NOTE: In the file submission due to privacy concerns you will need to change these lines of code for all of the files:

```
cat << EOF | sqlplus64
"username/password@(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(Host=oracle.scs.ryerson.ca)(Po
rt=1521))(CONNECT_DATA=(SID=orcl)))"
```

From username/password to your own login credentials.

We start by logging into the Ryerson SCS system and input the command in the folder that stores the code for the Menu:

bash Menu

This is the menu system:

```
=====================================================================
|              Hotel Management Database System                     |
|              CPS 510 - Group 13                                   |
|-------------------------------------------------------------------|
|                                                                   |
| Main Menu - Select Desired Operation(s):                          |
|                                                                   |
---------------------------------------------------------------------

  1) Drop Tables
  2) Create Tables
  3) Populate Tables
  4) Query Tables
  5) Show all Tables
  6) Search Table
  7) Update Table

  E) End/Exit
---------------------------------------------------------------------
_Choose:
```

Here we can see there are various options, we will select 2 to create tables

```
 Choose:
2

------------------------------------------------
Pick an Option
------------------------------------------------
1) Create card_info table
2) Create bill_address table
3) Create payment table
4) Create invoice table
5) Create address_info table
6) Create customer table
7) Create reservation table
8) Create books table
9) Create car_info table
10) Create parking table
11) Create room table
12) Create has table
13) Create room_type_detail table
14) Create room_type table
15) Create room_status table
16) Create room_price table
17) Create all tables

Press enter to return to previous Menu
------------------------------------------------
```

We have the option to create tables one by one or you can select 17 to create all of the tables

```
10) Create parking table
11) Create room table
12) Create has table
13) Create room_type_detail table
14) Create room_type table
15) Create room_status table
16) Create room_price table
17) Create all tables

Press enter to return to previous Menu
------------------------------------------------
1

SQL*Plus: Release 12.1.0.2.0 Production on Tue Nov 30 14:02:08 2021

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> SQL>   2    3    4    5
Table created.

SQL> SQL> SQL> Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

Enter return to continue
```

Here we select 1) Create card_info table and we can double-check that the table is created successfully by using 5) show all table options in the main menu

```
=================================================================
|               Hotel Management Database System                |
|               CPS 510 - Group 13                              |
|---------------------------------------------------------------|
|                                                               |
| Main Menu - Select Desired Operation(s):                      |
|                                                               |
-----------------------------------------------------------------

  1) Drop Tables
  2) Create Tables
  3) Populate Tables
  4) Query Tables
  5) Show all Tables
  6) Search Table
  7) Update Table

  E) End/Exit
-----------------------------------------------------------------
 Choose:
5

SQL*Plus: Release 12.1.0.2.0 Production on Tue Nov 30 14:02:26 2021

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> SQL> SQL>    2    3    4
TABLE_NAME
------------------------------
CARD_INFO

SQL> SQL> Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.
0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

Enter return to continue
```

We can drop this table by entering 1) Drop Tables and typing the table name that we want to drop:

```
================================================================
|              Hotel Management Database System                |
|              CPS 510 - Group 13                              |
|--------------------------------------------------------------|
|                                                              |
| Main Menu - Select Desired Operation(s):                     |
|                                                              |
----------------------------------------------------------------

  1) Drop Tables
  2) Create Tables
  3) Populate Tables
  4) Query Tables
  5) Show all Tables
  6) Search Table
  7) Update Table

  E) End/Exit
----------------------------------------------------------------
 Choose:
1

------------------------------------------------
List of Tables
------------------------------------------------
 card_info table
 bill_address table
 payment table
 invoice table
 address_info table
 customer table
 reservation table
 books table
 car_info table
 parking table
 room table
 has table
 room_type_detail table
 room_type table
 room_status table
 room_price table

------------------------------------------------
 Pick an Option :
------------------------------------------------
1) Drop specific table
2) Drop all tables

Press enter to return to previous Menu
------------------------------------------------
1
Enter Table name:
[card_info                                                                                                                ]

SQL*Plus: Release 12.1.0.2.0 Production on Tue Nov 30 14:03:03 2021

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL>
Table dropped.

SQL> Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options
```

