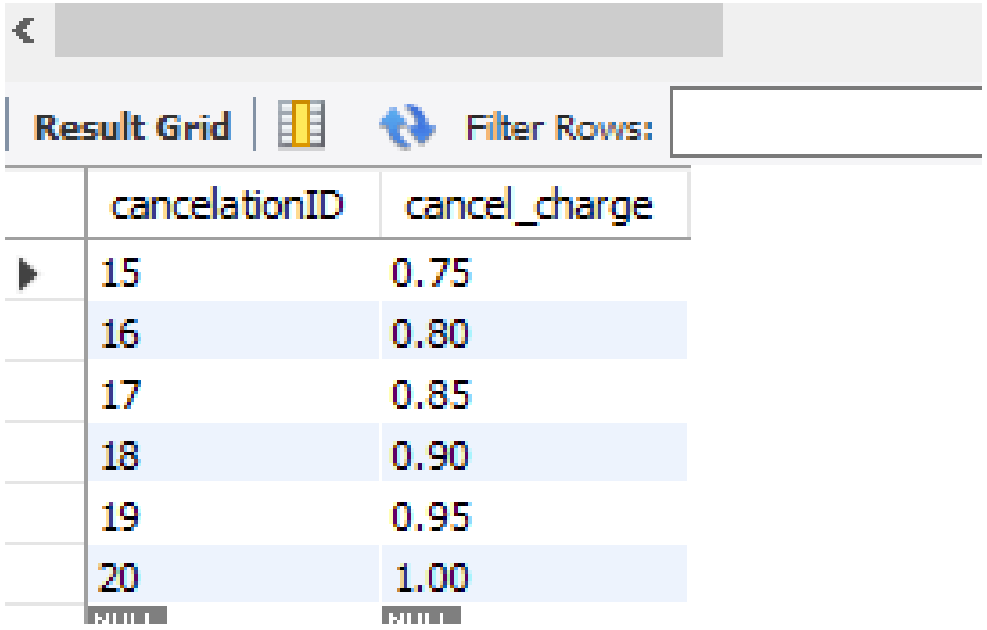
cancelation

Creating cancelation table:

```
CREATE TABLE cancelation
(cancelationID INTEGER PRIMARY
KEY AUTO_INCREMENT,
cancel_charge DECIMAL(5,2),
updated_at DATETIME DEFAULT
now() );
```

SQL query

```
1 •  SELECT cancelationID,
2    cancel_charge
3    FROM renting_db.cancelation
4    WHERE cancel_charge > .70;
```



Result Grid | Filter Rows:

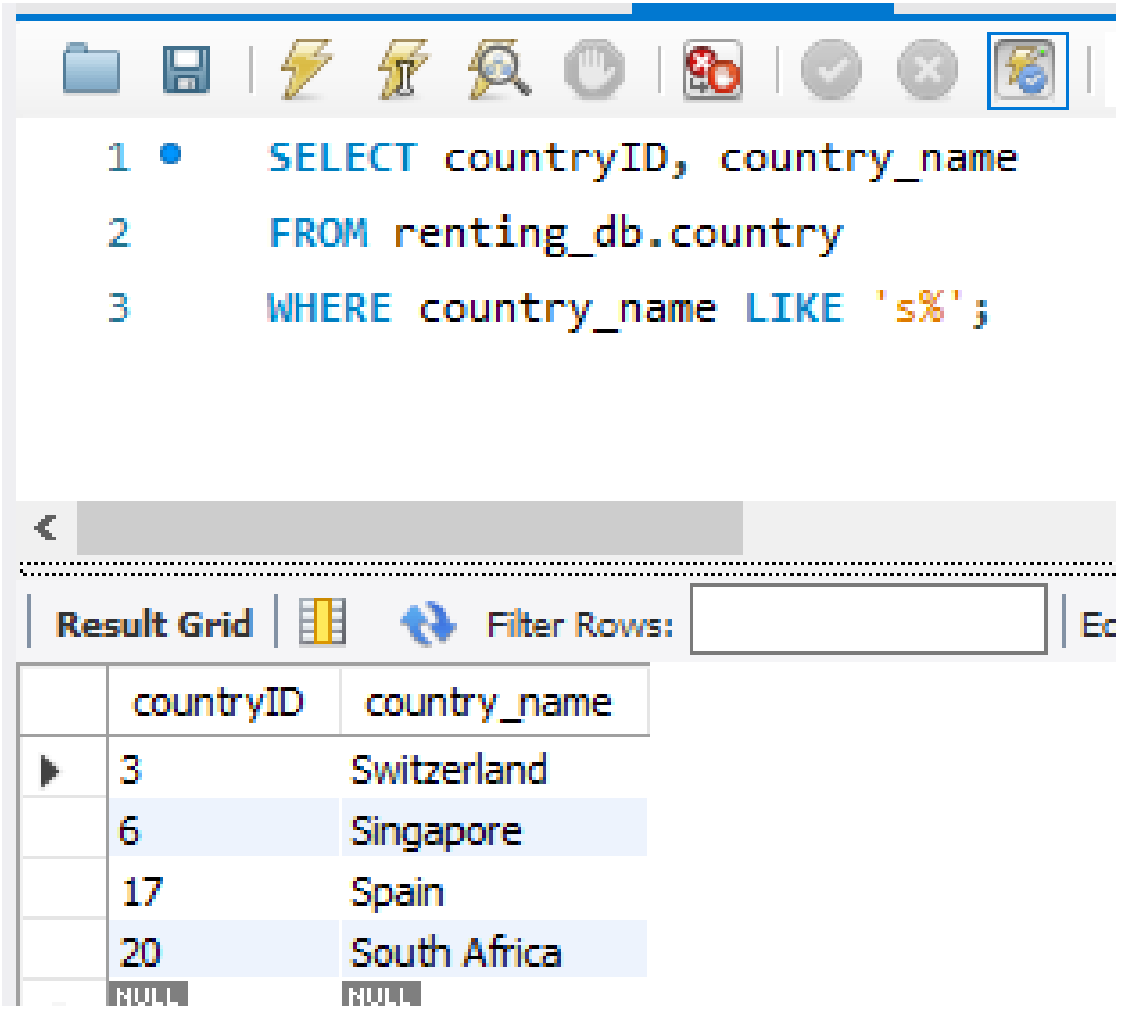
cancelationID	cancel_charge
15	0.75
16	0.80
17	0.85
18	0.90
19	0.95
20	1.00

country

Creating country table:

```
CREATE TABLE country
(countryID INTEGER PRIMARY KEY
AUTO_INCREMENT,
country_name VARCHAR(70) NOT
NULL,
updated_at DATETIME DEFAULT
now());
```

SQL query



city

Creating city table:

```
CREATE TABLE city
(cityID INTEGER PRIMARY KEY
AUTO_INCREMENT,countryID
INTEGER,city_name VARCHAR(70)
NOT NULL,FOREIGN KEY (countryID)
REFERENCES country (countryID),
updated_at DATETIME DEFAULT
now());
```

SQL query

```
1  SELECT cityID, city.city_name,
2  country_name
3  FROM renting_db.city
4  NATURAL JOIN country
5  WHERE city_name LIKE '%an%';
```

Result Grid | Filter Rows:

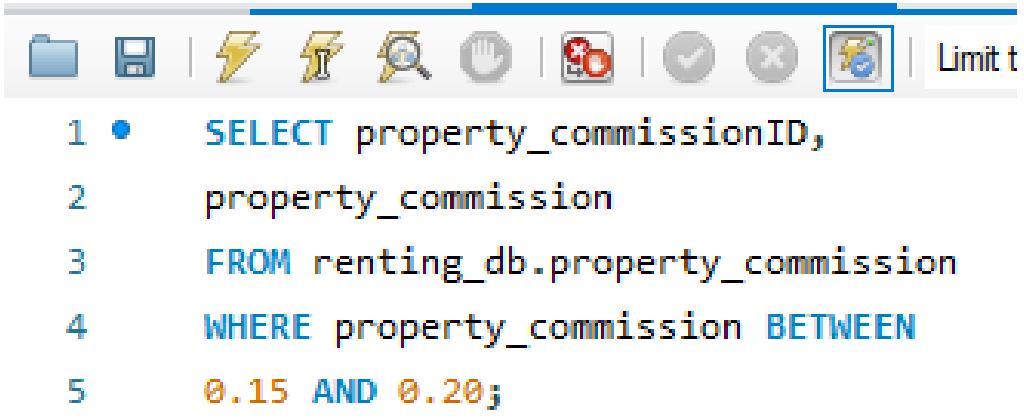
cityID	city_name	country_name
3	Manchester	United Kingdom
5	Bangkok	Thailand
6	Chiang Mai	Thailand
12	Istanbul	Turkey
13	Antalya	Turkey

