Austin Therapy Clinic Database in MySQL

Project Documentation

Arturo Arriaga
Ara872@.g.harvard.edu
Harvard University – Extension School
CSCI E-59 Designing and Developing Relational and NoSQL Databases
Professor Greg Misicko

Table of Contents

Project Description: The Austin Therapy Clinic database recreates the functionality of a hypothetical a speech - language pathology clinic set in Austin, Texas. The motivation for this project comes from my background working in speech pathology before learning to program and enrolling in the extension school to pursue my ALM in Software Engineering. This database was created in MySQL hosted in an EC2 instance using Amazon Web Services. The database has 9 tables with 14,000+ data entries that breakdown into 5 clinic locations, 35 therapists, 150 clients, 7180 sessions and 7180 generated billing records for each session.

Video Reference:
Repository

Entities: The main entities of this project are:

- Clinics – The location where treatment/services are performed.
- Therapists – The clinician and information related to their credentials, specialty and language.
- Clients – The clients that receive treatment in this clinic.
- Sessions – A therapy session and its related information.
- Billing Records – A record that maps to a therapy session used by the clinic to bill for services.
- Languages – The languages of both the therapists and clients.
- Diagnosis – The diagnosis of the client who this clinic services. Maps to the specialty of a therapist.
- Billing Codes – The codes that represents the service this clinic offers.
- Billing Status – The status of a billing record that describes if a service has been paid for, is pending or was canceled and refunded back to the client.

Relationships: Some of the primary relationships between entities:

- Therapists and Clients – from the database design we can see that the therapists and clients both share a relationship to the languages and diagnosis tables. The therapist has a specialty and can deliver treatment in a language that can be mapped to a client’s needs. Queries against the data were implemented to reflect this relationship.
- Sessions and Billing records – In the design we can all see that the sessions relationship to the billing records the clinic uses to bill for services.
- Sessions, Locations, Therapists, Clients – We also see a relationship from the sessions table to the clinic where the service occurred, the treating therapist and the client that was treated. Queries were made to reflect this relationship.

Scalability

Pros

The design of this schema allows for the database to scale with data entries in the following ways:

1. New locations could be added to the clinics table if the clinic would like to expand.
2. Therapists and clients could be added easily.
3. New languages and billing codes could be added easily.

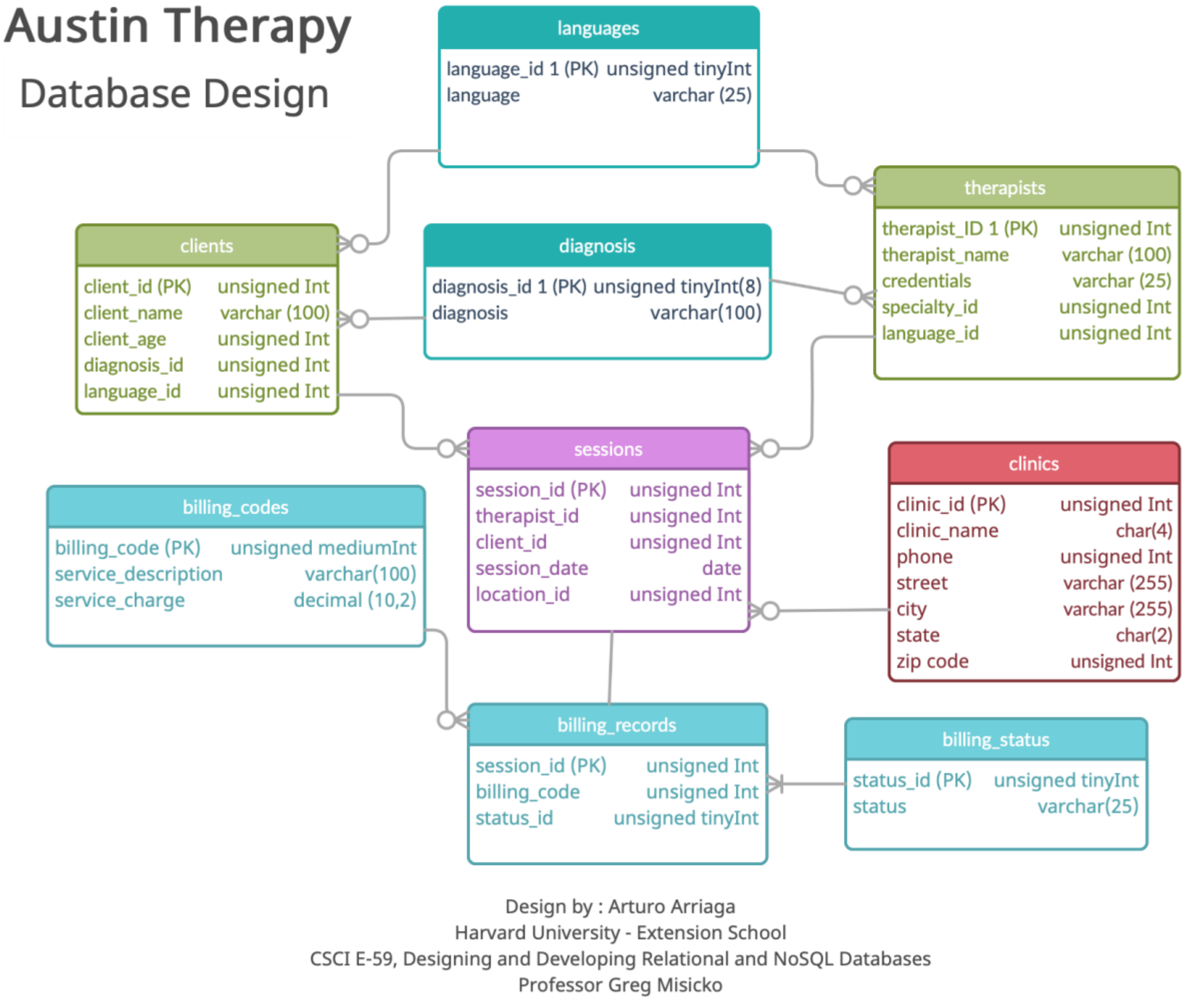
Cons

The downside of using a relational database is the rigid structure. One issue found with this database is that it will not provide the flexibility needed to insert more dynamic entries into the sessions table. For example, the clinic would likely want to track more data like therapists’ observations, comments, client goals and performance in therapy sessions. This type of data would be much more dynamic as there would be wide variance between each client and session. Entries if this type would vary between 10-20 words to 200-500 words per session. If this clinic treats 150 and each client receives 2 sessions per week, that generates over 40,000 records in one year. Meaning the scale of data would increase exponentially as the clinic expands and perhaps putting strain on the database as this scale occurs.

Procedures and Development Process

Schema Design

Creating a schema design was done in multiple iterations. First, defining the entities and relationships listed above, created a baseline of data to track. The site https://creately.com was used to turn the definitions into a schema with more definition. The following page shows the results this design.



Austin Therapy

Database Design

languages	
language_id 1 (PK)	unsigned tinyInt
language	varchar (25)

therapists	
therapist_ID 1 (PK)	unsigned Int
therapist_name	varchar (100)
credentials	varchar (25)
specialty_id	unsigned Int
language_id	unsigned Int

clients	
client_id (PK)	unsigned Int
client_name	varchar (100)
client_age	unsigned Int
diagnosis_id	unsigned Int
language_id	unsigned Int

diagnosis	
diagnosis_id 1 (PK)	unsigned tinyInt(8)
diagnosis	varchar(100)

sessions	
session_id (PK)	unsigned Int
therapist_id	unsigned Int
client_id	unsigned Int
session_date	date
location_id	unsigned Int

clinics	
clinic_id (PK)	unsigned Int
clinic_name	char(4)
phone	unsigned Int
street	varchar (255)
city	varchar (255)
state	char(2)
zip code	unsigned Int

billing_codes	
billing_code (PK)	unsigned mediumInt
service_description	varchar(100)
service_charge	decimal (10,2)

billing_records	
session_id (PK)	unsigned Int
billing_code	unsigned Int
status_id	unsigned tinyInt

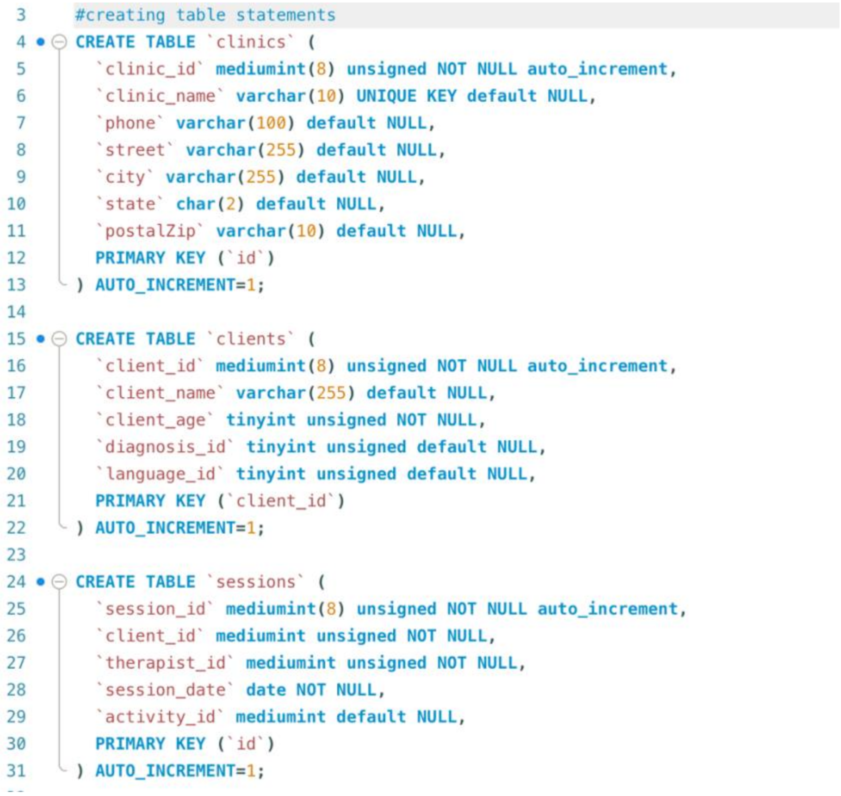
billing_status	
status_id (PK)	unsigned tinyInt
status	varchar(25)

Design by : Arturo Arriaga
Harvard University - Extension School
CSCI E-59, Designing and Developing Relational and NoSQL Databases
Professor Greg Misicko

Database Creation within MySQL

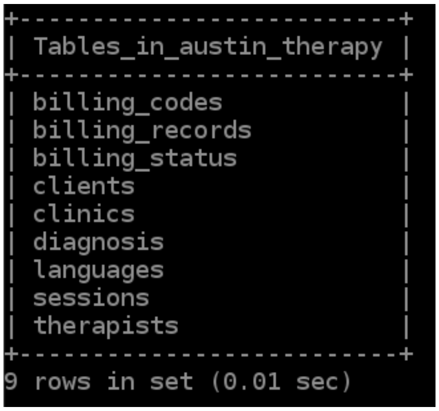
Creating the database within MySQL used a combination of MySQL Workspace and EC2 from Amazon Webservices. MySQL was used to formulate the create statements and then they were copied/pasted directly into an EC2 instance running MySQL.

Below are screenshots of the statements used to create the tables.



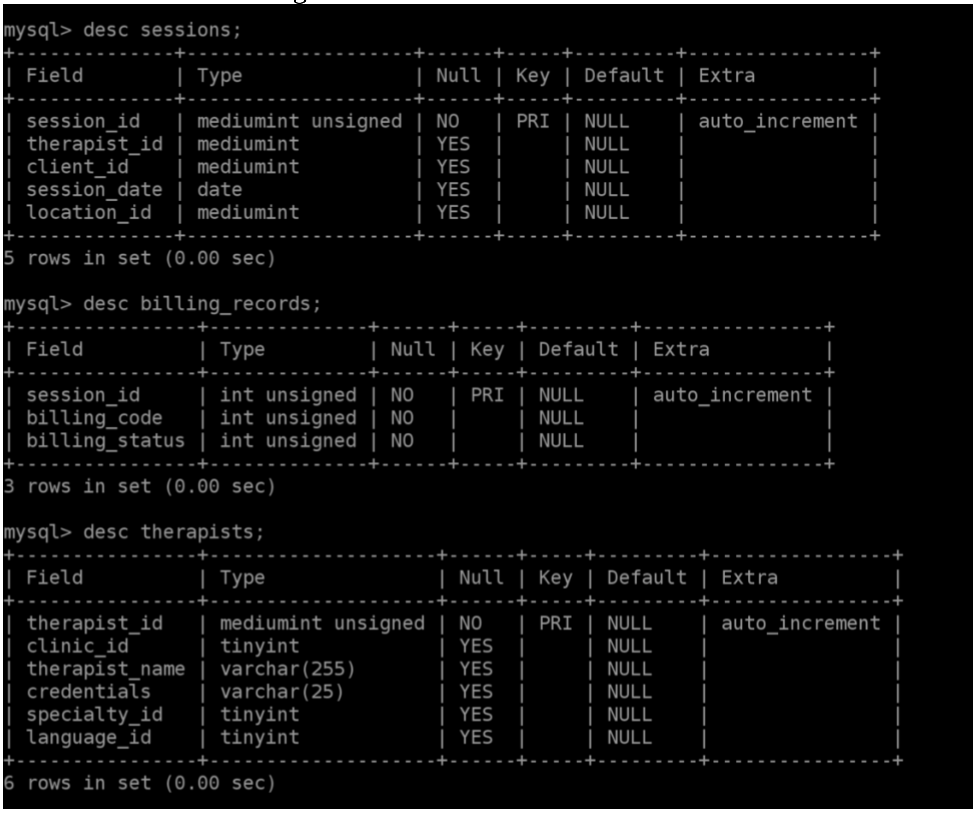
```
#creating table statements
CREATE TABLE `clinics` (
  `clinic_id` mediumint(8) unsigned NOT NULL auto_increment,
  `clinic_name` varchar(10) UNIQUE KEY default NULL,
  `phone` varchar(100) default NULL,
  `street` varchar(255) default NULL,
  `city` varchar(255) default NULL,
  `state` char(2) default NULL,
  `postalZip` varchar(10) default NULL,
  PRIMARY KEY (`id`)
) AUTO_INCREMENT=1;

CREATE TABLE `clients` (
  `client_id` mediumint(8) unsigned NOT NULL auto_increment,
  `client_name` varchar(255) default NULL,
  `client_age` tinyint unsigned NOT NULL,
  `diagnosis_id` tinyint unsigned default NULL,
  `language_id` tinyint unsigned default NULL,
  PRIMARY KEY (`client_id`)
) AUTO_INCREMENT=1;

CREATE TABLE `sessions` (
  `session_id` mediumint(8) unsigned NOT NULL auto_increment,
  `client_id` mediumint unsigned NOT NULL,
  `therapist_id` mediumint unsigned NOT NULL,
  `session_date` date NOT NULL,
  `activity_id` mediumint default NULL,
  PRIMARY KEY (`id`)
) AUTO_INCREMENT=1;
```

This screenshot shows the tables after they were created in MySQL.