As mentioned earlier we can also create all the tables:

```
================================================================
|              Hotel Management Database System                |
|              CPS 510 - Group 13                              |
|--------------------------------------------------------------|
|                                                              |
| Main Menu - Select Desired Operation(s):                     |
|                                                              |
----------------------------------------------------------------

  1) Drop Tables
  2) Create Tables
  3) Populate Tables
  4) Query Tables
  5) Show all Tables
  6) Search Table
  7) Update Table

  E) End/Exit
----------------------------------------------------------------
 Choose:
2

------------------------------------------------
Pick an Option
------------------------------------------------
1) Create card_info table
2) Create bill_address table
3) Create payment table
4) Create invoice table
5) Create address_info table
6) Create customer table
7) Create reservation table
8) Create books table
9) Create car_info table
10) Create parking table
11) Create room table
12) Create has table
13) Create room_type_detail table
14) Create room_type table
15) Create room_status table
16) Create room_price table
17) Create all tables

Press enter to return to previous Menu
------------------------------------------------
[17
```

```
SQL*Plus: Release 12.1.0.2.0 Production on Tue Nov 30 14:03:50 2021

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> SQL>   2    3    4    5
Table created.

SQL> SQL>   2    3    4    5    6    7    8    9   10
Table created.

SQL> SQL>   2    3    4    5    6    7    8    9   10
Table created.

SQL> SQL>   2    3    4    5
Table created.

SQL> SQL>   2    3    4    5    6    7    8    9   10
Table created.

SQL> SQL>   2    3    4    5    6    7    8    9   10   11
Table created.

SQL> SQL> SQL>   2    3    4    5    6    7    8
Table created.

SQL> SQL>   2    3    4    5    6
Table created.

SQL> SQL>   2    3    4    5
Table created.

SQL> SQL> SQL>   2    3    4    5    6    7    8    9
Table created.

SQL>   2    3    4    5    6    7    8    9   10   11
Table created.

SQL> SQL> SQL>   2    3    4    5    6
Table created.

SQL> SQL> SQL>   2    3    4    5    6
Table created.

SQL> SQL> SQL>   2    3    4    5    6    7    8
Table created.

SQL> SQL> SQL>   2    3    4    5    6    7
Table created.

SQL> SQL>   2    3    4    5    6    7
Table created.

SQL> SQL> Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Produ
ction
With the Partitioning, OLAP, Data Mining and Real Application Testing options
```

Next, we will populate the tables:

```
=================================================================
|              Hotel Management Database System                 |
|              CPS 510 - Group 13                               |
|---------------------------------------------------------------|
|                                                               |
| Main Menu - Select Desired Operation(s):                      |
|                                                               |
-----------------------------------------------------------------

  1) Drop Tables
  2) Create Tables
  3) Populate Tables
  4) Query Tables
  5) Show all Tables
  6) Search Table
  7) Update Table

  E) End/Exit
-----------------------------------------------------------------
 Choose:
3

------------------------------------------------
Pick an Option
------------------------------------------------
1) Insert Customer Info
2) Insert Reservation Info
3) Insert Payment Info
4) Insert parking Info
5) Insert Room Info

Press enter to return to previous Menu
------------------------------------------------
1

SQL*Plus: Release 12.1.0.2.0 Production on Tue Nov 30 14:04:25 2021

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> SQL>   2
1 row created.

SQL>   2
1 row created.

SQL> SQL> SQL>
1 row created.

SQL>   2
1 row created.

SQL> SQL>   2
1 row created.

SQL>   2
1 row created.

SQL> SQL> SQL>   2
1 row created.

SQL>   2
1 row created.

SQL> SQL>   2
1 row created.
```