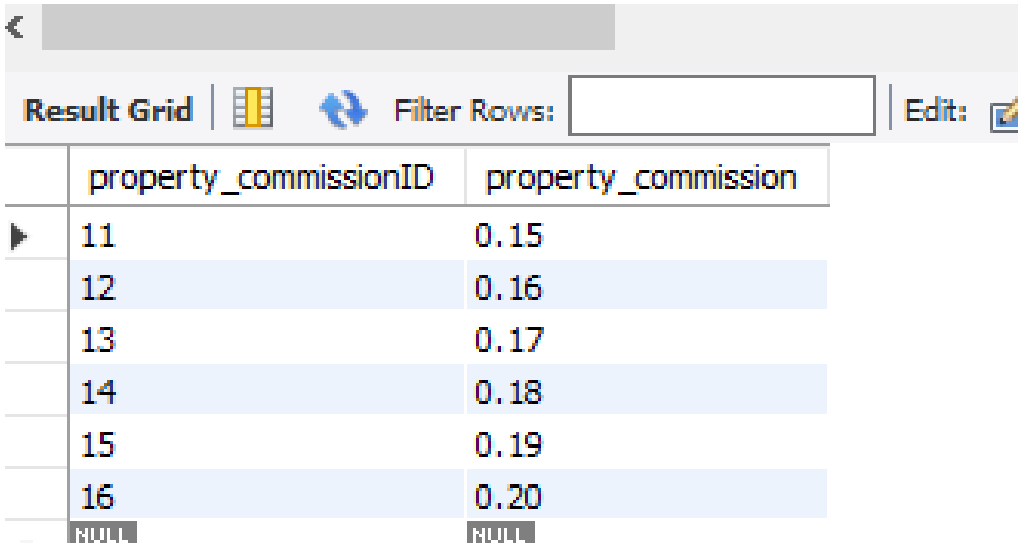
property_commission

Creating property_commission table:

```
CREATE TABLE property_commission
(property_commissionID INTEGER
PRIMARY KEY AUTO_INCREMENT,
property_commission DECIMAL(4,2)
NOT NULL,
updated_at DATETIME DEFAULT
now());
```

SQL query





property_type

Creating property_type table:

```
CREATE TABLE property_type
(property_typeID INTEGER PRIMARY
KEY AUTO_INCREMENT,
property_type VARCHAR(30),
updated_at DATETIME DEFAULT
now());
```

SQL query

```
1  SELECT property_typeID,
2  property_type
3  FROM renting_db.property_type
4  WHERE property_type LIKE '%n%';
```

Result Grid | Filter Rows:

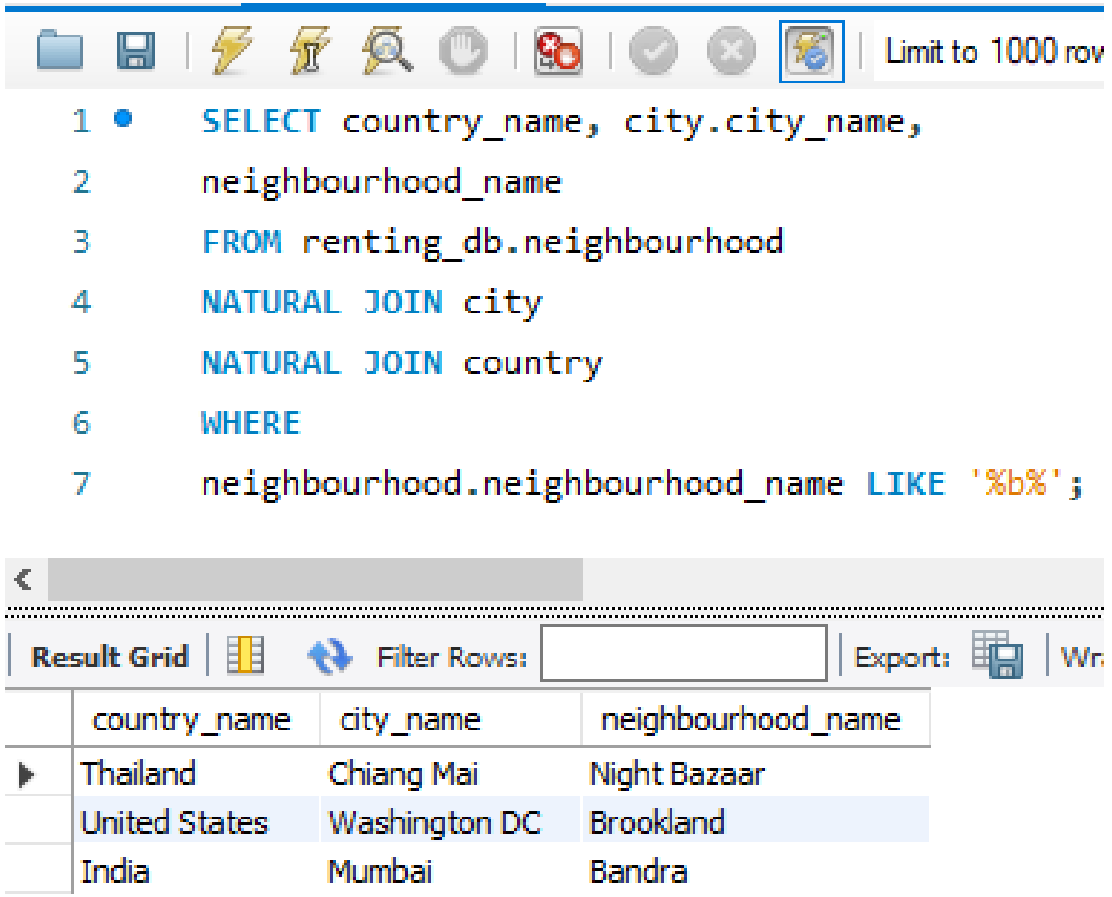
property_typeID	property_type
1	Apartment
2	Serviced Apartment
5	Town House
6	Bed and Breakfast
7	Bungalow
9	Hostel Accommodation
16	Cabin

neighbourhood

Creating neighbourhood table:

```
CREATE TABLE neighbourhood
(neighbourhoodID INTEGER PRIMARY
KEY AUTO_INCREMENT,
cityID INTEGER,
neighbourhood_name VARCHAR(30),
FOREIGN KEY (cityID) REFERENCES
city (cityID),
updated_at DATETIME DEFAULT
now());
```