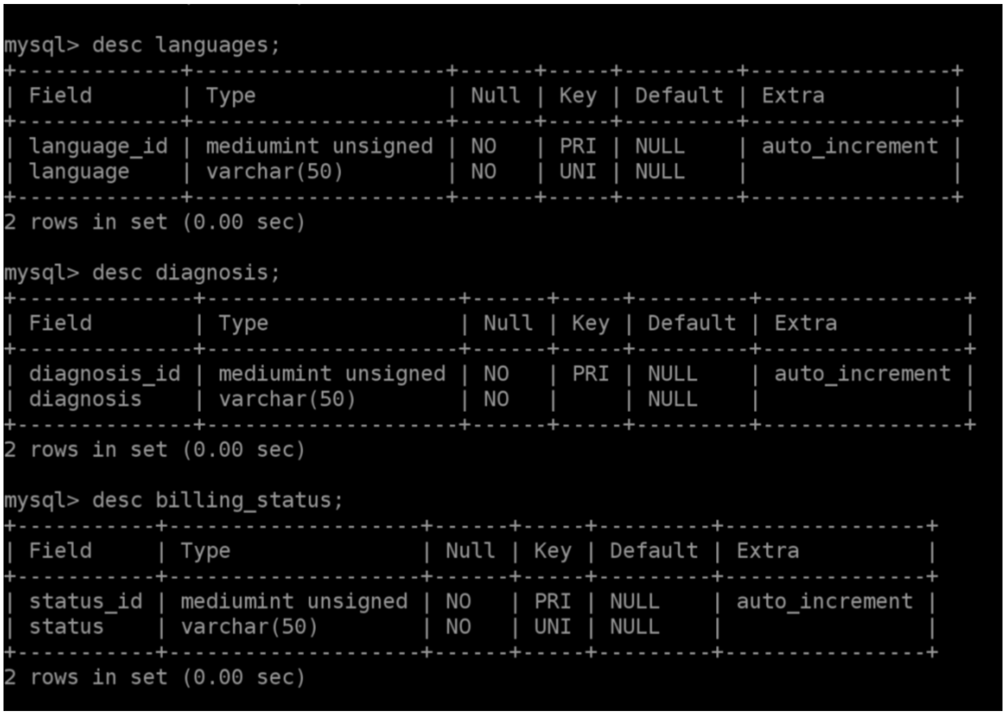


```
+-------------------------+
| Tables_in_austin_therapy |
+-------------------------+
| billing_codes            |
| billing_records          |
| billing_status           |
| clients                  |
| clinics                  |
| diagnosis                |
| languages                |
| sessions                 |
| therapists               |
+-------------------------+
9 rows in set (0.01 sec)
```

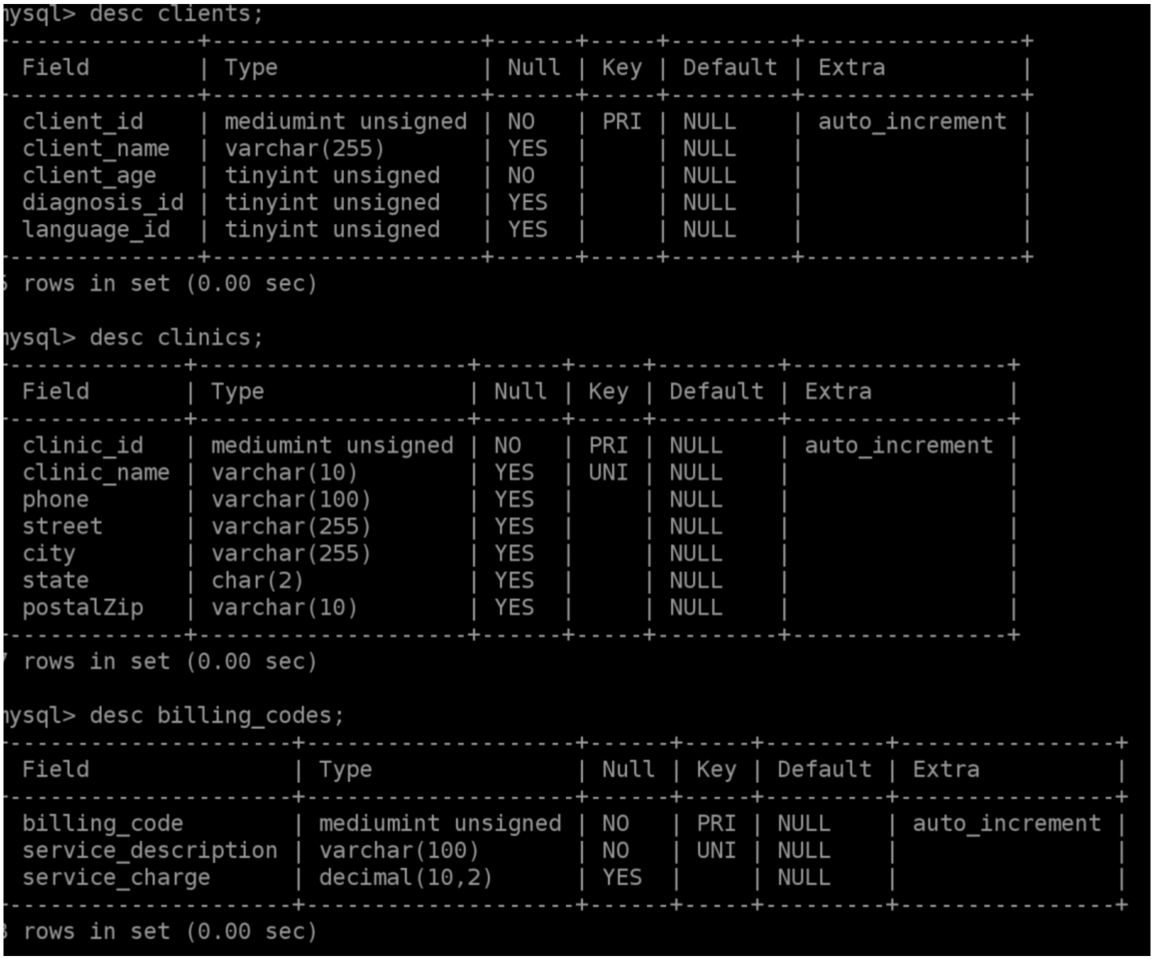
The following screenshots show a description of each table within MySQL. Note that each description matches the schema design.



```
mysql> desc sessions;
+--------------+--------------------+------+-----+---------+----------------+
| Field        | Type               | Null | Key | Default | Extra          |
+--------------+--------------------+------+-----+---------+----------------+
| session_id   | mediumint unsigned | NO   | PRI | NULL    | auto_increment |
| therapist_id | mediumint          | YES  |     | NULL    |                |
| client_id    | mediumint          | YES  |     | NULL    |                |
| session_date | date               | YES  |     | NULL    |                |
| location_id  | mediumint          | YES  |     | NULL    |                |
+--------------+--------------------+------+-----+---------+----------------+
5 rows in set (0.00 sec)

mysql> desc billing_records;
+----------------+--------------+------+-----+---------+----------------+
| Field          | Type         | Null | Key | Default | Extra          |
+----------------+--------------+------+-----+---------+----------------+
| session_id     | int unsigned | NO   | PRI | NULL    | auto_increment |
| billing_code   | int unsigned | NO   |     | NULL    |                |
| billing_status | int unsigned | NO   |     | NULL    |                |
+----------------+--------------+------+-----+---------+----------------+
3 rows in set (0.00 sec)

mysql> desc therapists;
+----------------+--------------------+------+-----+---------+----------------+
| Field          | Type               | Null | Key | Default | Extra          |
+----------------+--------------------+------+-----+---------+----------------+
| therapist_id   | mediumint unsigned | NO   | PRI | NULL    | auto_increment |
| clinic_id      | tinyint            | YES  |     | NULL    |                |
| therapist_name | varchar(255)       | YES  |     | NULL    |                |
| credentials    | varchar(25)        | YES  |     | NULL    |                |
| specialty_id   | tinyint            | YES  |     | NULL    |                |
| language_id    | tinyint            | YES  |     | NULL    |                |
+----------------+--------------------+------+-----+---------+----------------+
6 rows in set (0.00 sec)
```



```
mysql> desc languages;
+-------------+--------------------+------+-----+---------+----------------+
| Field       | Type               | Null | Key | Default | Extra          |
+-------------+--------------------+------+-----+---------+----------------+
| language_id | mediumint unsigned | NO   | PRI | NULL    | auto_increment |
| language    | varchar(50)        | NO   | UNI | NULL    |                |
+-------------+--------------------+------+-----+---------+----------------+
2 rows in set (0.00 sec)

mysql> desc diagnosis;
+--------------+--------------------+------+-----+---------+----------------+
| Field        | Type               | Null | Key | Default | Extra          |
+--------------+--------------------+------+-----+---------+----------------+
| diagnosis_id | mediumint unsigned | NO   | PRI | NULL    | auto_increment |
| diagnosis    | varchar(50)        | NO   |     | NULL    |                |
+--------------+--------------------+------+-----+---------+----------------+
2 rows in set (0.00 sec)

mysql> desc billing_status;
+-----------+--------------------+------+-----+---------+----------------+
| Field     | Type               | Null | Key | Default | Extra          |
+-----------+--------------------+------+-----+---------+----------------+
| status_id | mediumint unsigned | NO   | PRI | NULL    | auto_increment |
| status    | varchar(50)        | NO   | UNI | NULL    |                |
+-----------+--------------------+------+-----+---------+----------------+
2 rows in set (0.00 sec)
```

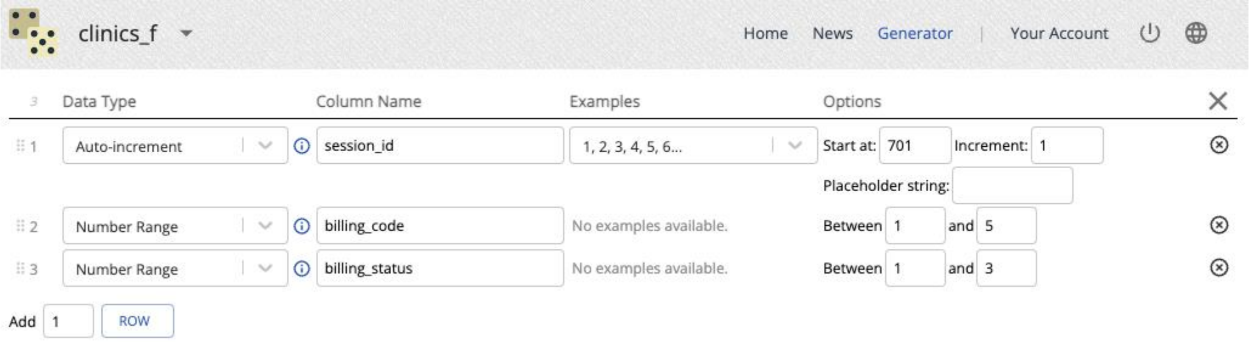


```
ysql> desc clients;
--------------+--------------------+------+-----+---------+----------------+
 Field        | Type               | Null | Key | Default | Extra          |
--------------+--------------------+------+-----+---------+----------------+
 client_id    | mediumint unsigned | NO   | PRI | NULL    | auto_increment |
 client_name  | varchar(255)       | YES  |     | NULL    |                |
 client_age   | tinyint unsigned   | NO   |     | NULL    |                |
 diagnosis_id | tinyint unsigned   | YES  |     | NULL    |                |
 language_id  | tinyint unsigned   | YES  |     | NULL    |                |
--------------+--------------------+------+-----+---------+----------------+
 rows in set (0.00 sec)

ysql> desc clinics;
-------------+--------------------+------+-----+---------+----------------+
 Field       | Type               | Null | Key | Default | Extra          |
-------------+--------------------+------+-----+---------+----------------+
 clinic_id   | mediumint unsigned | NO   | PRI | NULL    | auto_increment |
 clinic_name | varchar(10)        | YES  | UNI | NULL    |                |
 phone       | varchar(100)       | YES  |     | NULL    |                |
 street      | varchar(255)       | YES  |     | NULL    |                |
 city        | varchar(255)       | YES  |     | NULL    |                |
 state       | char(2)            | YES  |     | NULL    |                |
 postalZip   | varchar(10)        | YES  |     | NULL    |                |
-------------+--------------------+------+-----+---------+----------------+
 rows in set (0.00 sec)

ysql> desc billing_codes;
---------------------+--------------------+------+-----+---------+----------------+
 Field               | Type               | Null | Key | Default | Extra          |
---------------------+--------------------+------+-----+---------+----------------+
 billing_code        | mediumint unsigned | NO   | PRI | NULL    | auto_increment |
 service_description | varchar(100)       | NO   | UNI | NULL    |                |
 service_charge      | decimal(10,2)      | YES  |     | NULL    |                |
---------------------+--------------------+------+-----+---------+----------------+
 rows in set (0.00 sec)
```

Data Generation

The data for this project was generated using the following website: generatedata.com. The site allows users to create tables and data types and then uses random generation to populate the rows. The results were downloaded as a .sql file and then copy/pasted into MySQL directly. The site offers free functionality and unlimited data generation for a small fee.

A screenshot of the data generation process.



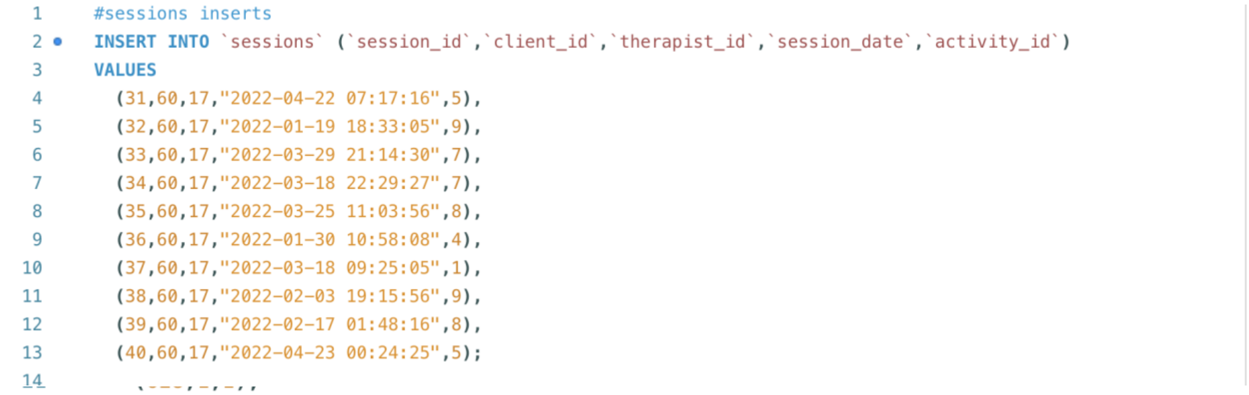
	Data Type	Column Name	Examples	Options
1	Auto-increment	session_id	1, 2, 3, 4, 5, 6...	Start at: 701 Increment: 1 Placeholder string:
2	Number Range	billing_code	No examples available.	Between 1 and 5
3	Number Range	billing_status	No examples available.	Between 1 and 3

Add 1 ROW

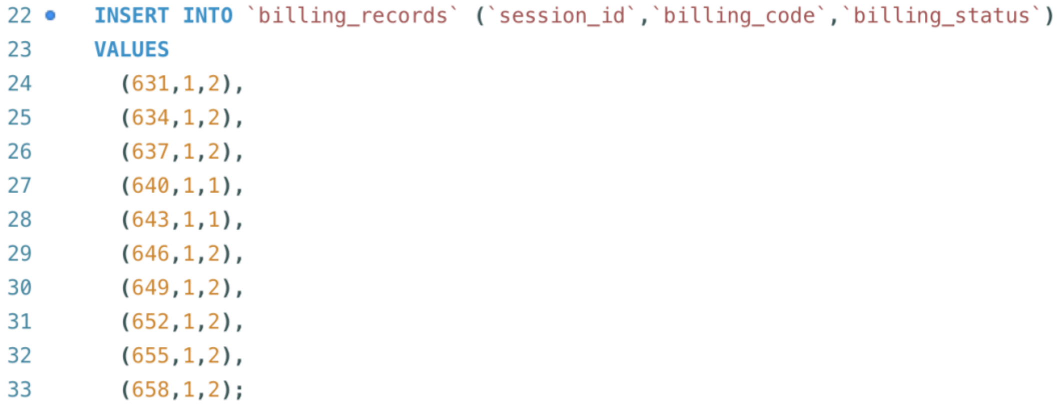
Data Insertion

With data generation complete, MySQL Workbench was used to organize the insert statements and clean up the data. The data was then manually entered into MySQL via AWS/EC2.