We can also Query a specific table using the 4) Query Tables and inputting the table name

```
================================================================
|              Hotel Management Database System                |
|              CPS 510 - Group 13                              |
|--------------------------------------------------------------|
|                                                              |
| Main Menu - Select Desired Operation(s):                     |
|                                                              |
----------------------------------------------------------------

  1) Drop Tables
  2) Create Tables
  3) Populate Tables
  4) Query Tables
  5) Show all Tables
  6) Search Table
  7) Update Table

  E) End/Exit
------------------------------------------------------------------
 Choose:
4

------------------------------------------------
List of Tables
------------------------------------------------
 card_info table
 bill_address table
 payment table
 invoice table
 address_info table
 customer table
 reservation table
 books table
 car_info table
 parking table
 room table
 has table
 room_type_detail table
 room_type table
 room_status table
 room_price table

------------------------------------------------
 Pick an Option :
------------------------------------------------
1) Query a table
Press enter to return to previous Menu
------------------------------------------------
1
Enter Table name:
car_info

SQL*Plus: Release 12.1.0.2.0 Production on Tue Nov 30 14:08:45 2021

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL>
CUSTOMER_ID LICENSE_
----------- --------
          1 ARTV434
          3 STAR101

SQL> Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

Enter return to continue
```
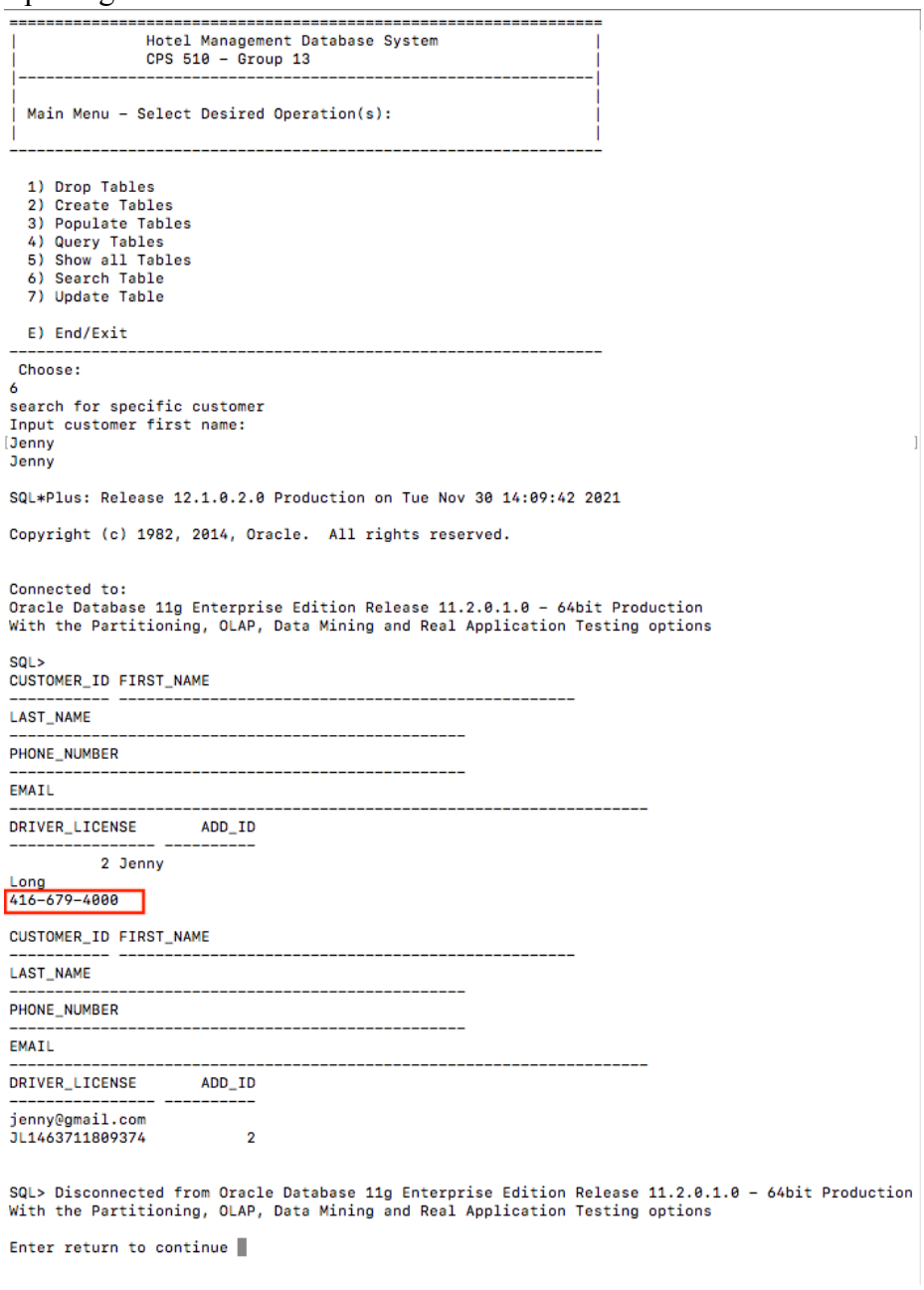