SQL query

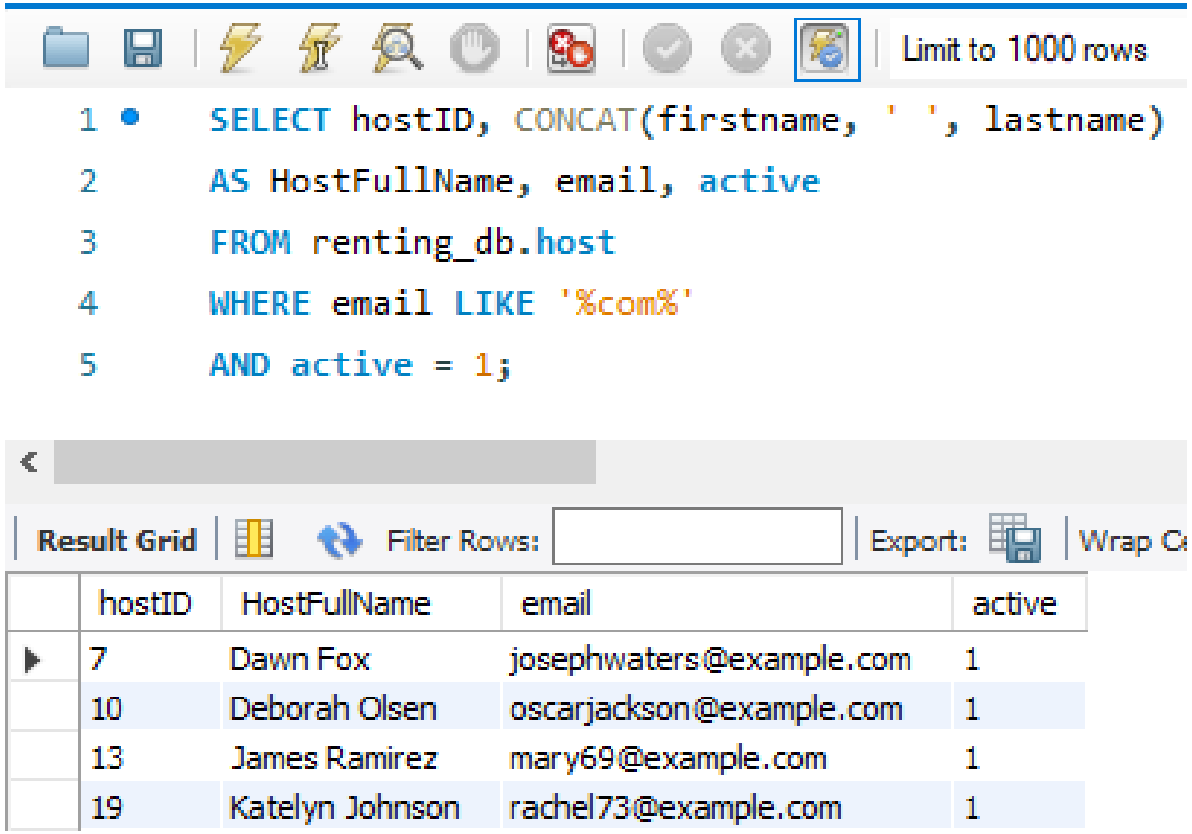


host

Creating host table:

```
CREATE TABLE host
(hostID INTEGER PRIMARY KEY
AUTO_INCREMENT,
firstname VARCHAR(30),
lastname VARCHAR(30),
address VARCHAR(100),
email VARCHAR(30),
phone VARCHAR(20),
password CHAR(8),
member_since DATETIME,
active BOOLEAN,
updated_at DATETIME DEFAULT now());
```

SQL query

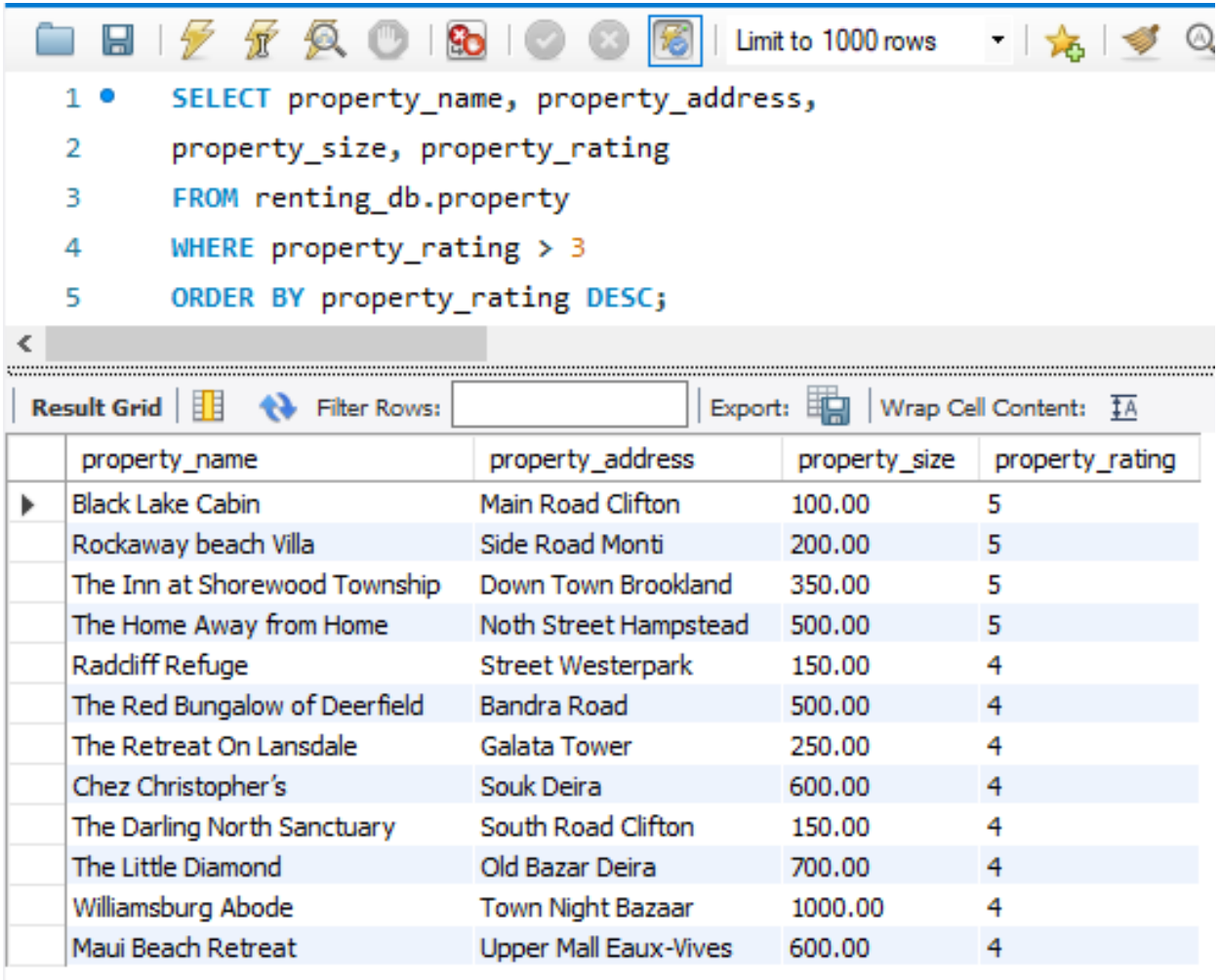


property

Creating property table:

```
CREATE TABLE property
(propertyID INTEGER PRIMARY KEY
AUTO_INCREMENT,hostID
INTEGER,property_typeID
INTEGER,neighbourhoodID
INTEGER,property_commissionID
INTEGER,property_name
VARCHAR(50),property_address
VARCHAR(100),property_size
DECIMAL(8,2),property_rating INTEGER,qty_room
INTEGER,FOREIGN KEY (property_commissionID)
REFERENCES property_commission
(property_commissionID),FOREIGN KEY (hostID)
REFERENCES host (hostID),FOREIGN KEY
(property_typeID) REFERENCES property_type
(property_typeID),FOREIGN KEY (neighbourhoodID)
REFERENCES neighbourhood
(neighbourhoodID),updated_at DATETIME DEFAULT
now());
```

SQL query



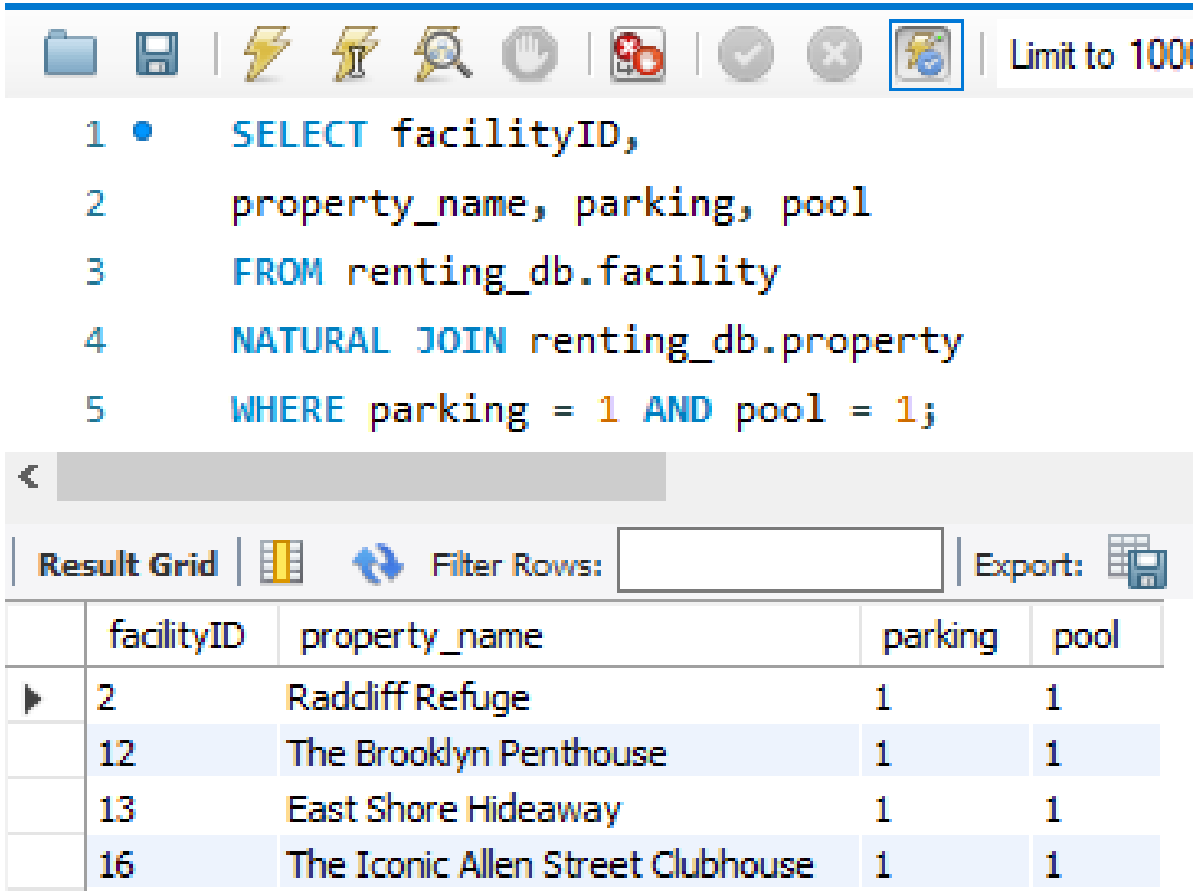
property_name	property_address	property_size	property_rating
Black Lake Cabin	Main Road Clifton	100.00	5
Rockaway beach Villa	Side Road Monti	200.00	5
The Inn at Shorewood Township	Down Town Brookland	350.00	5
The Home Away from Home	Noth Street Hampstead	500.00	5
Radcliff Refuge	Street Westerpark	150.00	4
The Red Bungalow of Deerfield	Bandra Road	500.00	4
The Retreat On Lansdale	Galata Tower	250.00	4
Chez Christopher's	Souk Deira	600.00	4
The Darling North Sanctuary	South Road Clifton	150.00	4
The Little Diamond	Old Bazar Deira	700.00	4
Williamsburg Abode	Town Night Bazaar	1000.00	4
Maui Beach Retreat	Upper Mall Eaux-Vives	600.00	4