Some of the insert statements are shown below.



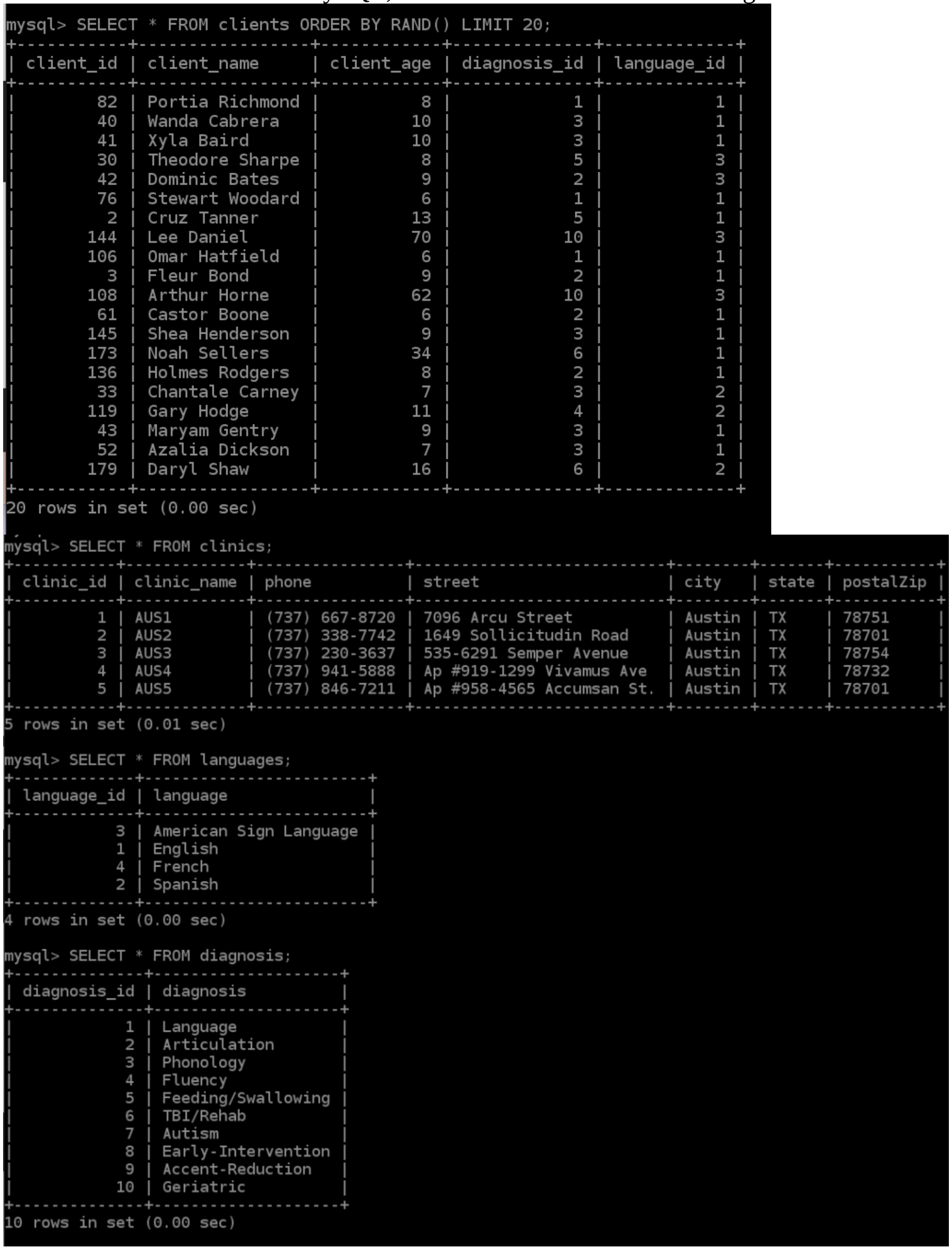
```
#sessions inserts
INSERT INTO `sessions` (`session_id`,`client_id`,`therapist_id`,`session_date`,`activity_id`)
VALUES
  (31,60,17,"2022-04-22 07:17:16",5),
  (32,60,17,"2022-01-19 18:33:05",9),
  (33,60,17,"2022-03-29 21:14:30",7),
  (34,60,17,"2022-03-18 22:29:27",7),
  (35,60,17,"2022-03-25 11:03:56",8),
  (36,60,17,"2022-01-30 10:58:08",4),
  (37,60,17,"2022-03-18 09:25:05",1),
  (38,60,17,"2022-02-03 19:15:56",9),
  (39,60,17,"2022-02-17 01:48:16",8),
  (40,60,17,"2022-04-23 00:24:25",5);
```



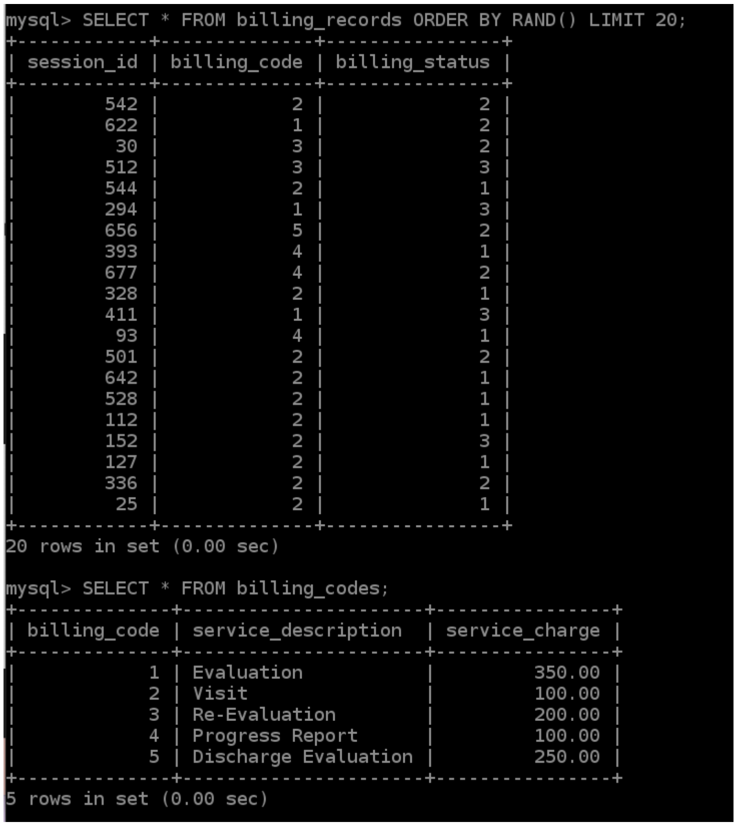
```
INSERT INTO `billing_records` (`session_id`,`billing_code`,`billing_status`)
VALUES
  (631,1,2),
  (634,1,2),
  (637,1,2),
  (640,1,1),
  (643,1,1),
  (646,1,2),
  (649,1,2),
  (652,1,2),
  (655,1,2),
  (658,1,2);
```

Data Presentation

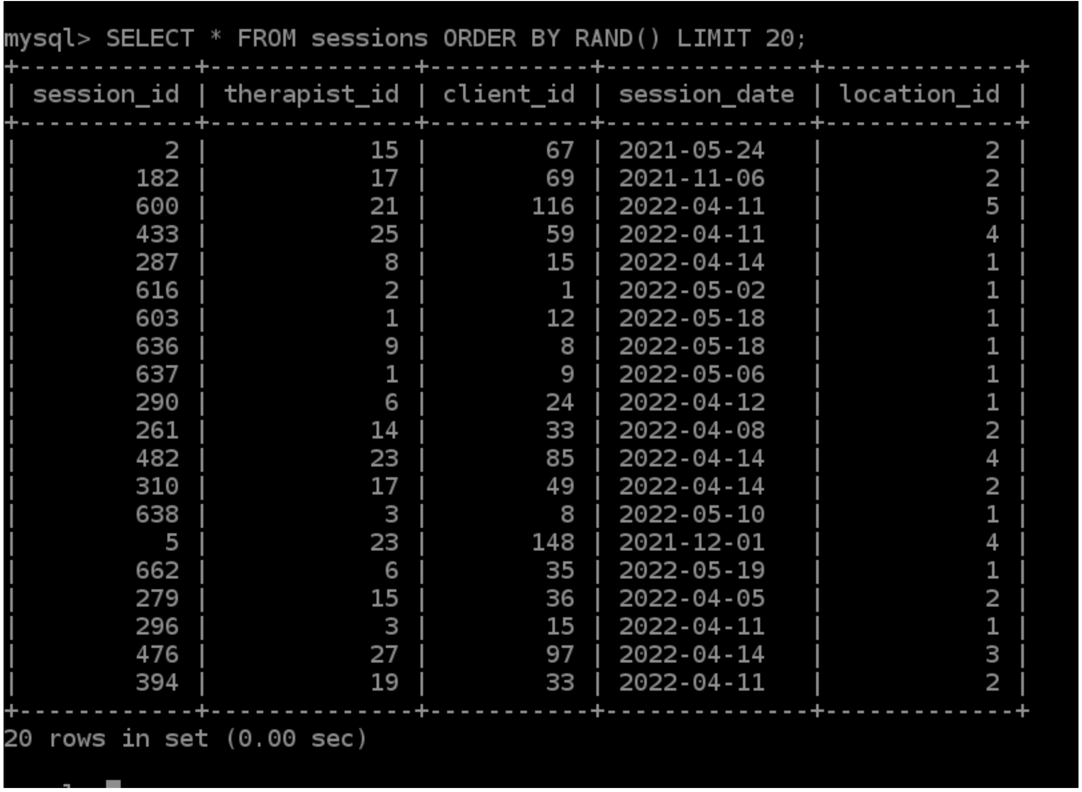
After data was inserted into MySQL, SELECT statements were used against each table view the results.



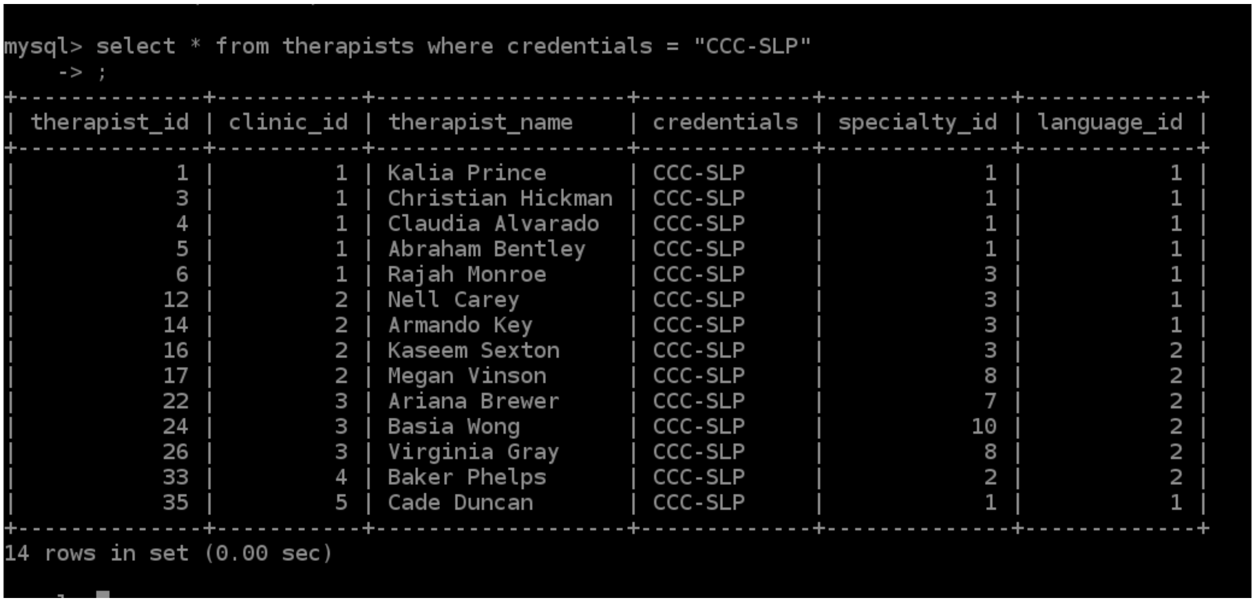
```
mysql> SELECT * FROM clients ORDER BY RAND() LIMIT 20;
+-----------+-----------------+------------+--------------+-------------+
| client_id | client_name     | client_age | diagnosis_id | language_id |
+-----------+-----------------+------------+--------------+-------------+
|        82 | Portia Richmond |          8 |            1 |           1 |
|        40 | Wanda Cabrera   |         10 |            3 |           1 |
|        41 | Xyla Baird      |         10 |            3 |           1 |
|        30 | Theodore Sharpe |          8 |            5 |           3 |
|        42 | Dominic Bates   |          9 |            2 |           3 |
|        76 | Stewart Woodard |          6 |            1 |           1 |
|         2 | Cruz Tanner     |         13 |            5 |           1 |
|       144 | Lee Daniel      |         70 |           10 |           3 |
|       106 | Omar Hatfield   |          6 |            1 |           1 |
|         3 | Fleur Bond      |          9 |            2 |           1 |
|       108 | Arthur Horne    |         62 |           10 |           3 |
|        61 | Castor Boone    |          6 |            2 |           1 |
|       145 | Shea Henderson  |          9 |            3 |           1 |
|       173 | Noah Sellers    |         34 |            6 |           1 |
|       136 | Holmes Rodgers  |          8 |            2 |           1 |
|        33 | Chantale Carney |          7 |            3 |           2 |
|       119 | Gary Hodge      |         11 |            4 |           2 |
|        43 | Maryam Gentry   |          9 |            3 |           1 |
|        52 | Azalia Dickson  |          7 |            3 |           1 |
|       179 | Daryl Shaw      |         16 |            6 |           2 |
+-----------+-----------------+------------+--------------+-------------+
20 rows in set (0.00 sec)

mysql> SELECT * FROM clinics;
+-----------+-------------+----------------+---------------------------+--------+-------+-----------+
| clinic_id | clinic_name | phone          | street                    | city   | state | postalZip |
+-----------+-------------+----------------+---------------------------+--------+-------+-----------+
|         1 | AUS1        | (737) 667-8720 | 7096 Arcu Street          | Austin | TX    | 78751     |
|         2 | AUS2        | (737) 338-7742 | 1649 Sollicitudin Road    | Austin | TX    | 78701     |
|         3 | AUS3        | (737) 230-3637 | 535-6291 Semper Avenue    | Austin | TX    | 78754     |
|         4 | AUS4        | (737) 941-5888 | Ap #919-1299 Vivamus Ave  | Austin | TX    | 78732     |
|         5 | AUS5        | (737) 846-7211 | Ap #958-4565 Accumsan St. | Austin | TX    | 78701     |
+-----------+-------------+----------------+---------------------------+--------+-------+-----------+
5 rows in set (0.01 sec)

mysql> SELECT * FROM languages;
+-------------+------------------------+
| language_id | language               |
+-------------+------------------------+
|           3 | American Sign Language |
|           1 | English                |
|           4 | French                 |
|           2 | Spanish                |
+-------------+------------------------+
4 rows in set (0.00 sec)

mysql> SELECT * FROM diagnosis;
+--------------+--------------------+
| diagnosis_id | diagnosis          |
+--------------+--------------------+
|            1 | Language           |
|            2 | Articulation       |
|            3 | Phonology          |
|            4 | Fluency            |
|            5 | Feeding/Swallowing |
|            6 | TBI/Rehab          |
|            7 | Autism             |
|            8 | Early-Intervention |
|            9 | Accent-Reduction   |
|           10 | Geriatric          |
+--------------+--------------------+
10 rows in set (0.00 sec)
```