We can also search for a specific customer in the customer table using 6) search table and inputting the customers first name



```
================================================================
|              Hotel Management Database System                |
|              CPS 510 - Group 13                              |
|--------------------------------------------------------------|
|                                                              |
| Main Menu - Select Desired Operation(s):                     |
|                                                              |
----------------------------------------------------------------

  1) Drop Tables
  2) Create Tables
  3) Populate Tables
  4) Query Tables
  5) Show all Tables
  6) Search Table
  7) Update Table

  E) End/Exit
----------------------------------------------------------------
 Choose:
6
search for specific customer
Input customer first name:
Jenny
Jenny

SQL*Plus: Release 12.1.0.2.0 Production on Tue Nov 30 14:09:42 2021

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL>
CUSTOMER_ID FIRST_NAME
----------- --------------------------------------------------
LAST_NAME
--------------------------------------------------
PHONE_NUMBER
--------------------------------------------------
EMAIL
--------------------------------------------------------------------------------
DRIVER_LICENSE       ADD_ID
---------------- ----------
         2 Jenny
Long
416-679-4000

CUSTOMER_ID FIRST_NAME
----------- --------------------------------------------------
LAST_NAME
--------------------------------------------------
PHONE_NUMBER
--------------------------------------------------
EMAIL
--------------------------------------------------------------------------------
DRIVER_LICENSE       ADD_ID
---------------- ----------
jenny@gmail.com
JL1463711809374           2


SQL> Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

Enter return to continue
```
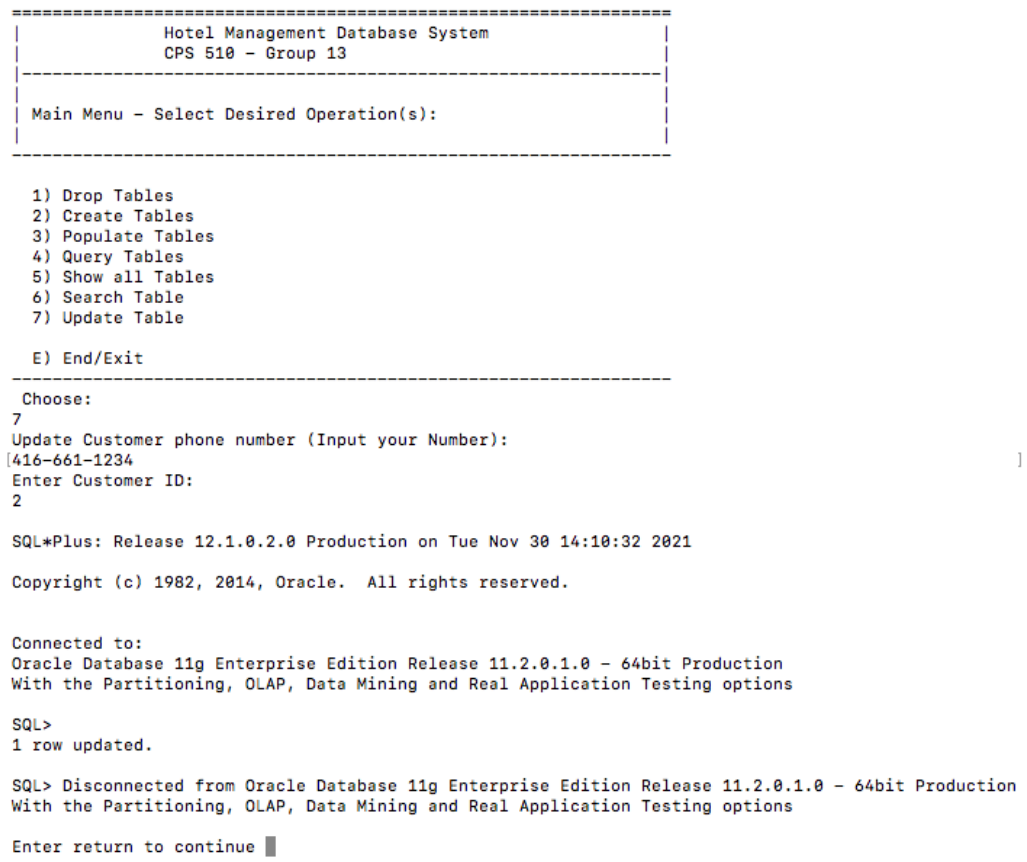