facility

Creating facility table:

```
CREATE TABLE facility
(facilityID INTEGER PRIMARY KEY
AUTO_INCREMENT,
propertyID INTEGER,
parking BOOLEAN,
pool BOOLEAN,
FOREIGN KEY (propertyID)
REFERENCES property (propertyID),
updated_at DATETIME DEFAULT
now() );
```

SQL query

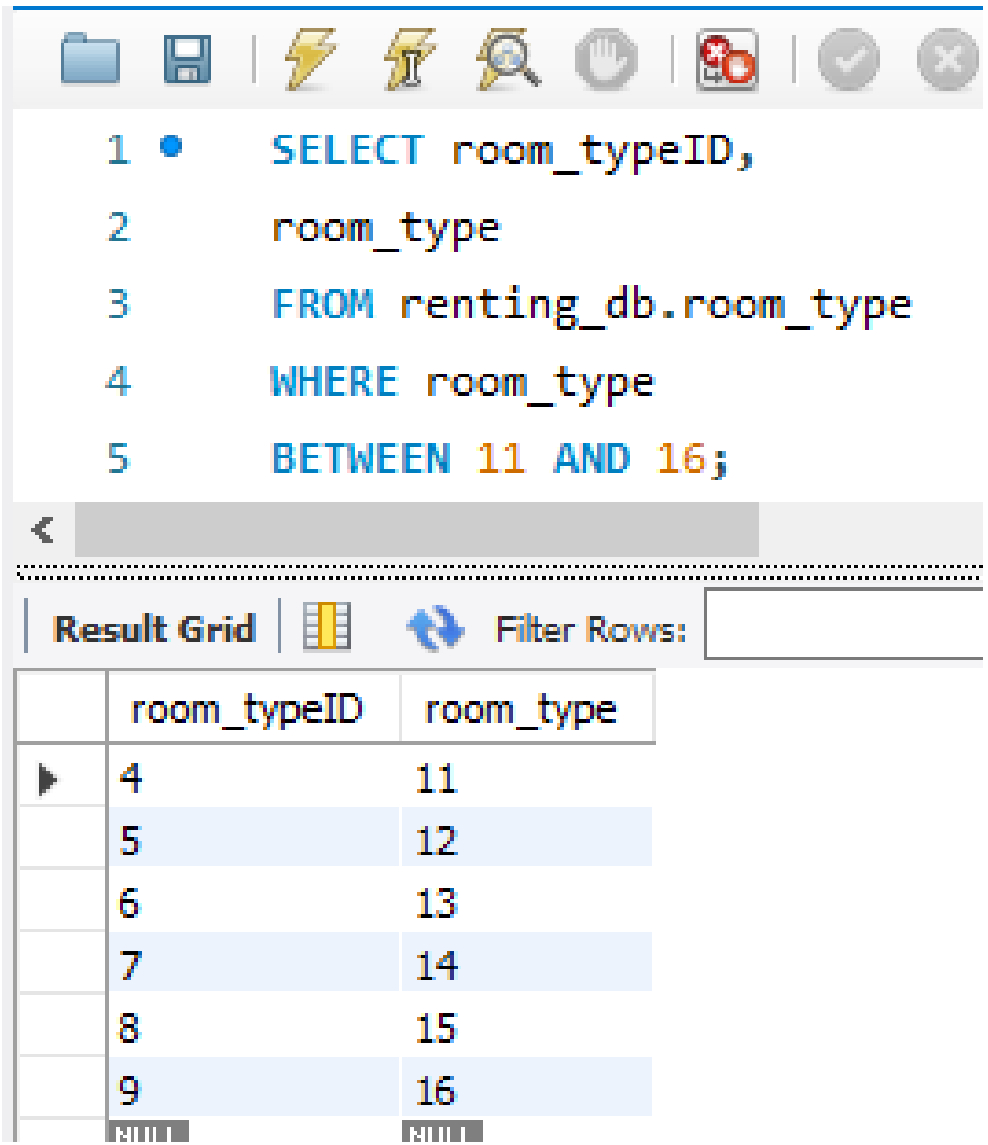


room_type

Creating room_type table:

```
CREATE TABLE room_type
(room_typeID INTEGER PRIMARY
KEY AUTO_INCREMENT,room_type
INTEGER,updated_at DATETIME
DEFAULT now() );
```