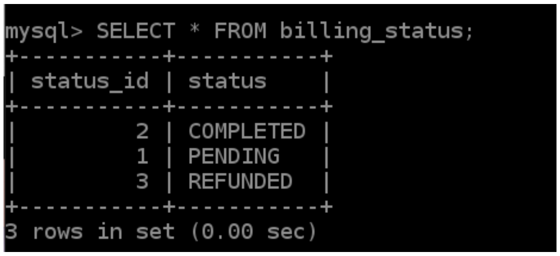
```
mysql> SELECT * FROM billing_records ORDER BY RAND() LIMIT 20;
+------------+--------------+----------------+
| session_id | billing_code | billing_status |
+------------+--------------+----------------+
|        542 |            2 |              2 |
|        622 |            1 |              2 |
|         30 |            3 |              2 |
|        512 |            3 |              3 |
|        544 |            2 |              1 |
|        294 |            1 |              3 |
|        656 |            5 |              2 |
|        393 |            4 |              1 |
|        677 |            4 |              2 |
|        328 |            2 |              1 |
|        411 |            1 |              3 |
|         93 |            4 |              1 |
|        501 |            2 |              2 |
|        642 |            2 |              1 |
|        528 |            2 |              1 |
|        112 |            2 |              1 |
|        152 |            2 |              3 |
|        127 |            2 |              1 |
|        336 |            2 |              2 |
|         25 |            2 |              1 |
+------------+--------------+----------------+
20 rows in set (0.00 sec)

mysql> SELECT * FROM billing_codes;
+--------------+----------------------+----------------+
| billing_code | service_description  | service_charge |
+--------------+----------------------+----------------+
|            1 | Evaluation           |         350.00 |
|            2 | Visit                |         100.00 |
|            3 | Re-Evaluation        |         200.00 |
|            4 | Progress Report      |         100.00 |
|            5 | Discharge Evaluation |         250.00 |
+--------------+----------------------+----------------+
5 rows in set (0.00 sec)
```



```
mysql> SELECT * FROM sessions ORDER BY RAND() LIMIT 20;
+------------+--------------+-----------+--------------+-------------+
| session_id | therapist_id | client_id | session_date | location_id |
+------------+--------------+-----------+--------------+-------------+
|          2 |           15 |        67 | 2021-05-24   |           2 |
|        182 |           17 |        69 | 2021-11-06   |           2 |
|        600 |           21 |       116 | 2022-04-11   |           5 |
|        433 |           25 |        59 | 2022-04-11   |           4 |
|        287 |            8 |        15 | 2022-04-14   |           1 |
|        616 |            2 |         1 | 2022-05-02   |           1 |
|        603 |            1 |        12 | 2022-05-18   |           1 |
|        636 |            9 |         8 | 2022-05-18   |           1 |
|        637 |            1 |         9 | 2022-05-06   |           1 |
|        290 |            6 |        24 | 2022-04-12   |           1 |
|        261 |           14 |        33 | 2022-04-08   |           2 |
|        482 |           23 |        85 | 2022-04-14   |           4 |
|        310 |           17 |        49 | 2022-04-14   |           2 |
|        638 |            3 |         8 | 2022-05-10   |           1 |
|          5 |           23 |       148 | 2021-12-01   |           4 |
|        662 |            6 |        35 | 2022-05-19   |           1 |
|        279 |           15 |        36 | 2022-04-05   |           2 |
|        296 |            3 |        15 | 2022-04-11   |           1 |
|        476 |           27 |        97 | 2022-04-14   |           3 |
|        394 |           19 |        33 | 2022-04-11   |           2 |
+------------+--------------+-----------+--------------+-------------+
20 rows in set (0.00 sec)

mysql>
```

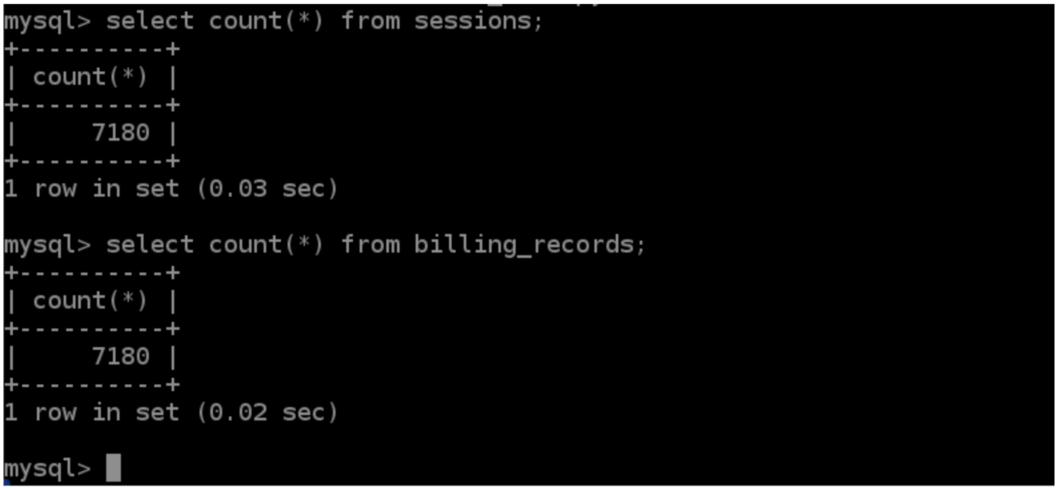


```
mysql> select * from therapists where credentials = "CCC-SLP"
    -> ;
+--------------+-----------+-------------------+-------------+--------------+-------------+
| therapist_id | clinic_id | therapist_name    | credentials | specialty_id | language_id |
+--------------+-----------+-------------------+-------------+--------------+-------------+
|            1 |         1 | Kalia Prince      | CCC-SLP     |            1 |           1 |
|            3 |         1 | Christian Hickman | CCC-SLP     |            1 |           1 |
|            4 |         1 | Claudia Alvarado  | CCC-SLP     |            1 |           1 |
|            5 |         1 | Abraham Bentley   | CCC-SLP     |            1 |           1 |
|            6 |         1 | Rajah Monroe      | CCC-SLP     |            3 |           1 |
|           12 |         2 | Nell Carey        | CCC-SLP     |            3 |           1 |
|           14 |         2 | Armando Key       | CCC-SLP     |            3 |           1 |
|           16 |         2 | Kaseem Sexton     | CCC-SLP     |            3 |           2 |
|           17 |         2 | Megan Vinson      | CCC-SLP     |            8 |           2 |
|           22 |         3 | Ariana Brewer     | CCC-SLP     |            7 |           2 |
|           24 |         3 | Basia Wong        | CCC-SLP     |           10 |           2 |
|           26 |         3 | Virginia Gray     | CCC-SLP     |            8 |           2 |
|           33 |         4 | Baker Phelps      | CCC-SLP     |            2 |           2 |
|           35 |         5 | Cade Duncan       | CCC-SLP     |            1 |           1 |
+--------------+-----------+-------------------+-------------+--------------+-------------+
14 rows in set (0.00 sec)
```



```
mysql> SELECT * FROM billing_status;
+-----------+-----------+
| status_id | status    |
+-----------+-----------+
|         2 | COMPLETED |
|         1 | PENDING   |
|         3 | REFUNDED  |
+-----------+-----------+
3 rows in set (0.00 sec)
```

Max Count of Records



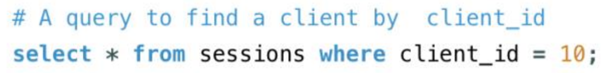
```
mysql> select count(*) from sessions;
+----------+
| count(*) |
+----------+
|     7180 |
+----------+
1 row in set (0.03 sec)

mysql> select count(*) from billing_records;
+----------+
| count(*) |
+----------+
|     7180 |
+----------+
1 row in set (0.02 sec)

mysql> 
```

Data Queries

Queries against my data will model common operations performed at a speech therapist clinic. This includes the following operations:

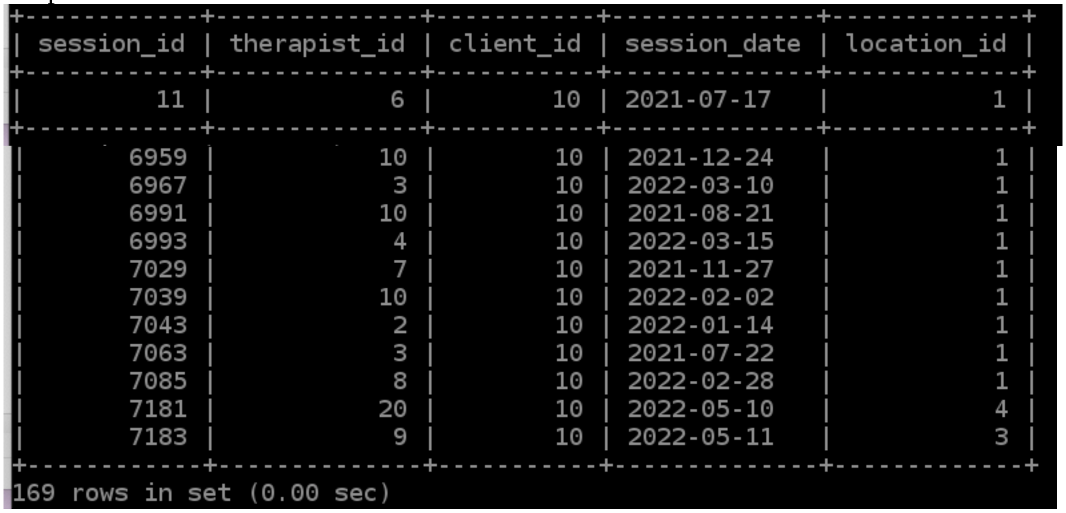
Query 1 – Searching for a client's sessions.

This query shows the amount of session a client has received.



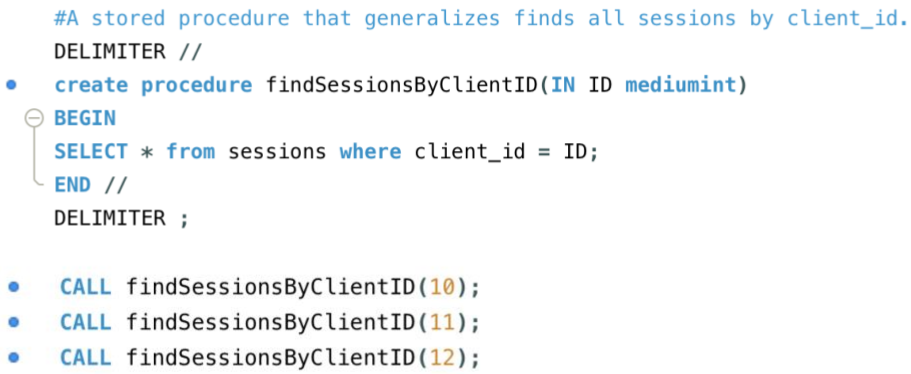
```
# A query to find a client by  client_id
select * from sessions where client_id = 10;
```

Output



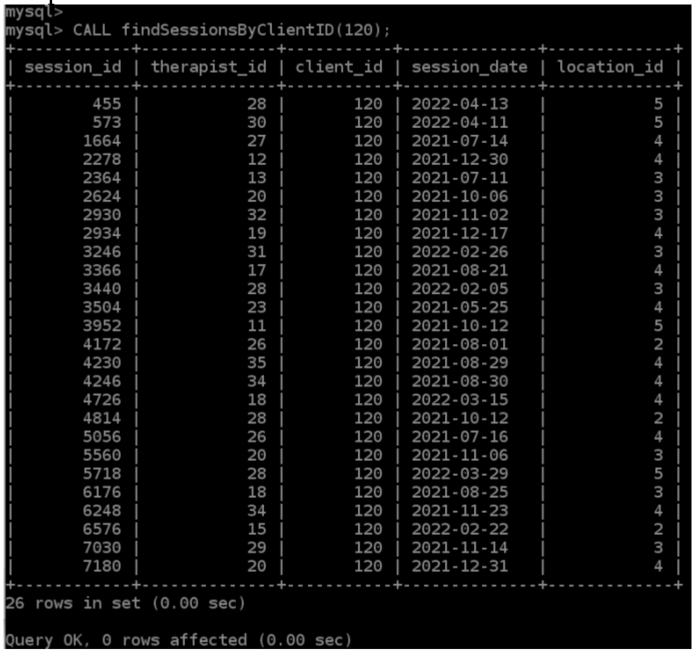
```
+------------+--------------+-----------+--------------+-------------+
| session_id | therapist_id | client_id | session_date | location_id |
+------------+--------------+-----------+--------------+-------------+
|         11 |            6 |        10 | 2021-07-17   |           1 |
+------------+--------------+-----------+--------------+-------------+
|       6959 |           10 |        10 | 2021-12-24   |           1 |
|       6967 |            3 |        10 | 2022-03-10   |           1 |
|       6991 |           10 |        10 | 2021-08-21   |           1 |
|       6993 |            4 |        10 | 2022-03-15   |           1 |
|       7029 |            7 |        10 | 2021-11-27   |           1 |
|       7039 |           10 |        10 | 2022-02-02   |           1 |
|       7043 |            2 |        10 | 2022-01-14   |           1 |
|       7063 |            3 |        10 | 2021-07-22   |           1 |
|       7085 |            8 |        10 | 2022-02-28   |           1 |
|       7181 |           20 |        10 | 2022-05-10   |           4 |
|       7183 |            9 |        10 | 2022-05-11   |           3 |
+------------+--------------+-----------+--------------+-------------+
169 rows in set (0.00 sec)
```

A stored procedure was then created to reuse this query and generalize it to all clients.