Next, we will demonstrate 7) Update table, we will update the customer's phone number (user has to input phone number and customer id.



We can double-check that the table is successfully updated by using 6) Search Table:

```
================================================================
|              Hotel Management Database System                |
|              CPS 510 - Group 13                              |
|--------------------------------------------------------------|
|                                                              |
| Main Menu - Select Desired Operation(s):                     |
|                                                              |
----------------------------------------------------------------

  1) Drop Tables
  2) Create Tables
  3) Populate Tables
  4) Query Tables
  5) Show all Tables
  6) Search Table
  7) Update Table

  E) End/Exit
----------------------------------------------------------------
 Choose:
6
search for specific customer
Input customer first name:
Jenny
Jenny

SQL*Plus: Release 12.1.0.2.0 Production on Tue Nov 30 14:33:25 2021

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL>
CUSTOMER_ID FIRST_NAME
----------- --------------------------------------------------
LAST_NAME
--------------------------------------------------
PHONE_NUMBER
--------------------------------------------------
EMAIL
--------------------------------------------------------------------------------
DRIVER_LICENSE       ADD_ID
---------------- ----------
         2 Jenny
Long
416-661-1234

CUSTOMER_ID FIRST_NAME
----------- --------------------------------------------------
LAST_NAME
--------------------------------------------------
PHONE_NUMBER
--------------------------------------------------
EMAIL
--------------------------------------------------------------------------------
DRIVER_LICENSE       ADD_ID
---------------- ----------
jenny@gmail.com
```

Finally, we can Exit the Menu by entering ‘E’:

```
================================================================
|              Hotel Management Database System                |
|              CPS 510 - Group 13                              |
|--------------------------------------------------------------|
|                                                              |
| Main Menu - Select Desired Operation(s):                     |
|                                                              |
----------------------------------------------------------------

  1) Drop Tables
  2) Create Tables
  3) Populate Tables
  4) Query Tables
  5) Show all Tables
  6) Search Table
  7) Update Table

  E) End/Exit
----------------------------------------------------------------
 Choose:
E
j29long@thebe:~/CPS510/A9$
```

Normalization, Database Schema & Content

The database is in 3NF & BCNF. The database contains sample dummy data.