SQL query

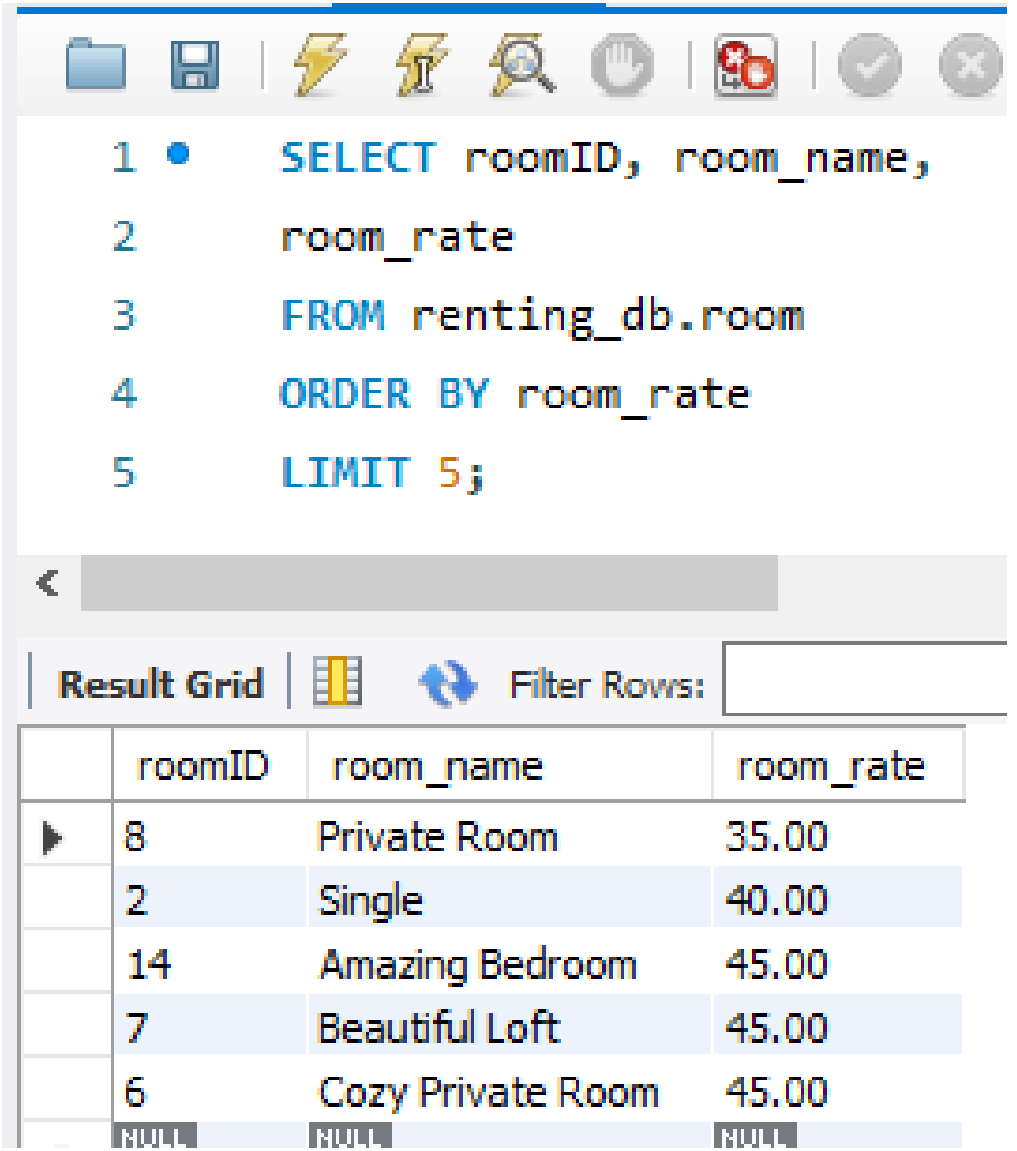


room

Creating room table:

```
CREATE TABLE room
(roomID INTEGER PRIMARY KEY
AUTO_INCREMENT,propertyID
INTEGER,room_typeID
INTEGER,room_name
VARCHAR(30),room_number
INTEGER,room_size INTEGER,room_rate
DECIMAL(6,2),room_availability
BOOLEAN,FOREIGN KEY (room_typeID)
REFERENCES room_type
(room_typeID),FOREIGN KEY (propertyID)
REFERENCES property
(propertyID),updated_at DATETIME
DEFAULT now() );
```

SQL query



```
1  SELECT roomID, room_name,
2  room_rate
3  FROM renting_db.room
4  ORDER BY room_rate
5  LIMIT 5;
```

Result Grid | Filter Rows:

roomID	room_name	room_rate
8	Private Room	35.00
2	Single	40.00
14	Amazing Bedroom	45.00
7	Beautiful Loft	45.00
6	Cozy Private Room	45.00
NULL	NULL	NULL

amenities

Creating amenities table:

```
CREATE TABLE amenities
(amenitiesID INTEGER PRIMARY KEY
AUTO_INCREMENT,roomID
INTEGER,WiFi BOOLEAN,heating
BOOLEAN,TV BOOLEAN,towel
BOOLEAN,shampoo
BOOLEAN,FOREIGN KEY (roomID)
REFERENCES room
(roomID),updated_at DATETIME
DEFAULT now() );
```

SQL query

```
1  SELECT amenitiesID, room_name,
2  WiFi FROM renting_db.amenities
3  NATURAL JOIN renting_db.room
4  WHERE WiFi =  1
5  LIMIT 5;
```

Result Grid | Filter Rows:

amenitiesID	room_name	WiFi
3	Double	1
6	Cozy Private Room	1
7	Beautiful Loft	1
8	Private Room	1
9	Bright Brooklyn	1

guest_commission

Creating guest_commission table:

```
CREATE TABLE guest_commission
(guest_commissionID INTEGER
PRIMARY KEY AUTO_INCREMENT,
guest_commission DECIMAL(4,2),
updated_at DATETIME DEFAULT
now() );
```

SQL query

```
1 •  SELECT guest_commissionID,
2    guest_commission
3    FROM renting_db.guest_commission
4    WHERE guest_commission
5    BETWEEN .10 AND .15;
```

Result Grid | Filter Rows:

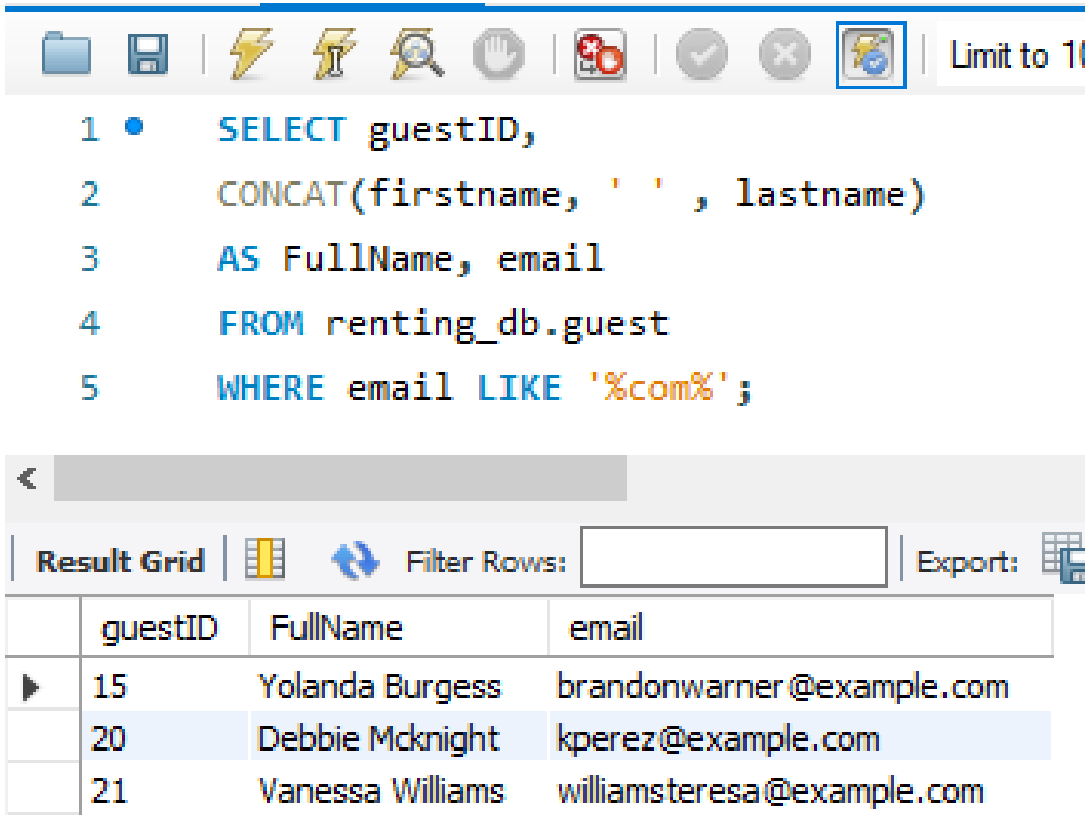
guest_commissionID	guest_commission
6	0.10
7	0.11
8	0.12
9	0.13
10	0.14
11	0.15

guest

Creating guest table:

```
CREATE TABLE guest
(guestID INTEGER PRIMARY KEY
AUTO_INCREMENT,guest_commissionID
INTEGER,firstname VARCHAR(30),lastname
VARCHAR(30),address
VARCHAR(100),email VARCHAR(30),phone
VARCHAR(20),  password
CHAR(8),member_since
DATETIME,guest_level INTEGER, active
BOOLEAN, guest_rating INTEGER,FOREIGN
KEY (guest_commissionID) REFERENCES
guest_commission(guest_commissionID),
updated_at DATETIME DEFAULT now());
```