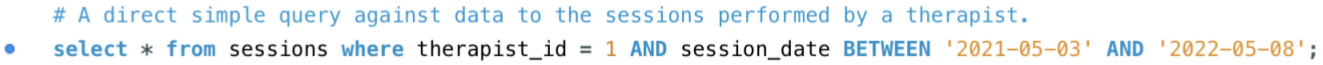
```
#A stored procedure that generalizes finds all sessions by client_id.
DELIMITER //
create procedure findSessionsByClientID(IN ID mediumint)
BEGIN
SELECT * from sessions where client_id = ID;
END //
DELIMITER ;

 CALL findSessionsByClientID(10);
 CALL findSessionsByClientID(11);
 CALL findSessionsByClientID(12);
```

Output



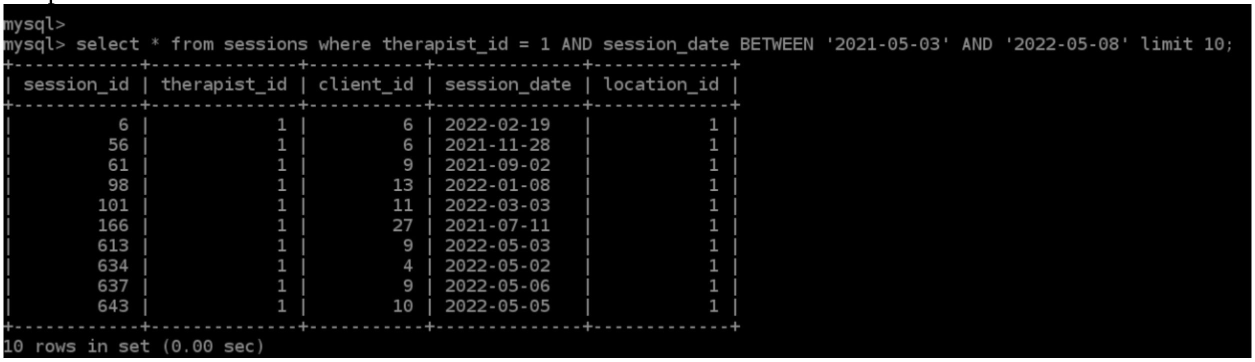
```
mysql>
mysql> CALL findSessionsByClientID(120);
+------------+--------------+-----------+--------------+-------------+
| session_id | therapist_id | client_id | session_date | location_id |
+------------+--------------+-----------+--------------+-------------+
|        455 |           28 |       120 | 2022-04-13   |           5 |
|        573 |           30 |       120 | 2022-04-11   |           5 |
|       1664 |           27 |       120 | 2021-07-14   |           4 |
|       2278 |           12 |       120 | 2021-12-30   |           4 |
|       2364 |           13 |       120 | 2021-07-11   |           3 |
|       2624 |           20 |       120 | 2021-10-06   |           3 |
|       2930 |           32 |       120 | 2021-11-02   |           3 |
|       2934 |           19 |       120 | 2021-12-17   |           4 |
|       3246 |           31 |       120 | 2022-02-26   |           3 |
|       3366 |           17 |       120 | 2021-08-21   |           4 |
|       3440 |           28 |       120 | 2022-02-05   |           3 |
|       3504 |           23 |       120 | 2021-05-25   |           4 |
|       3952 |           11 |       120 | 2021-10-12   |           5 |
|       4172 |           26 |       120 | 2021-08-01   |           2 |
|       4230 |           35 |       120 | 2021-08-29   |           4 |
|       4246 |           34 |       120 | 2021-08-30   |           4 |
|       4726 |           18 |       120 | 2022-03-15   |           4 |
|       4814 |           28 |       120 | 2021-10-12   |           2 |
|       5056 |           26 |       120 | 2021-07-16   |           4 |
|       5560 |           20 |       120 | 2021-11-06   |           3 |
|       5718 |           28 |       120 | 2022-03-29   |           5 |
|       6176 |           18 |       120 | 2021-08-25   |           3 |
|       6248 |           34 |       120 | 2021-11-23   |           4 |
|       6576 |           15 |       120 | 2022-02-22   |           2 |
|       7030 |           29 |       120 | 2021-11-14   |           3 |
|       7180 |           20 |       120 | 2021-12-31   |           4 |
+------------+--------------+-----------+--------------+-------------+
26 rows in set (0.00 sec)

Query OK, 0 rows affected (0.00 sec)
```

Query 2 – Searching for the sessions performed by a therapist over a date range.
This set of queries returns all sessions a therapist performed over a given range. A variation of this query could be used to determine the clinic's payroll.



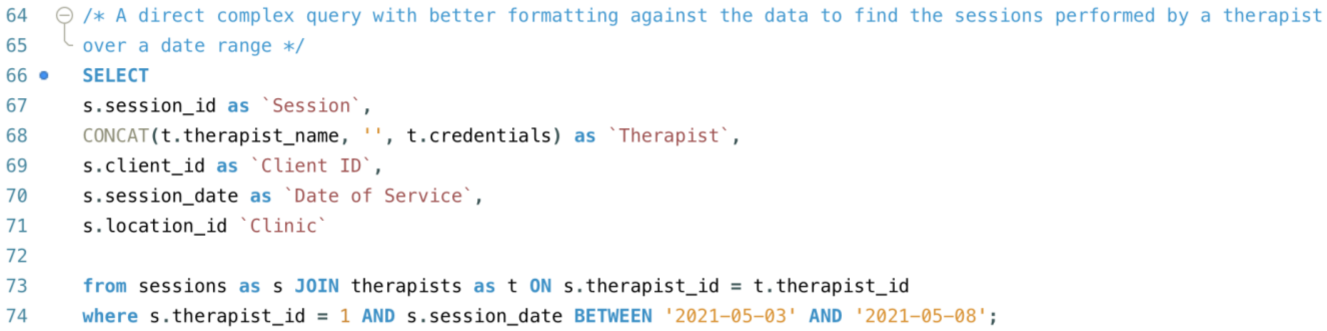
```sql
# A direct simple query against data to the sessions performed by a therapist.
select * from sessions where therapist_id = 1 AND session_date BETWEEN '2021-05-03' AND '2022-05-08';
```

Output



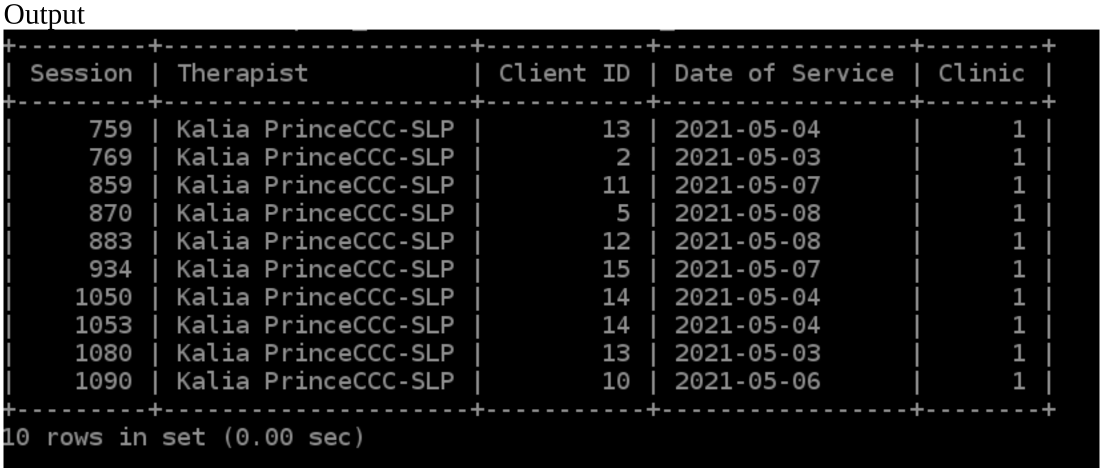
```
mysql>
mysql> select * from sessions where therapist_id = 1 AND session_date BETWEEN '2021-05-03' AND '2022-05-08' limit 10;
+------------+--------------+-----------+--------------+-------------+
| session_id | therapist_id | client_id | session_date | location_id |
+------------+--------------+-----------+--------------+-------------+
|          6 |            1 |         6 | 2022-02-19   |           1 |
|         56 |            1 |         6 | 2021-11-28   |           1 |
|         61 |            1 |         9 | 2021-09-02   |           1 |
|         98 |            1 |        13 | 2022-01-08   |           1 |
|        101 |            1 |        11 | 2022-03-03   |           1 |
|        166 |            1 |        27 | 2021-07-11   |           1 |
|        613 |            1 |         9 | 2022-05-03   |           1 |
|        634 |            1 |         4 | 2022-05-02   |           1 |
|        637 |            1 |         9 | 2022-05-06   |           1 |
|        643 |            1 |        10 | 2022-05-05   |           1 |
+------------+--------------+-----------+--------------+-------------+
10 rows in set (0.00 sec)
```

Reformatting the data for readabiliy.



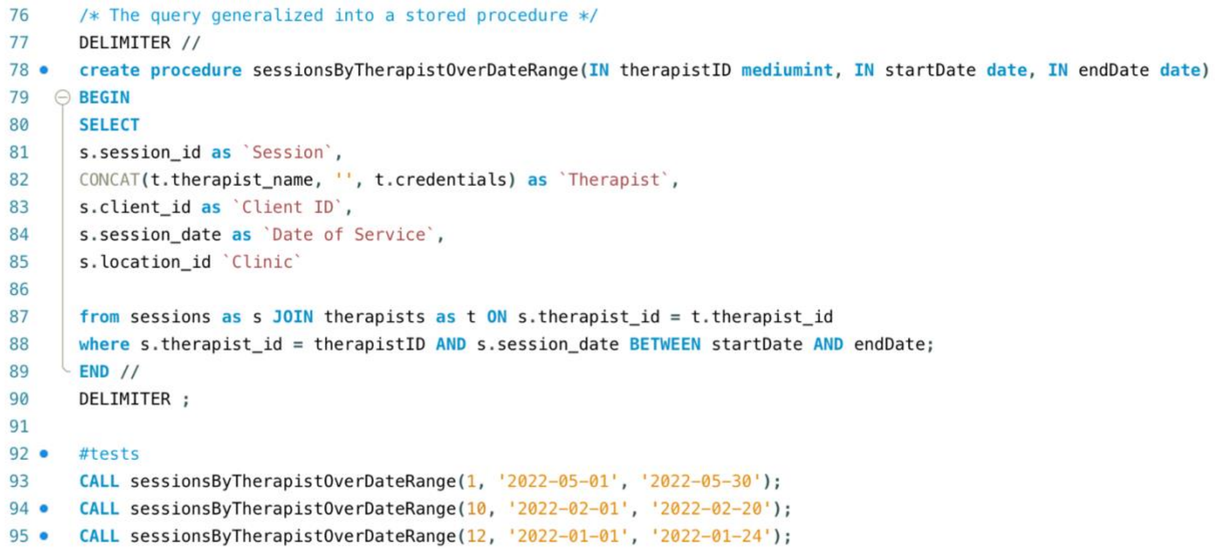
```sql
/* A direct complex query with better formatting against the data to find the sessions performed by a therapist
over a date range */
SELECT
s.session_id as `Session`,
CONCAT(t.therapist_name, '', t.credentials) as `Therapist`,
s.client_id as `Client ID`,
s.session_date as `Date of Service`,
s.location_id `Clinic`

from sessions as s JOIN therapists as t ON s.therapist_id = t.therapist_id
where s.therapist_id = 1 AND s.session_date BETWEEN '2021-05-03' AND '2021-05-08';
```

Output



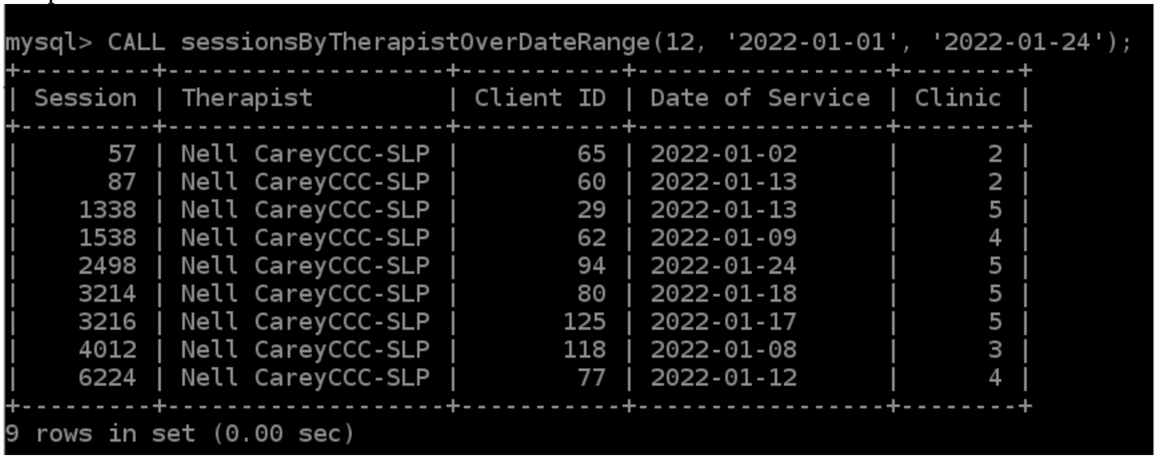
```
+---------+--------------------+-----------+-----------------+--------+
| Session | Therapist          | Client ID | Date of Service | Clinic |
+---------+--------------------+-----------+-----------------+--------+
|     759 | Kalia PrinceCCC-SLP |        13 | 2021-05-04      |      1 |
|     769 | Kalia PrinceCCC-SLP |         2 | 2021-05-03      |      1 |
|     859 | Kalia PrinceCCC-SLP |        11 | 2021-05-07      |      1 |
|     870 | Kalia PrinceCCC-SLP |         5 | 2021-05-08      |      1 |
|     883 | Kalia PrinceCCC-SLP |        12 | 2021-05-08      |      1 |
|     934 | Kalia PrinceCCC-SLP |        15 | 2021-05-07      |      1 |
|    1050 | Kalia PrinceCCC-SLP |        14 | 2021-05-04      |      1 |
|    1053 | Kalia PrinceCCC-SLP |        14 | 2021-05-04      |      1 |
|    1080 | Kalia PrinceCCC-SLP |        13 | 2021-05-03      |      1 |
|    1090 | Kalia PrinceCCC-SLP |        10 | 2021-05-06      |      1 |
+---------+--------------------+-----------+-----------------+--------+
10 rows in set (0.00 sec)
```

Generalizing the query for reuse.



```sql
/* The query generalized into a stored procedure */
DELIMITER //
create procedure sessionsByTherapistOverDateRange(IN therapistID mediumint, IN startDate date, IN endDate date)
BEGIN
SELECT
s.session_id as `Session`,
CONCAT(t.therapist_name, '', t.credentials) as `Therapist`,
s.client_id as `Client ID`,
s.session_date as `Date of Service`,
s.location_id `Clinic`

from sessions as s JOIN therapists as t ON s.therapist_id = t.therapist_id
where s.therapist_id = therapistID AND s.session_date BETWEEN startDate AND endDate;
END //
DELIMITER ;

#tests
CALL sessionsByTherapistOverDateRange(1, '2022-05-01', '2022-05-30');
CALL sessionsByTherapistOverDateRange(10, '2022-02-01', '2022-02-20');
CALL sessionsByTherapistOverDateRange(12, '2022-01-01', '2022-01-24');
```