Reservation Table

Reservation(reservation_ID, check_in,check_out,children,adults)

	RESERVATION_ID	CHECK_IN	CHECK_OUT	CHILDREN	ADULTS
1	1	21-09-12 14:00:00.000000000	21-09-16 12:00:00.000000000	1	2
2	2	21-10-05 10:00:00.000000000	21-10-10 12:00:00.000000000	2	0
3	3	21-12-12 19:00:00.000000000	21-12-26 13:00:00.000000000	3	1
4	4	21-10-11 12:00:00.000000000	21-12-06 13:00:00.000000000	2	6
5	5	22-01-01 12:00:00.000000000	22-01-10 12:00:00.000000000	2	0

Functional Dependencies:

reservation_ID → check_in
reservation_ID → check_out
reservation_ID → children
reservation_ID → adults

1NF- each column have unique names, atomic values and same data types in their domain
2NF- no partial dependencies,
3NF - no transitive dependencies
Super keys :{reservation_ID},{reservation_ID,check_In,check_Out}

BCNF :

1) Satisfy 3NF
2) In all cases, the left-hand side “reservation_ID” is a prime attribute and the right side is non-prime.Reservation_ID is a super key and there are no cases where a non-prime is functionally determining it.
   I.e. check_in → reservation_ID does not apply since multiple customers can have the same check_in time, so it cannot determine the reservation_ID.

Payment Table
payment(payment_ID, card_no,first_name,last_name,b_add_ID)

	PAYMENT_ID	CARD_NO	FIRST_N...	LAST_NAME	B_ADD_ID
1	1	50030012	John	Smith	1
2	2	123456	Jenny	Long	2
3	3	10000023	Jeffrey	Star	3
4	4	1000003	Patrick	Star	4
5	5	98765	Arianna	Grande	5

1NF- each column have unique names, atomic values and the same data types in their domain
2NF- no partial dependencies **3NF** - no transitive dependencies
BCNF :

1) Satisfy 3NF
2) In all cases, the left-hand side "payment_ID" is a prime attribute and the right side (card_no, first_name,last_name,B_ADD_ID) are non-prime.
   payment_ID is a super key and there are no cases where a non-prime is functionally determining it.
   I.e. card_no→ payment_ID does not apply since customers can use multiple cards to make payments.

These are tables that are divided in order to get BCNF for Payment Table:

Invoice Table
invoice(payment_ID,customer_ID)

	PAYMENT_ID	CUSTOMER_ID
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5

Functional Dependencies:
payment_ID → customer_ID

Card_info Table
card(card_no,exp_date)

	CARD_NO	EXP_DATE
1	50030012	21-01-01 00:00:00.000000000
2	123456	22-06-01 00:00:00.000000000
3	10000023	30-01-01 00:00:00.000000000
4	1000003	20-01-01 09:00:00.000000000
5	98765	23-01-09 00:00:00.000000000

Functional Dependencies:
card_no → exp_date

Bill_address Table
bill_address(b_add_ID,street_number,street_name,city,province,country,postal_code)

	B_ADD_ID	STREET_NUMBER	STREET_NAME	CITY	PROVINCE	COUNTRY	POSTAL_CODE
1	1	123	Jane St	Toronto	Ontario	Canada	M5B1B0
2	2	123	Jane St	Toronto	Ontario	Canada	M5B1B0
3	3	123	Jstar	Casper	Wyoming	USA	M5B1B0
4	4	1	Rock	Toronto	Ontario	Canada	M0B1J0
5	5	90	Hollywood	Markham	Ontario	Canada	M9K9C3

Functional Dependencies:
b_add_ID → street_name
b_add_ID → street_number
b_add_ID → city
b_add_ID → province
b_add_ID → country
b_add_ID → postal_code

1NF- each column have unique names, atomic values and same data types in their domain
2NF- no partial dependencies,
3NF - no transitive dependencies
Super keys :{reservation_ID},{reservation_ID,check_In,check_Out}

BCNF :
1) Satisfy 3NF
2) In all cases, the left-hand side "B_ADD_ID" is a prime attribute and the right side is non-prime (street_number,street_name,city,province,country,postal_code).
   B_ADD_ID is a super key and there are no cases where a non-prime is functionally determining it.
   I.e. Country → B_ADD_ID does not apply, as shown in the table there are multiple customers who live in Canada so they cannot functionally determine B_ADD_ID.