SQL query

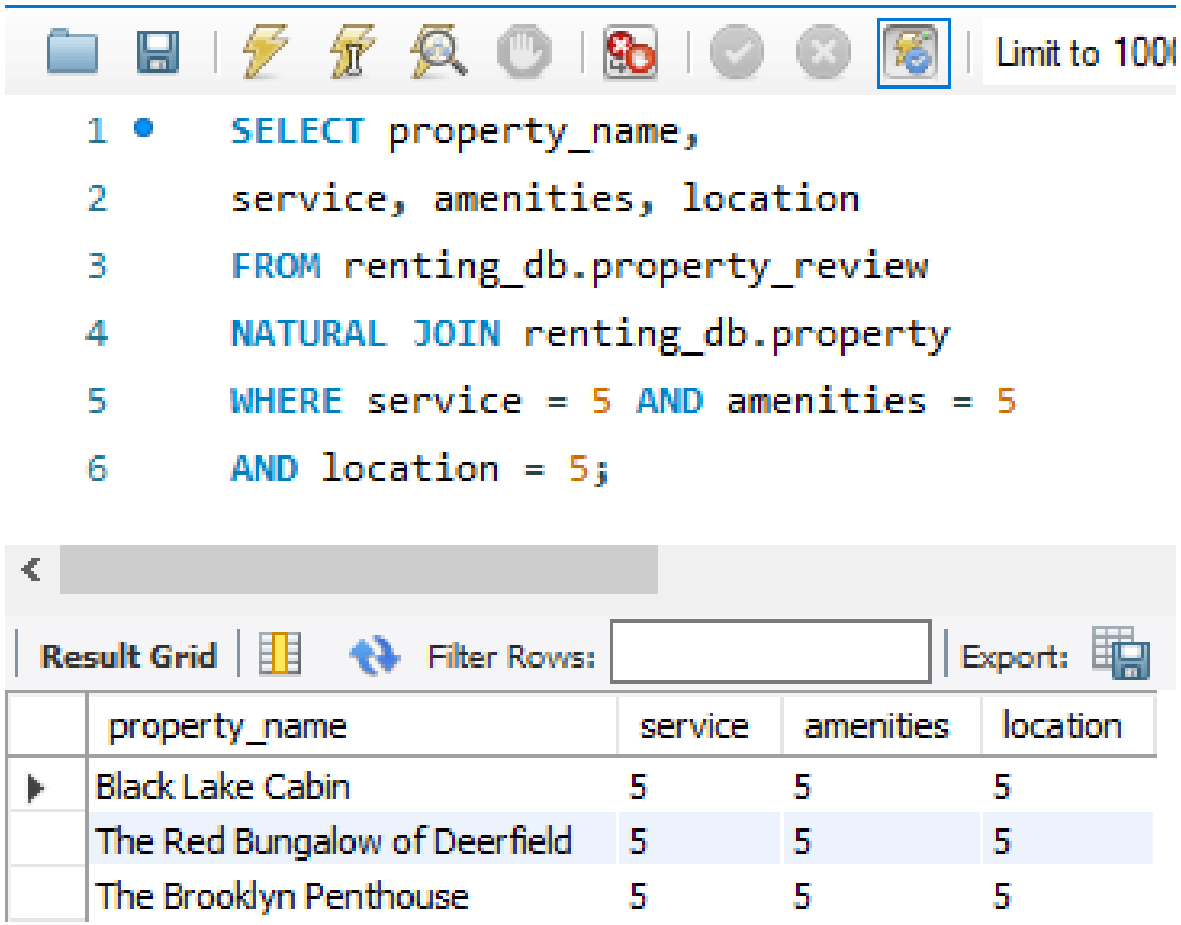


property_review

Creating property_review table:

```
CREATE TABLE property_review
(property_reviewID INTEGER PRIMARY
KEY AUTO_INCREMENT,propertyID
INTEGER,guestID INTEGER,service
INTEGER,amenities INTEGER,location
INTEGER,FOREIGN KEY (guestID)
REFERENCES guest (guestID),FOREIGN
KEY (propertyID) REFERENCES property
(propertyID),updated_at DATETIME
DEFAULT now());
```

SQL query



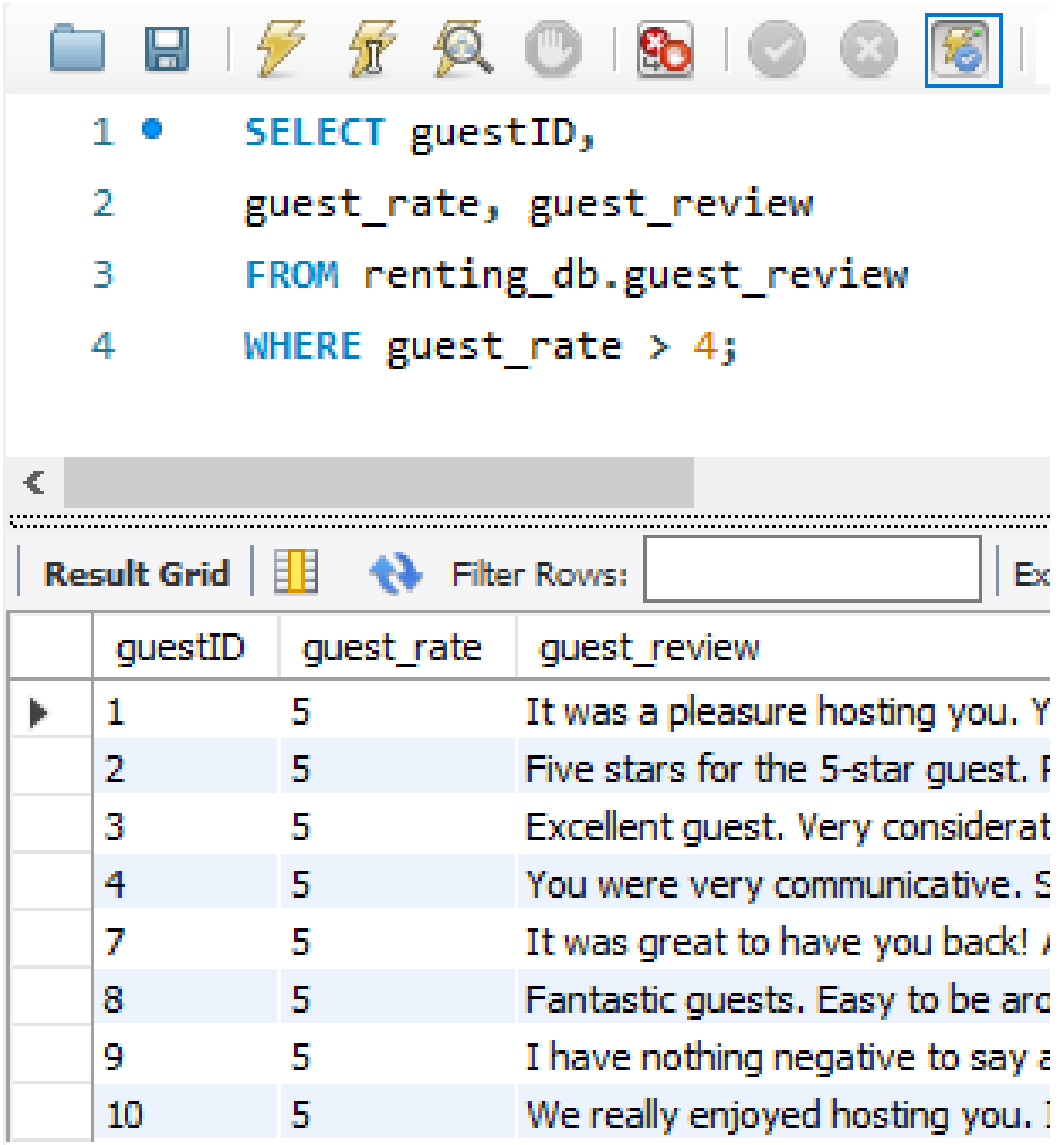
property_name	service	amenities	location
Black Lake Cabin	5	5	5
The Red Bungalow of Deerfield	5	5	5
The Brooklyn Penthouse	5	5	5

guest_review

Creating guest_review table:

```
CREATE TABLE guest_review
(guest_reviewID INTEGER PRIMARY
KEY AUTO_INCREMENT,hostID
INTEGER,guestID
INTEGER,guest_rate
INTEGER,guest_review
TEXT,FOREIGN KEY (hostID)
REFERENCES host (hostID),FOREIGN
KEY (guestID) REFERENCES guest
(guestID),updated_at DATETIME
DEFAULT now());
```

SQL query

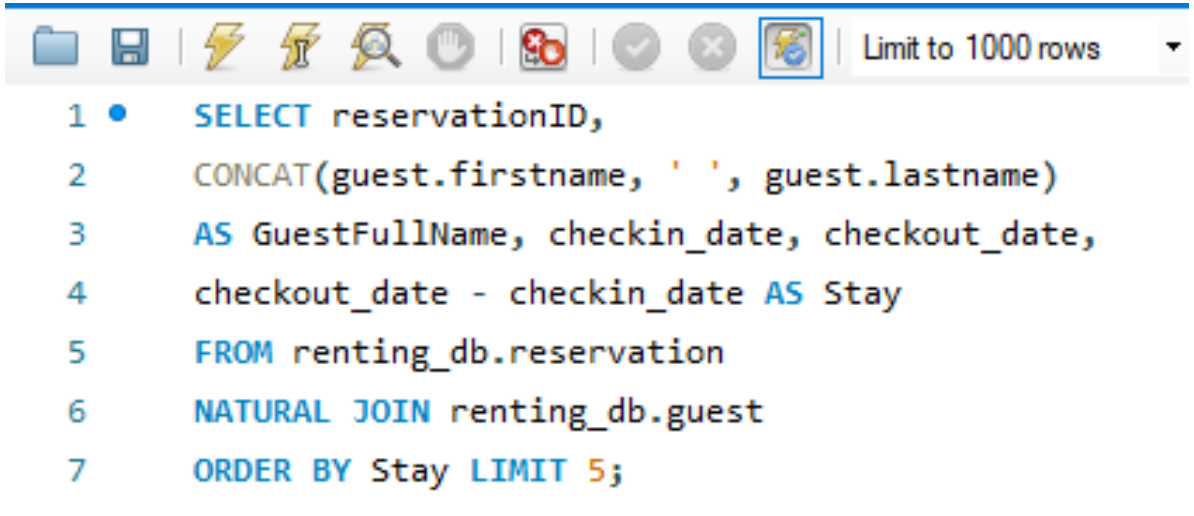


reservation

Creating reservation table:

```
CREATE TABLE reservation
(reservationID INTEGER PRIMARY KEY
AUTO_INCREMENT,roomID INTEGER, guestID
INTEGER,hostID INTEGER,cancelationID
INTEGER, reservation_date
DATETIME,checkin_date DATE,checkout_date
DATE,free_cancelation_date DATE,FOREIGN
KEY (roomID) REFERENCES room
(roomID),FOREIGN KEY (guestID) REFERENCES
guest (guestID),FOREIGN KEY (hostID)
REFERENCES host (hostID),FOREIGN KEY
(cancelationID) REFERENCES cancelation
(cancelationID),CHECK (reservation_date <=
free_cancelation_date <= checkin_date <
checkout_date),updated_at DATETIME
DEFAULT now() );
```