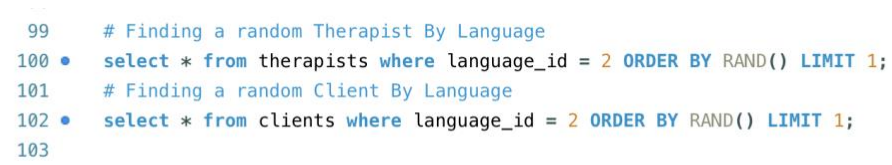
Output



```
mysql> CALL sessionsByTherapistOverDateRange(12, '2022-01-01', '2022-01-24');
+---------+-------------------+-----------+-----------------+--------+
| Session | Therapist         | Client ID | Date of Service | Clinic |
+---------+-------------------+-----------+-----------------+--------+
|      57 | Nell CareyCCC-SLP |        65 | 2022-01-02      |      2 |
|      87 | Nell CareyCCC-SLP |        60 | 2022-01-13      |      2 |
|    1338 | Nell CareyCCC-SLP |        29 | 2022-01-13      |      5 |
|    1538 | Nell CareyCCC-SLP |        62 | 2022-01-09      |      4 |
|    2498 | Nell CareyCCC-SLP |        94 | 2022-01-24      |      5 |
|    3214 | Nell CareyCCC-SLP |        80 | 2022-01-18      |      5 |
|    3216 | Nell CareyCCC-SLP |       125 | 2022-01-17      |      5 |
|    4012 | Nell CareyCCC-SLP |       118 | 2022-01-08      |      3 |
|    6224 | Nell CareyCCC-SLP |        77 | 2022-01-12      |      4 |
+---------+-------------------+-----------+-----------------+--------+
9 rows in set (0.00 sec)
```

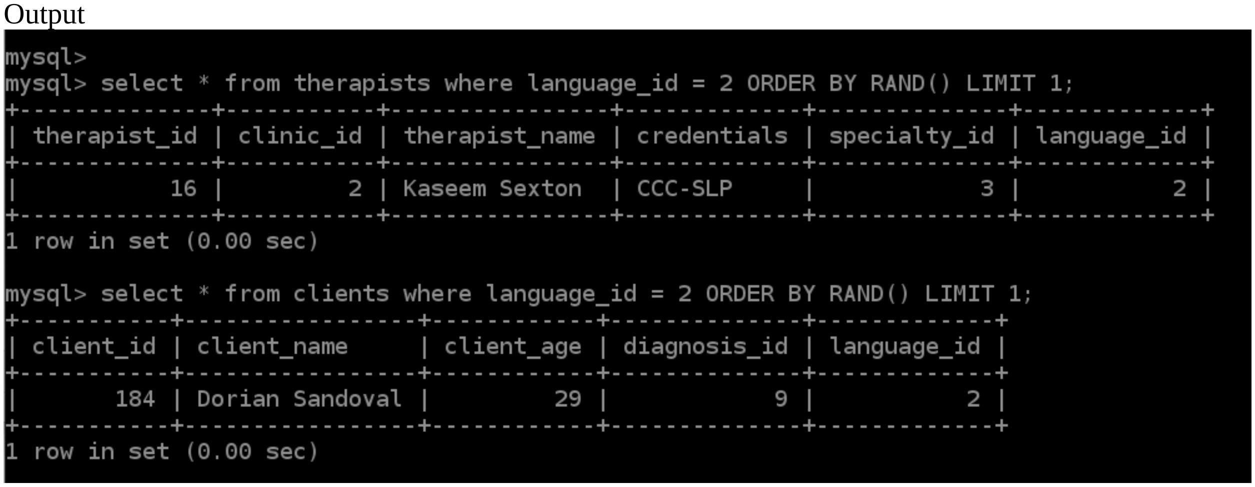
Query 3 – Matching a Therapist and Client by Language

These queries attempt to match a therapist and client by language. This would be useful to the clinic to ensure clients receive work with a therapist that can properly address their needs. A variation of this query could be used to match clients and therapists by diagnosis/specialty.



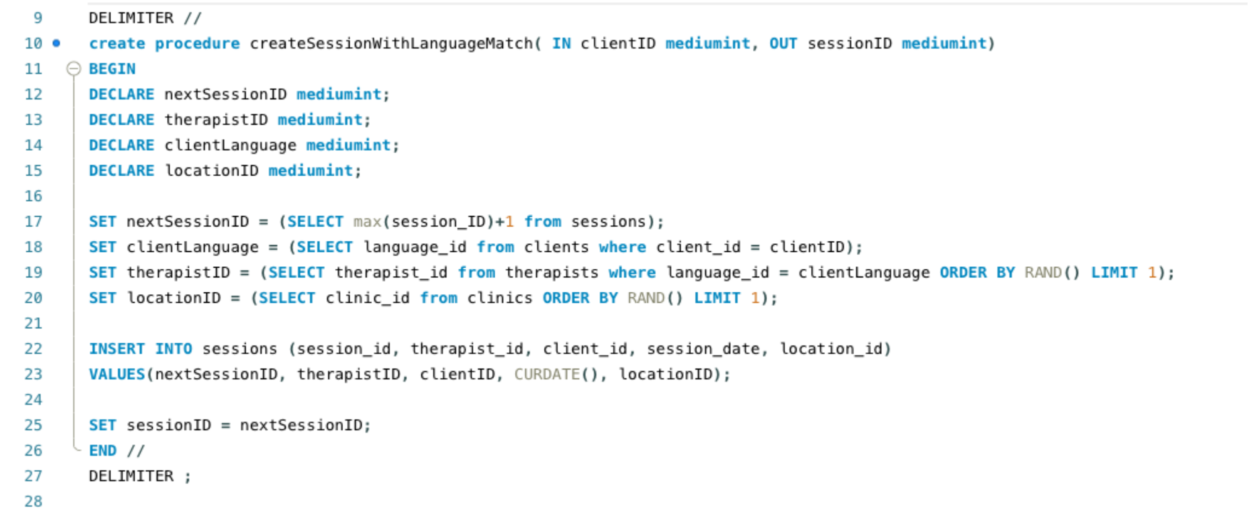
```
# Finding a random Therapist By Language
select * from therapists where language_id = 2 ORDER BY RAND() LIMIT 1;
# Finding a random Client By Language
select * from clients where language_id = 2 ORDER BY RAND() LIMIT 1;

```

Output

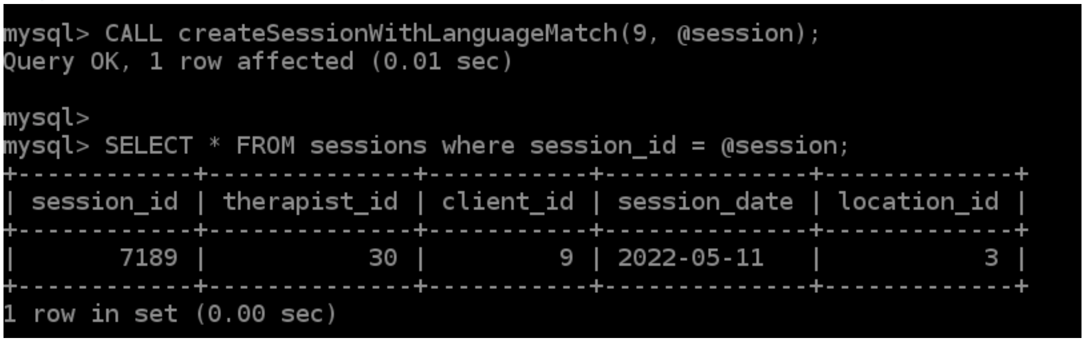


```
mysql>
mysql> select * from therapists where language_id = 2 ORDER BY RAND() LIMIT 1;
+--------------+-----------+----------------+-------------+--------------+-------------+
| therapist_id | clinic_id | therapist_name | credentials | specialty_id | language_id |
+--------------+-----------+----------------+-------------+--------------+-------------+
|           16 |         2 | Kaseem Sexton  | CCC-SLP     |            3 |           2 |
+--------------+-----------+----------------+-------------+--------------+-------------+
1 row in set (0.00 sec)

mysql> select * from clients where language_id = 2 ORDER BY RAND() LIMIT 1;
+-----------+----------------+------------+--------------+-------------+
| client_id | client_name    | client_age | diagnosis_id | language_id |
+-----------+----------------+------------+--------------+-------------+
|       184 | Dorian Sandoval |        29 |            9 |           2 |
+-----------+----------------+------------+--------------+-------------+
1 row in set (0.00 sec)
```

The query generalized into a stored procedure for reuse.

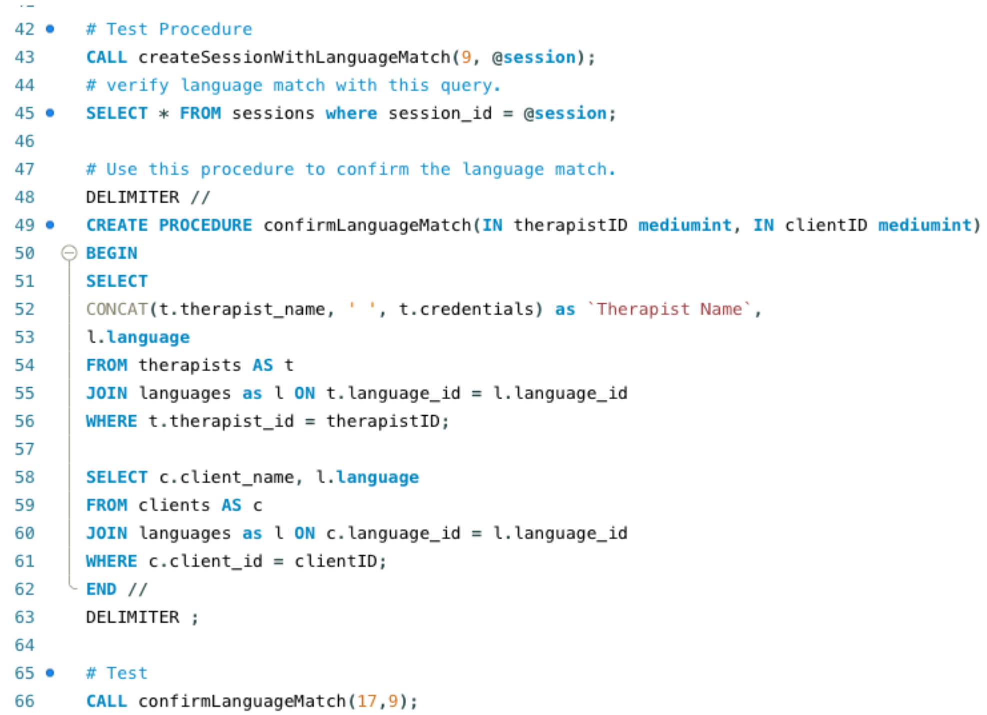


```
DELIMITER //
create procedure createSessionWithLanguageMatch( IN clientID mediumint, OUT sessionID mediumint)
BEGIN
DECLARE nextSessionID mediumint;
DECLARE therapistID mediumint;
DECLARE clientLanguage mediumint;
DECLARE locationID mediumint;

SET nextSessionID = (SELECT max(session_ID)+1 from sessions);
SET clientLanguage = (SELECT language_id from clients where client_id = clientID);
SET therapistID = (SELECT therapist_id from therapists where language_id = clientLanguage ORDER BY RAND() LIMIT 1);
SET locationID = (SELECT clinic_id from clinics ORDER BY RAND() LIMIT 1);

INSERT INTO sessions (session_id, therapist_id, client_id, session_date, location_id)
VALUES(nextSessionID, therapistID, clientID, CURDATE(), locationID);

SET sessionID = nextSessionID;
END //
DELIMITER ;
```



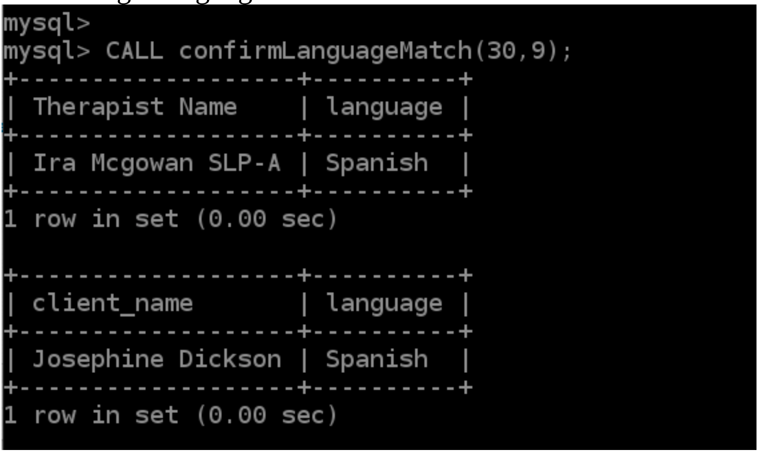
```
mysql> CALL createSessionWithLanguageMatch(9, @session);
Query OK, 1 row affected (0.01 sec)

mysql>
mysql> SELECT * FROM sessions where session_id = @session;
+------------+--------------+-----------+--------------+-------------+
| session_id | therapist_id | client_id | session_date | location_id |
+------------+--------------+-----------+--------------+-------------+
|       7189 |           30 |         9 | 2022-05-11   |           3 |
+------------+--------------+-----------+--------------+-------------+
1 row in set (0.00 sec)
```

To test this procedure another stored procedure was created to confirm the match.



```sql
# Test Procedure
CALL createSessionWithLanguageMatch(9, @session);
# verify language match with this query.
SELECT * FROM sessions where session_id = @session;

# Use this procedure to confirm the language match.
DELIMITER //
CREATE PROCEDURE confirmLanguageMatch(IN therapistID mediumint, IN clientID mediumint)
BEGIN
SELECT
CONCAT(t.therapist_name, ' ', t.credentials) as `Therapist Name`,
l.language
FROM therapists AS t
JOIN languages as l ON t.language_id = l.language_id
WHERE t.therapist_id = therapistID;

SELECT c.client_name, l.language
FROM clients AS c
JOIN languages as l ON c.language_id = l.language_id
WHERE c.client_id = clientID;
END //
DELIMITER ;

# Test
CALL confirmLanguageMatch(17,9);
```

Confirming a language match

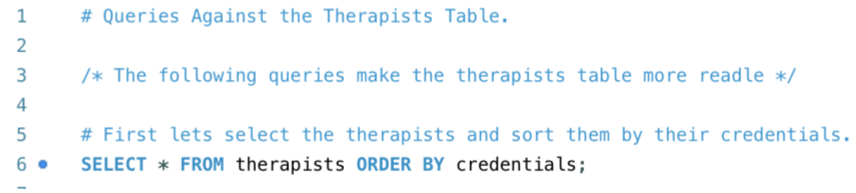


```
mysql>
mysql> CALL confirmLanguageMatch(30,9);
+-------------------+----------+
| Therapist Name    | language |
+-------------------+----------+
| Ira Mcgowan SLP-A | Spanish  |
+-------------------+----------+
1 row in set (0.00 sec)

+-------------------+----------+
| client_name       | language |
+-------------------+----------+
| Josephine Dickson | Spanish  |
+-------------------+----------+
1 row in set (0.00 sec)
```

.