Parking Table
Parking_Info(parking_ID,customer_ID,parking_lvl,parking_avail)

	CUSTOMER_ID	PARKING_ID	PARKING_LVL	PARKING_AVAIL
1	1	1	2	1
2	3	2	3	1

Functional Dependencies:
parking_ID → parking_lvl
parking_ID → parking_avail
1NF- each column have unique names, atomic values and the same data types in their domain
2NF- no partial dependencies, **3NF** - no transitive dependencies
BCNF:
1) Satisfies 3NF requirement

2) In all cases, the left-hand side "parking_ID" is a prime attribute and the right side is non-prime (parking_lvl,parking_avail,customer_ID).
Parking_ID is a super key and there are no cases where a non-prime is functionally determining it.
I.e. parking_avail → parking_ID does not apply, as shown in the table there are two cars that are in the parking lot and the spots are both available as indicated by the value 1. These values do not determine the parking_ID

This is the table that is divided in order to get BCNF for Parking Table:

Car_info Table
car_info(customer_ID,License_plate)

	CUSTOMER_ID	LICENSE_PLATE
1	1	ARTV434
2	3	STAR101

Customer Table
customer(customer_ID,first_name,last_name,phone_number,email,driver_license, add_ID)

	CUSTOMER_ID	FIRST_NAME	LAST_NAME	PHONE_NUMBER	EMAIL	DRIVER_LICENSE	ADD_ID
1	1	John	Smith	416-979-5000	johnsmith@gmail.com	U51463711809374	1
2	2	Jenny	Long	416-123-0000	jenny@gmail.com	JL1463711809374	2
3	3	Jeffrey	Star	416-222-1000	jstar@gmail.com	809374JS	3
4	4	Spongebob	Squarepant	416-100-1234	spongebob@gmail.com	SB1234	4
5	5	Arianna	Grande	416-900-6789	ag@gmail.com	ag1234	5

Functional Dependencies:
Customer_ID →First_Name
Customer_ID →Last_Name
Customer_ID → Phone_number
Customer_ID → Email
Customer_ID → Driver_License
Customer_ID → Postal_Code
Customer_ID→ Add-ID

1NF- each column have unique names, atomic values and the same data types in their domain
2NF- no partial dependencies, **3NF** - no transitive dependencies
BCNF:

3) Satisfies 3NF requirement
4) In all cases, the left-hand side "customer_ID" is a prime attribute and the right side is non-prime (first_name,last_name,phone_number,email,driver_license, add_ID).
Customer_ID is a super key and there are no cases where a non-prime is functionally determining it.
I.e. first_name → customer_ID does not apply, as there can be multiple customers with the same first name so they cannot determine the customer_ID

This is the table that is divided in order to get BCNF for Customer Table:

Address_info Table
address_into(add_ID,street_number,street_name,city,province,country,postal_code)

	ADD_ID	STREET_NUMBER	STREET_NAME	CITY	PROVINCE	COUNTRY	POSTAL_CODE
1	1	123	Jane St	Toronto	Ontario	Canada	M5B1B0
2	2	456	Keele St West	Toronto	Ontario	Canada	M2N1B6
3	3	1000	Burnaby	Vancouver	British Columbia	Canada	M7K1B3
4	4	100	Pineapple Bottom	Etobicoke	Ontario	Canada	M0J9B3
5	5	90	Hollywood	Markham	Ontario	Canada	M9K9C3

Functional Dependencies:
Add_ID →Street_Number
Add_ID →Street_Name
Add_ID → City
Add_ID → Province
Add_ID → Country
Add_ID → Postal_code

1NF- each column have unique names, atomic values and the same data types in their domain
2NF- no partial dependencies, **3NF** - no transitive dependencies
BCNF:

5) Satisfies 3NF requirement
6) In all cases, the left-hand side "ADD_ID" is a prime attribute and the right side is non-prime (street_number,street_name,city,province,country,postal_code).
ADD_ID is a super key and there are no cases where a non-prime is functionally determining it.
I.e. Country → ADD_ID does not apply, as shown in the table there are multiple rows that contain Canada as the country hence its not able to determine Add_ID.