SQL query



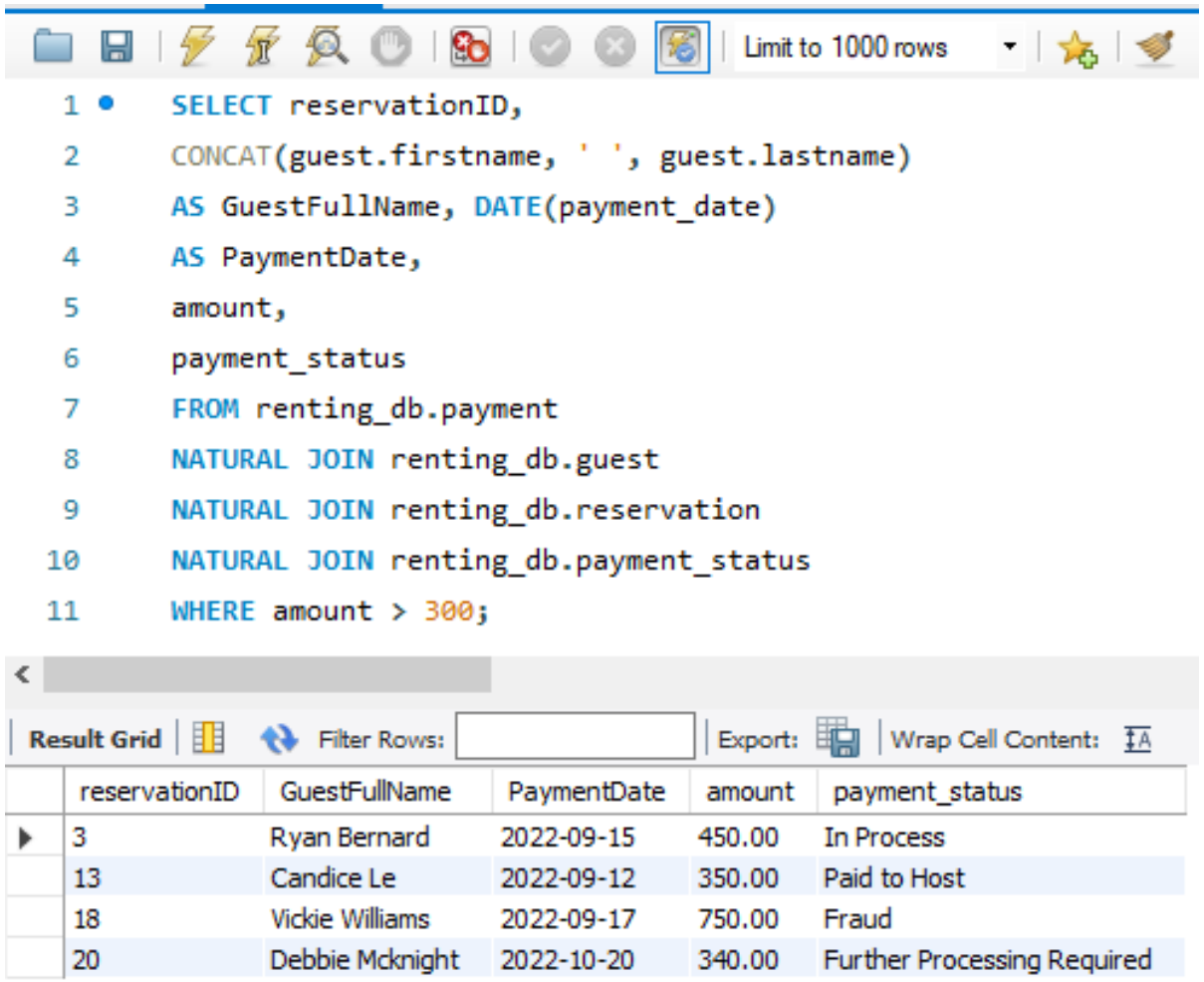
reservationID	GuestFullName	checkin_date	checkout_date	Stay
1	Philip Russell	2022-09-15	2022-09-19	4
12	Annette Hayes	2022-10-05	2022-10-10	5
15	Yolanda Burgess	2022-10-20	2022-10-25	5
3	Ryan Bernard	2022-10-11	2022-10-18	7
6	Colleen Davidson	2022-10-21	2022-10-30	9

payment

Creating payment table:

```
CREATE TABLE payment
(paymentID INTEGER PRIMARY KEY
AUTO_INCREMENT,payment_statusID
INTEGER,reservationID INTEGER,
voucherID INTEGER,amount
DECIMAL(8,2),payment_date DATETIME,
FOREIGN KEY (payment_statusID)
REFERENCES payment_status
(payment_statusID),FOREIGN KEY
(reservationID) REFERENCES reservation
(reservationID),FOREIGN KEY (voucherID)
REFERENCES voucher
(voucherID),updated_at DATETIME
DEFAULT now()  );
```

SQL query

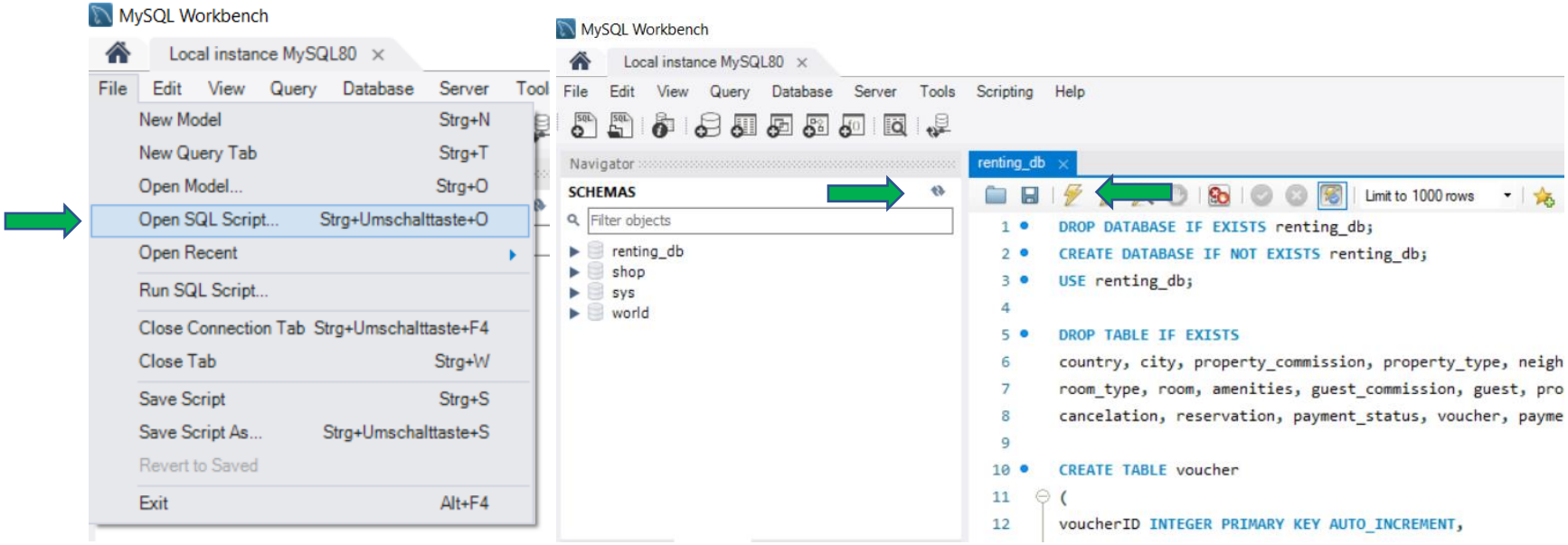


Database for renting houses, apartments, and rooms

Final Phase

Installation:

Download file on local machine. Make sure MySQL is already installed on machine. From MySQL Workbench click File, Open SQL Scripts, choose “renting_db.sql” file, click “execute” icon to run the script and then click “refresh” button in SCHEMAS.