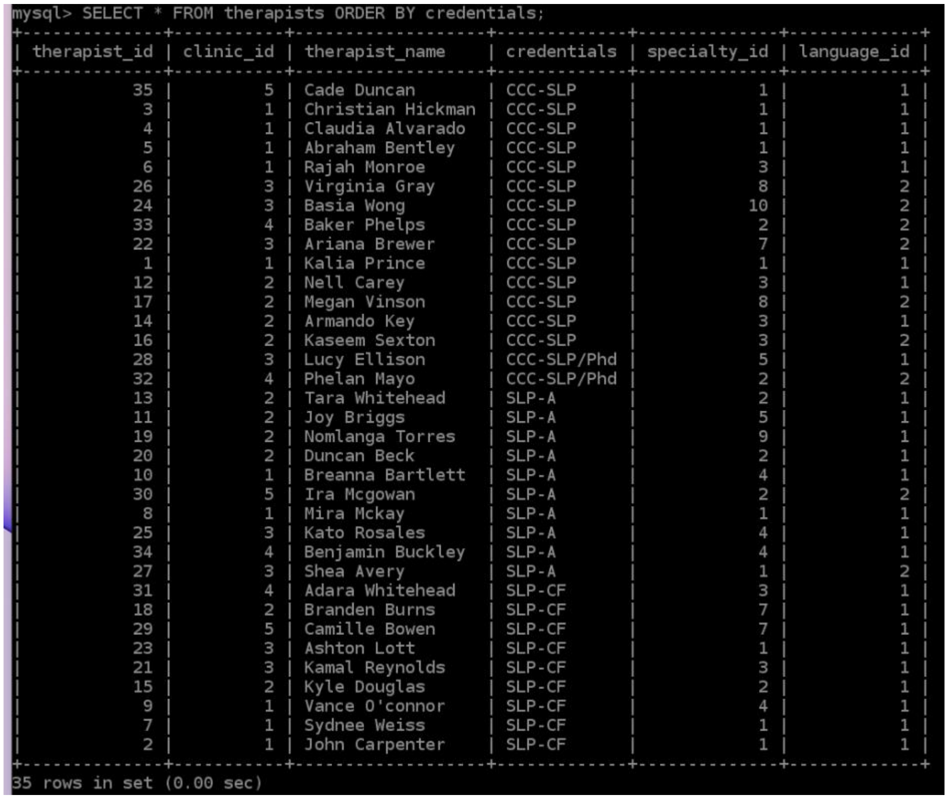
Query 4 – Reformatting Data

This query reformats the therapist table to make the data readable. This could be useful to the clinic to address staffing concerns. From this query the clinic might determine hiring needs address a lack of specialty in their staff.

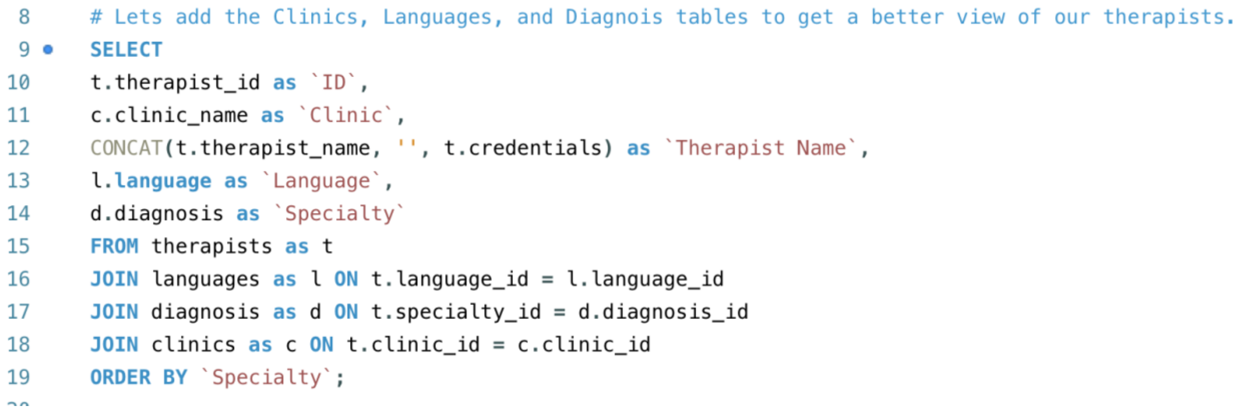


```sql
# Queries Against the Therapists Table.

/* The following queries make the therapists table more readle */

# First lets select the therapists and sort them by their credentials.
SELECT * FROM therapists ORDER BY credentials;
```

We can see from the output that this data could be better formatted for readability.

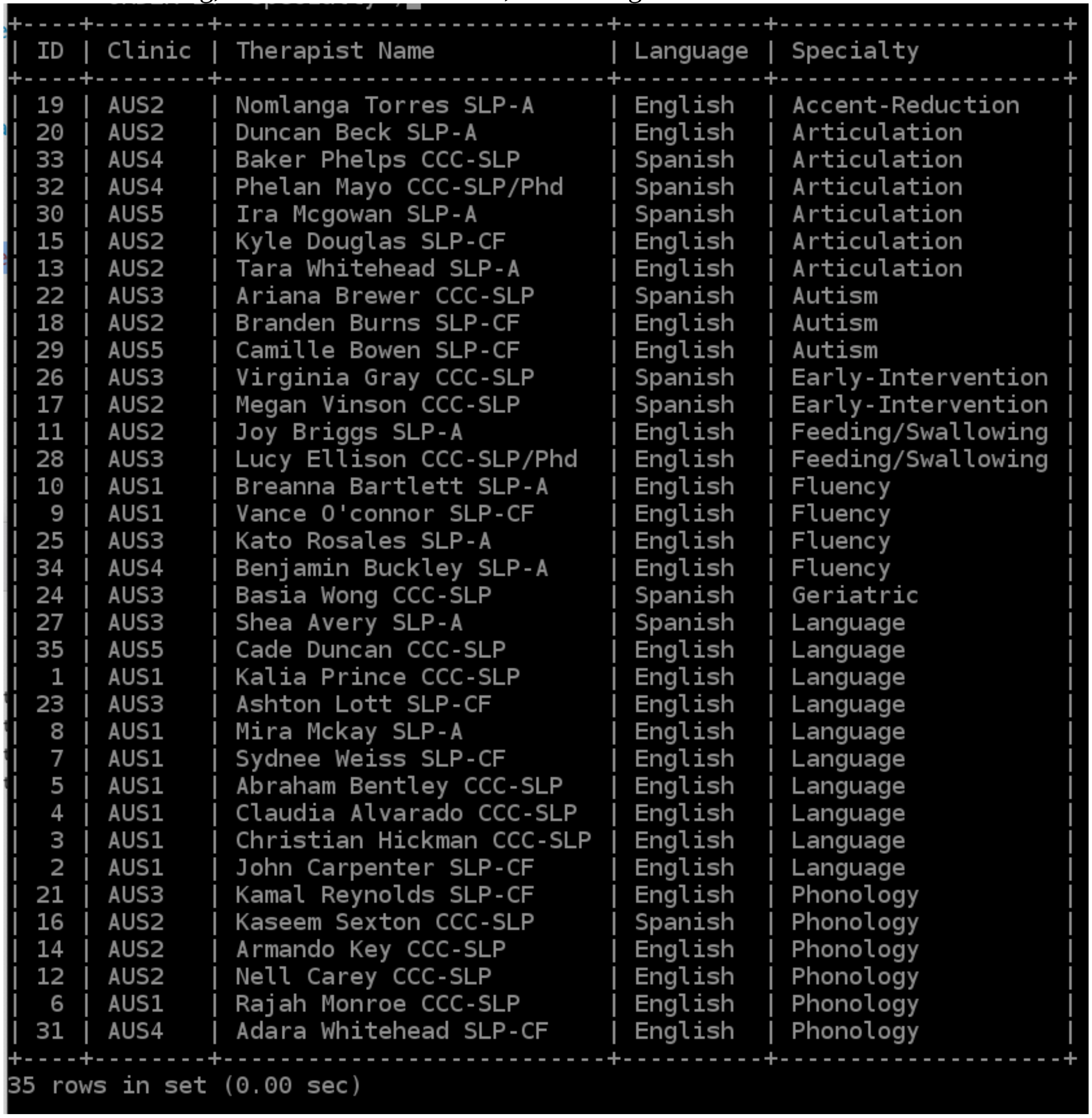


```
mysql> SELECT * FROM therapists ORDER BY credentials;
+--------------+-----------+-------------------+-------------+--------------+-------------+
| therapist_id | clinic_id | therapist_name    | credentials | specialty_id | language_id |
+--------------+-----------+-------------------+-------------+--------------+-------------+
|           35 |         5 | Cade Duncan       | CCC-SLP     |            1 |           1 |
|            3 |         1 | Christian Hickman | CCC-SLP     |            1 |           1 |
|            4 |         1 | Claudia Alvarado  | CCC-SLP     |            1 |           1 |
|            5 |         1 | Abraham Bentley   | CCC-SLP     |            1 |           1 |
|            6 |         1 | Rajah Monroe      | CCC-SLP     |            3 |           1 |
|           26 |         3 | Virginia Gray     | CCC-SLP     |            8 |           2 |
|           24 |         3 | Basia Wong        | CCC-SLP     |           10 |           2 |
|           33 |         4 | Baker Phelps      | CCC-SLP     |            2 |           2 |
|           22 |         3 | Ariana Brewer     | CCC-SLP     |            7 |           2 |
|            1 |         1 | Kalia Prince      | CCC-SLP     |            1 |           1 |
|           12 |         2 | Nell Carey        | CCC-SLP     |            3 |           1 |
|           17 |         2 | Megan Vinson      | CCC-SLP     |            8 |           2 |
|           14 |         2 | Armando Key       | CCC-SLP     |            3 |           1 |
|           16 |         2 | Kaseem Sexton     | CCC-SLP     |            3 |           2 |
|           28 |         3 | Lucy Ellison      | CCC-SLP/Phd |            5 |           1 |
|           32 |         4 | Phelan Mayo       | CCC-SLP/Phd |            2 |           2 |
|           13 |         2 | Tara Whitehead    | SLP-A       |            2 |           1 |
|           11 |         2 | Joy Briggs        | SLP-A       |            5 |           1 |
|           19 |         2 | Nomlanga Torres   | SLP-A       |            9 |           1 |
|           20 |         2 | Duncan Beck       | SLP-A       |            2 |           1 |
|           10 |         1 | Breanna Bartlett  | SLP-A       |            4 |           1 |
|           30 |         5 | Ira Mcgowan       | SLP-A       |            2 |           2 |
|            8 |         1 | Mira Mckay        | SLP-A       |            1 |           1 |
|           25 |         3 | Kato Rosales      | SLP-A       |            4 |           1 |
|           34 |         4 | Benjamin Buckley  | SLP-A       |            4 |           1 |
|           27 |         3 | Shea Avery        | SLP-A       |            1 |           2 |
|           31 |         4 | Adara Whitehead   | SLP-CF      |            3 |           1 |
|           18 |         2 | Branden Burns     | SLP-CF      |            7 |           1 |
|           29 |         5 | Camille Bowen     | SLP-CF      |            7 |           1 |
|           23 |         3 | Ashton Lott       | SLP-CF      |            1 |           1 |
|           21 |         3 | Kamal Reynolds    | SLP-CF      |            3 |           1 |
|           15 |         2 | Kyle Douglas      | SLP-CF      |            2 |           1 |
|            9 |         1 | Vance O'connor    | SLP-CF      |            4 |           1 |
|            7 |         1 | Sydnee Weiss      | SLP-CF      |            1 |           1 |
|            2 |         1 | John Carpenter    | SLP-CF      |            1 |           1 |
+--------------+-----------+-------------------+-------------+--------------+-------------+
35 rows in set (0.00 sec)
```



```sql
# Lets add the Clinics, Languages, and Diagnois tables to get a better view of our therapists.
SELECT
t.therapist_id as `ID`,
c.clinic_name as `Clinic`,
CONCAT(t.therapist_name, '', t.credentials) as `Therapist Name`,
l.language as `Language`,
d.diagnosis as `Specialty`
FROM therapists as t
JOIN languages as l ON t.language_id = l.language_id
JOIN diagnosis as d ON t.specialty_id = d.diagnosis_id
JOIN clinics as c ON t.clinic_id = c.clinic_id
ORDER BY `Specialty`;
```

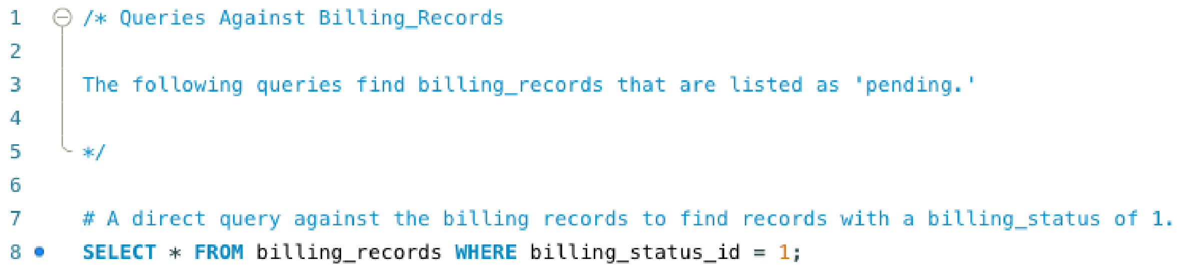
After reformatting, the data is easier to read, and management now has a better view of their therapists.



```
+----+--------+---------------------------+----------+--------------------+
| ID | Clinic | Therapist Name            | Language | Specialty          |
+----+--------+---------------------------+----------+--------------------+
| 19 | AUS2   | Nomlanga Torres SLP-A     | English  | Accent-Reduction   |
| 20 | AUS2   | Duncan Beck SLP-A         | English  | Articulation       |
| 33 | AUS4   | Baker Phelps CCC-SLP      | Spanish  | Articulation       |
| 32 | AUS4   | Phelan Mayo CCC-SLP/Phd   | Spanish  | Articulation       |
| 30 | AUS5   | Ira Mcgowan SLP-A         | Spanish  | Articulation       |
| 15 | AUS2   | Kyle Douglas SLP-CF       | English  | Articulation       |
| 13 | AUS2   | Tara Whitehead SLP-A      | English  | Articulation       |
| 22 | AUS3   | Ariana Brewer CCC-SLP     | Spanish  | Autism             |
| 18 | AUS2   | Branden Burns SLP-CF      | English  | Autism             |
| 29 | AUS5   | Camille Bowen SLP-CF      | English  | Autism             |
| 26 | AUS3   | Virginia Gray CCC-SLP     | Spanish  | Early-Intervention |
| 17 | AUS2   | Megan Vinson CCC-SLP      | Spanish  | Early-Intervention |
| 11 | AUS2   | Joy Briggs SLP-A          | English  | Feeding/Swallowing |
| 28 | AUS3   | Lucy Ellison CCC-SLP/Phd  | English  | Feeding/Swallowing |
| 10 | AUS1   | Breanna Bartlett SLP-A    | English  | Fluency            |
|  9 | AUS1   | Vance O'connor SLP-CF     | English  | Fluency            |
| 25 | AUS3   | Kato Rosales SLP-A        | English  | Fluency            |
| 34 | AUS4   | Benjamin Buckley SLP-A    | English  | Fluency            |
| 24 | AUS3   | Basia Wong CCC-SLP        | Spanish  | Geriatric          |
| 27 | AUS3   | Shea Avery SLP-A          | Spanish  | Language           |
| 35 | AUS5   | Cade Duncan CCC-SLP       | English  | Language           |
|  1 | AUS1   | Kalia Prince CCC-SLP      | English  | Language           |
| 23 | AUS3   | Ashton Lott SLP-CF        | English  | Language           |
|  8 | AUS1   | Mira Mckay SLP-A          | English  | Language           |
|  7 | AUS1   | Sydnee Weiss SLP-CF       | English  | Language           |
|  5 | AUS1   | Abraham Bentley CCC-SLP   | English  | Language           |
|  4 | AUS1   | Claudia Alvarado CCC-SLP  | English  | Language           |
|  3 | AUS1   | Christian Hickman CCC-SLP | English  | Language           |
|  2 | AUS1   | John Carpenter SLP-CF     | English  | Language           |
| 21 | AUS3   | Kamal Reynolds SLP-CF     | English  | Phonology          |
| 16 | AUS2   | Kaseem Sexton CCC-SLP     | Spanish  | Phonology          |
| 14 | AUS2   | Armando Key CCC-SLP       | English  | Phonology          |
| 12 | AUS2   | Nell Carey CCC-SLP        | English  | Phonology          |
|  6 | AUS1   | Rajah Monroe CCC-SLP      | English  | Phonology          |
| 31 | AUS4   | Adara Whitehead SLP-CF    | English  | Phonology          |
+----+--------+---------------------------+----------+--------------------+
35 rows in set (0.00 sec)
```

Query 5 – Searching for Pending Records.