Has Table
has(room_ID,reservation_ID)

	ROOM_ID	RESERVATION_ID
1	101	1
2	102	2
3	103	3
4	400	4
5	500	5

Room and reservation table has a many-to-many relationship since there are many rooms and many reservations. Therefore it's clear that no functional dependencies hold for this relationship.

Books Table

book(customer_ID,reservation_ID)

	CUSTOMER_ID	RESERVATION_ID
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5

Customer and reservation table has a many-to-many relationship since many customers can make many reservations. Therefore it's clear that no functional dependencies hold for this relationship.

Room Table

Room(room_ID,reservation_ID,room_service,TV,room_view,fridge,room_cap)

	ROOM_ID	RESERVATIO...	ROOM_SERVICE	TV	ROOM_VIEW	FRIDGE	ROOM_CAP
1	101	1	None	0	Falls	1	4
2	102	2	None	1	City	1	2
3	103	3	Star Package	1	Falls	1	6
4	400	4	All you can eat Buffet	0	City	1	2
5	500	5	Star Package	0	Falls	1	2

Functional Dependencies:

room_ID → room_service
room_ID → TV
room_ID → room_view
room_ID → fridge
room_ID → room_cap

1NF- each column have unique names, atomic values and the same data types in their domain
2NF- no partial dependencies **3NF** - no transitive dependencies
BCNF:

1. Satisfies 3NF requirement
2. In all the functional dependencies, 'room_ID' on the LHS is a prime attribute. Attributes on the RHS (room_service, TV, room_view, fridge, room_cap) are all non-prime attributes.
   Room_ID is a super key and we don't have an instance where any non-prime attribute functionally determines Room_ID.

Room_price Table
room_price(room_ID,room_type_ID,price)

	ROOM_ID	ROOM_TYPE_ID	PRICE
1	101	1	300
2	102	2	100
3	103	3	1000
4	400	4	90
5	500	5	1500

Functional Dependencies:
Room_type_ID → price (FD)

1NF- each column have unique names, atomic values and the same data types in their domain
2NF- no partial dependencies **3NF** - no transitive dependencies
BCNF:

1. Satisfies 3NF requirement
2. The only functional dependency we have is 'Room_type_ID' on the LHS as a prime attribute. Price Attribute on the RHS is a non-prime attribute.
   Room_type_ID is a super key and it is not functionally dependent on price.

Room_status Table
room_status(room_status_ID, room_ID,room_avail)

	ROOM_ID	ROOM_STATUS_ID	ROOM_AVAIL
1	101	1	1
2	102	1	1
3	103	1	1
4	400	1	1
5	500	1	0

Functional Dependencies:
Room_status_ID →room_avail (FD)

1NF- each column have unique names, atomic values and same data types in their domain
2NF- no partial dependencies **3NF** - no transitive dependencies
BCNF:

1. Satisfies 3NF requirement
2. The only functional dependency we have is 'Room_status_ID' on the LHS as a prime attribute. Room_avail Attribute on the RHS is a non-prime attribute.
   Room_status_ID is a super key and it is not functionally dependent on price.

Room_type Table

room_type(Room_type _ID, Room_ID ,Room_type_name)

	ROOM_ID	ROOM_TYPE_ID	R_T_ID
1	101	1	1
2	102	2	2
3	103	3	3
4	400	4	4
5	500	5	5

Functional Dependencies:

Room_type _ID → Room_type_name

Room_type_ID → Room_ID

1NF- each column have unique names, atomic values and the same data types in their domain

2NF- no partial dependencies,

3NF - no transitive dependencies

BCNF :

1) Satisfy 3NF
2) there are no cases where a non-prime is functionally determining the prime keys.

This is the table that is divided in order to get BCNF for Room type Table:

Room_type_detail Table

room_type_detail(Room_type_name, smoking)

	R_T_ID	ROOM_TYPE_NAME	SMOKING
1	1	Suite	0
2	2	Suite	0
3	3	Presidential Suite	0
4	4	Single	1
5	5	Penthouse Suite	1

Functional Dependencies:

Room_type_name → smoking