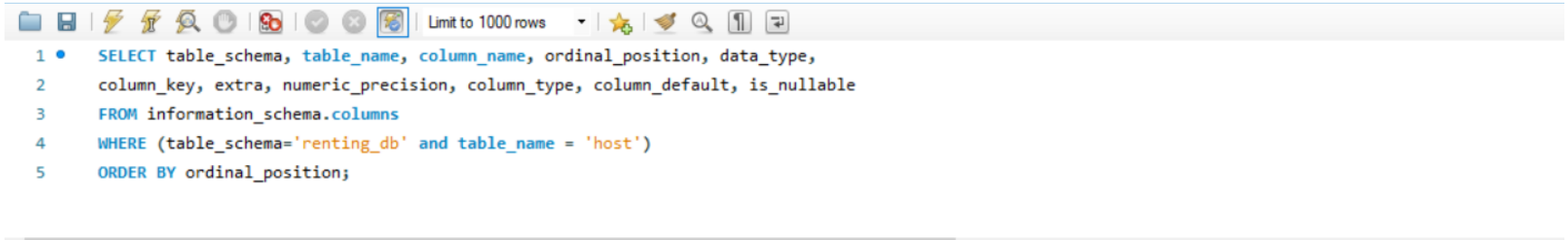


Metadata:

Use following SQL command to get metadata information from a specific table.

SQL Command:

SELECT table_schema, table_name, column_name, ordinal_position, data_type,
column_key, extra, numeric_precision, column_type, column_default, is_nullable
FROM information_schema.columns
WHERE (table_schema='renting_db' and table_name = 'host')
ORDER BY ordinal_position;



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

TABLE_SCHEMA	TABLE_NAME	COLUMN_NAME	ORDINAL_POSITION	DATA_TYPE	COLUMN_KEY	EXTRA	NUMERIC_PRECISION	COLUMN_TYPE	COLUMN_DEFAULT	IS_NULLABLE
renting_db	host	hostID	1	int	PRI	auto_increment	10	int	NULL	NO
renting_db	host	firstname	2	varchar			NULL	varchar(30)	NULL	YES
renting_db	host	lastname	3	varchar			NULL	varchar(30)	NULL	YES
renting_db	host	address	4	varchar			NULL	varchar(100)	NULL	YES
renting_db	host	email	5	varchar			NULL	varchar(30)	NULL	YES
renting_db	host	phone	6	varchar			NULL	varchar(20)	NULL	YES
renting_db	host	password	7	char			NULL	char(8)	NULL	YES
renting_db	host	member_since	8	datetime			NULL	datetime	NULL	YES
renting_db	host	active	9	tinyint			3	tinyint(1)	NULL	YES
renting_db	host	updated_at	10	datetime		DEFAULT_GENERATED	NULL	datetime	CURRENT_TIMESTAMP	YES

renting_db Functionality:

Data-driven decision-making empowers businesses to create real-time insights and forecasts to improve their performance. Through this, companies can test the success of various strategies and make informed business decisions for sustainable growth. Here are some use cases and functional aspects of renting_db.

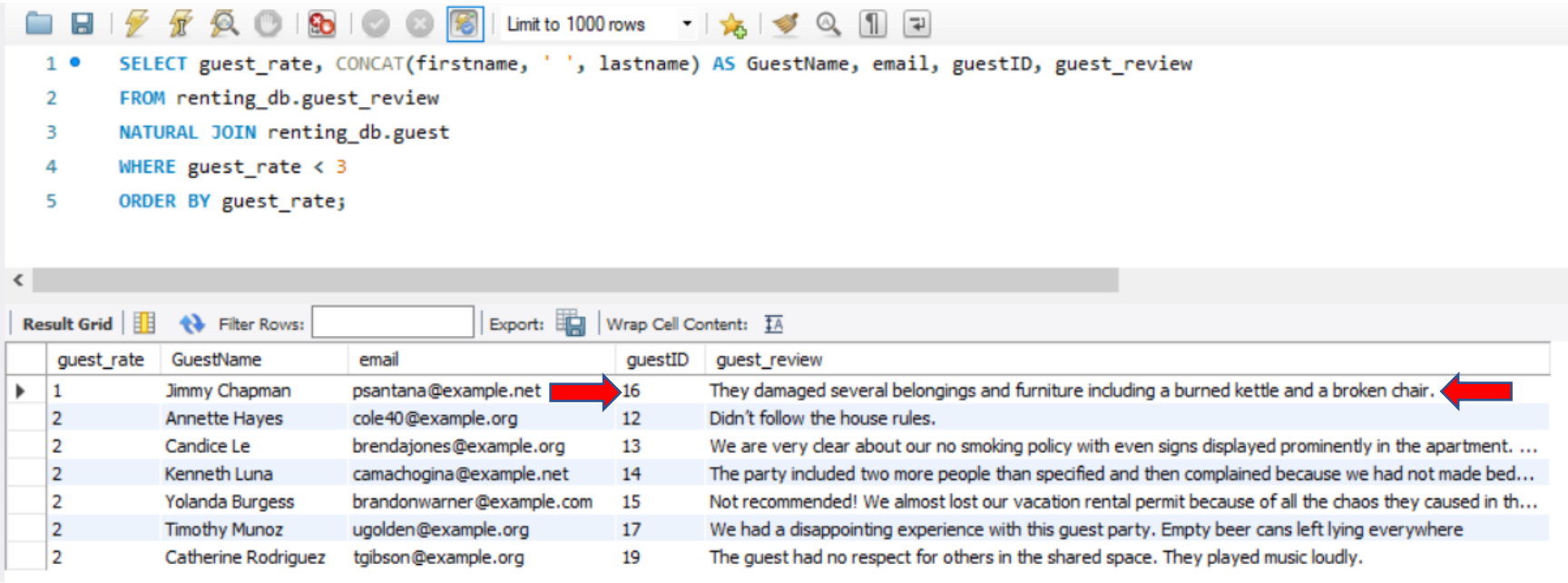
- To verify suspicious payments by the guests

```
SELECT paymentID, reservationID,
firstname, lastname, email,
amount, payment_status
FROM renting_db.payment
NATURAL JOIN renting_db.payment_status
NATURAL JOIN renting_db.reservation
NATURAL JOIN renting_db.guest
WHERE payment_status LIKE 'F%';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

paymentID	reservationID	firstname	lastname	email	amount	payment_status
20	20	Debbie	Mcknight	kperez@example.com	340.00	Further Processing Required
18	18	Vickie	Williams	juliecox@example.org	750.00	Fraud

- To ban a guest who received awful reviews from a host. In this example, guestID #16 received significant terrible reviews from the host. This type of guest should be completely banned from the market to save the image of the whole market.



```
1 •  SELECT guest_rate, CONCAT(firstname, ' ', lastname) AS GuestName, email, guestID, guest_review
2    FROM renting_db.guest_review
3    NATURAL JOIN renting_db.guest
4    WHERE guest_rate < 3
5    ORDER BY guest_rate;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

guest_rate	GuestName	email	guestID	guest_review
1	Jimmy Chapman	psantana@example.net	16	They damaged several belongings and furniture including a burned kettle and a broken chair.
2	Annette Hayes	cole40@example.org	12	Didn't follow the house rules.
2	Candice Le	brendajones@example.org	13	We are very clear about our no smoking policy with even signs displayed prominently in the apartment. ...
2	Kenneth Luna	camachogina@example.net	14	The party included two more people than specified and then complained because we had not made bed...
2	Yolanda Burgess	brandonwarner@example.com	15	Not recommended! We almost lost our vacation rental permit because of all the chaos they caused in th...
2	Timothy Munoz	ugolden@example.org	17	We had a disappointing experience with this guest party. Empty beer cans left lying everywhere
2	Catherine Rodriguez	tgibson@example.org	19	The guest had no respect for others in the shared space. They played music loudly.

- Filter inactive host where property rating is incredible. Give these types of property host a better commission offer to motivate them to be more active. In this example, propertyID #3 and propertyID #6 have a significantly excellent rating from the guests. This type of property host should be best candidate to get a better commission model to improve the quality of the whole market.