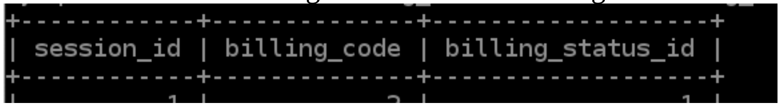
This set of queries searches the billing records table to find sessions with a billing status of “pending.” Such a case is useful to the clinic in order to follow up with pending records and ensure services are reimbursed promptly.



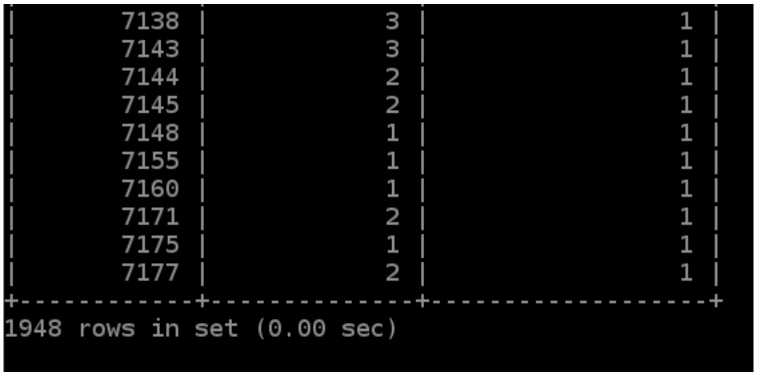
```
/* Queries Against Billing_Records

The following queries find billing_records that are listed as 'pending.'

*/

# A direct query against the billing records to find records with a billing_status of 1.
SELECT * FROM billing_records WHERE billing_status_id = 1;
```

Output

We can see there are a large number of outstanding records

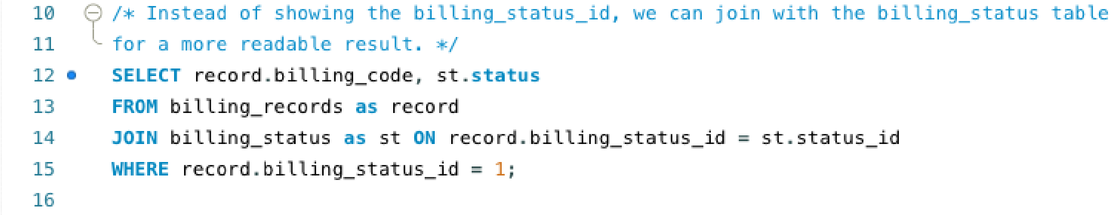


```
+------------+--------------+-------------------+
| session_id | billing_code | billing_status_id |
+------------+--------------+-------------------+
|          1 |            2 |                 1 |
```

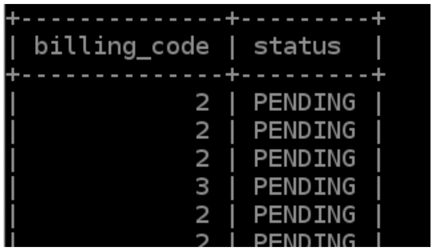


```
|       7138 |            3 |                 1 |
|       7143 |            3 |                 1 |
|       7144 |            2 |                 1 |
|       7145 |            2 |                 1 |
|       7148 |            1 |                 1 |
|       7155 |            1 |                 1 |
|       7160 |            1 |                 1 |
|       7171 |            2 |                 1 |
|       7175 |            1 |                 1 |
|       7177 |            2 |                 1 |
+------------+--------------+-------------------+
1948 rows in set (0.00 sec)
```

Let’s improve readability .

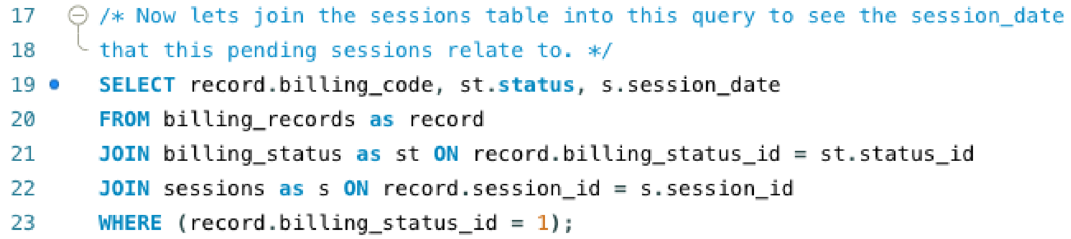


```
/* Instead of showing the billing_status_id, we can join with the billing_status table
for a more readable result. */
SELECT record.billing_code, st.status
FROM billing_records as record
JOIN billing_status as st ON record.billing_status_id = st.status_id
WHERE record.billing_status_id = 1;
```



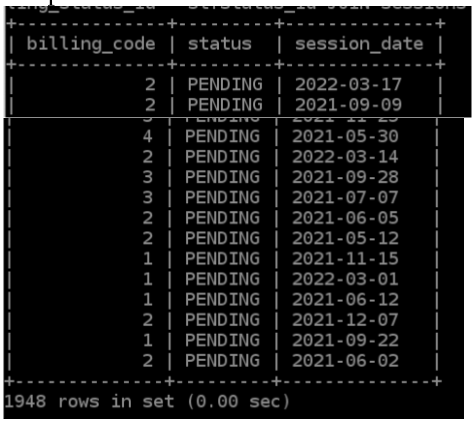
```
+--------------+---------+
| billing_code | status  |
+--------------+---------+
|            2 | PENDING |
|            2 | PENDING |
|            2 | PENDING |
|            3 | PENDING |
|            2 | PENDING |
|            2 | PENDING |
```

We can reformat the query to map the records to their dates.



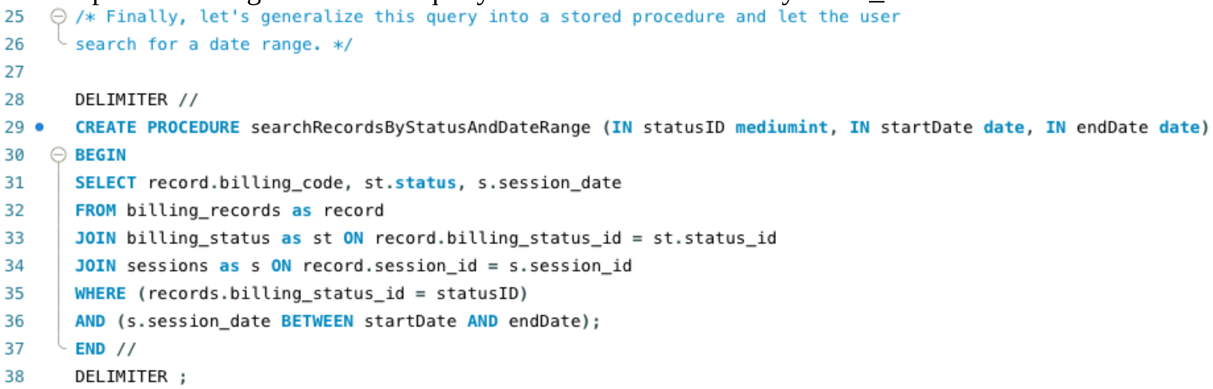
```
/* Now lets join the sessions table into this query to see the session_date
that this pending sessions relate to. */
SELECT record.billing_code, st.status, s.session_date
FROM billing_records as record
JOIN billing_status as st ON record.billing_status_id = st.status_id
JOIN sessions as s ON record.session_id = s.session_id
WHERE (record.billing_status_id = 1);
```

Output

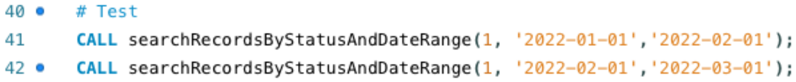


```
+--------------+---------+--------------+
| billing_code | status  | session_date |
+--------------+---------+--------------+
|            2 | PENDING | 2022-03-17   |
|            2 | PENDING | 2021-09-09   |
|            4 | PENDING | 2021-05-30   |
|            2 | PENDING | 2022-03-14   |
|            3 | PENDING | 2021-09-28   |
|            3 | PENDING | 2021-07-07   |
|            2 | PENDING | 2021-06-05   |
|            2 | PENDING | 2021-05-12   |
|            1 | PENDING | 2021-11-15   |
|            1 | PENDING | 2022-03-01   |
|            1 | PENDING | 2021-06-12   |
|            2 | PENDING | 2021-12-07   |
|            1 | PENDING | 2021-09-22   |
|            2 | PENDING | 2021-06-02   |
+--------------+---------+--------------+
1948 rows in set (0.00 sec)
```

A stored procedure to generalize this query and let the user search by status_id.

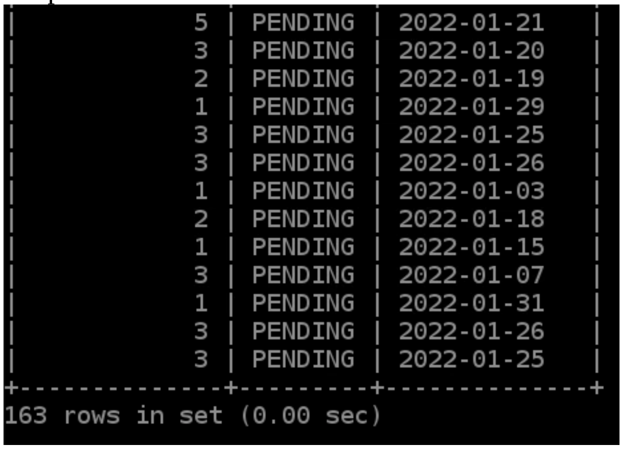


```sql
/* Finally, let's generalize this query into a stored procedure and let the user
search for a date range. */

DELIMITER //
CREATE PROCEDURE searchRecordsByStatusAndDateRange (IN statusID mediumint, IN startDate date, IN endDate date)
BEGIN
SELECT record.billing_code, st.status, s.session_date
FROM billing_records as record
JOIN billing_status as st ON record.billing_status_id = st.status_id
JOIN sessions as s ON record.session_id = s.session_id
WHERE (records.billing_status_id = statusID)
AND (s.session_date BETWEEN startDate AND endDate);
END //
DELIMITER ;
```

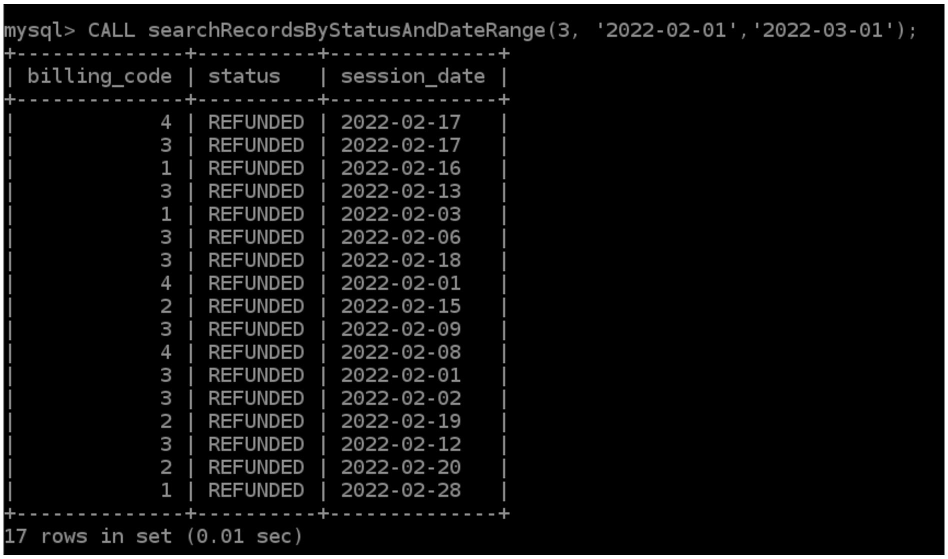


```sql
# Test
CALL searchRecordsByStatusAndDateRange(1, '2022-01-01','2022-02-01');
CALL searchRecordsByStatusAndDateRange(1, '2022-02-01','2022-03-01');
```

Output



```
|             5 | PENDING | 2022-01-21   |
|             3 | PENDING | 2022-01-20   |
|             2 | PENDING | 2022-01-19   |
|             1 | PENDING | 2022-01-29   |
|             3 | PENDING | 2022-01-25   |
|             3 | PENDING | 2022-01-26   |
|             1 | PENDING | 2022-01-03   |
|             2 | PENDING | 2022-01-18   |
|             1 | PENDING | 2022-01-15   |
|             3 | PENDING | 2022-01-07   |
|             1 | PENDING | 2022-01-31   |
|             3 | PENDING | 2022-01-26   |
|             3 | PENDING | 2022-01-25   |
+--------------+---------+-------------+
163 rows in set (0.00 sec)
```



```
mysql> CALL searchRecordsByStatusAndDateRange(3, '2022-02-01','2022-03-01');
+--------------+----------+--------------+
| billing_code | status   | session_date |
+--------------+----------+--------------+
|            4 | REFUNDED | 2022-02-17   |
|            3 | REFUNDED | 2022-02-17   |
|            1 | REFUNDED | 2022-02-16   |
|            3 | REFUNDED | 2022-02-13   |
|            1 | REFUNDED | 2022-02-03   |
|            3 | REFUNDED | 2022-02-06   |
|            3 | REFUNDED | 2022-02-18   |
|            4 | REFUNDED | 2022-02-01   |
|            2 | REFUNDED | 2022-02-15   |
|            3 | REFUNDED | 2022-02-09   |
|            4 | REFUNDED | 2022-02-08   |
|            3 | REFUNDED | 2022-02-01   |
|            3 | REFUNDED | 2022-02-02   |
|            2 | REFUNDED | 2022-02-19   |
|            3 | REFUNDED | 2022-02-12   |
|            2 | REFUNDED | 2022-02-20   |
|            1 | REFUNDED | 2022-02-28   |
+--------------+----------+--------------+
17 rows in set (0.01 sec)
```

Conclusion

Ultimately, this project was a success. The goal of designing, developing, and populating the database matched my expectations – both, challenging and fun. The most challenging part was coming up with a design to meet my expectations but following the resources provided by the course and the previous assignments eased that process. I found data generation to be the most fun part of the assignment and the queries a sharping of the previous work done in the class.

Thank you for reviewing this work and feedback is appreciated.