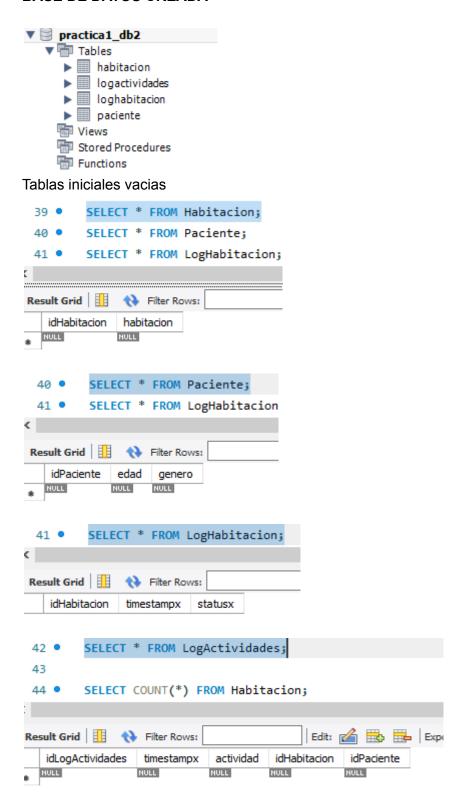
Universidad de San Carlos De Guatemala Facultad de Ingeniería Escuela de Ciencias y Sistemas Base de Datos 2 Ing. Marlon Francisco Orellana Aux. Edin Emanuel Montenegro Vásquez



Integrantes Pareja 15

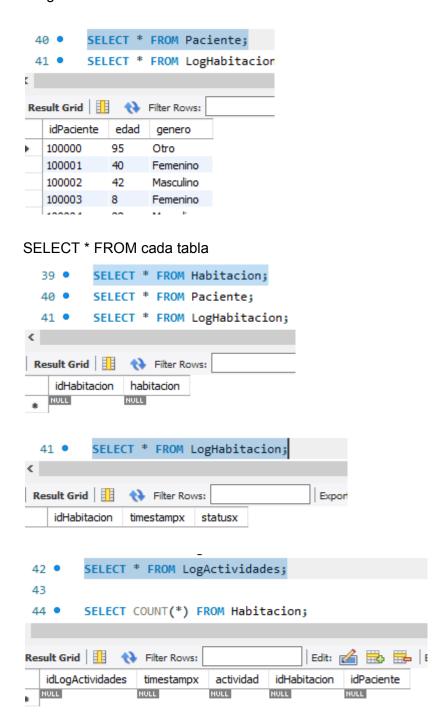
| Nombre | Carnet |
|---------------------------------|-----------|
| Wilson Eduardo Perez Echeverria | 201709110 |
| Sergio Rivelino Pérez Rivera | 201603156 |

BASE DE DATOS CREADA



DIA 1 - CARGAR DATOS DE PACIENTE

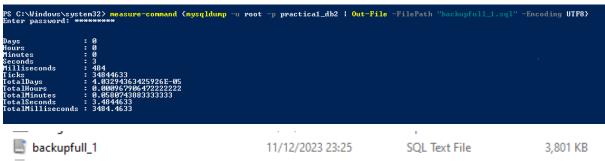
Carga de datos



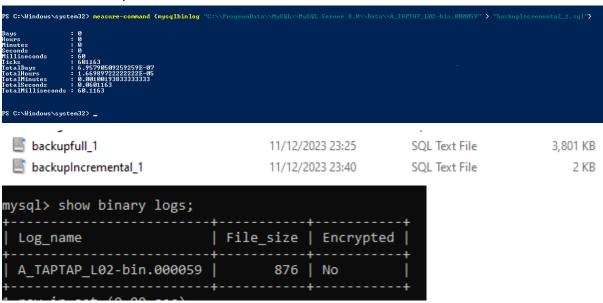
SELECT COUNT(*) FROM cada tabla

```
SELECT (SELECT COUNT(*) FROM Habitacion) as Habitacion,
 44 •
        (SELECT COUNT(*) FROM Paciente) as Paciente,
 45
        (SELECT COUNT(*) FROM LogHabitacion) as LogHabitacion,
 46
        (SELECT COUNT(*) FROM LogActividades) as LogActividades
 47
 48
                                       Export: Wrap Cell Content: 1A
Habitacion Paciente
                    LogHabitacion
                               LogActividades
 0
           154184
```

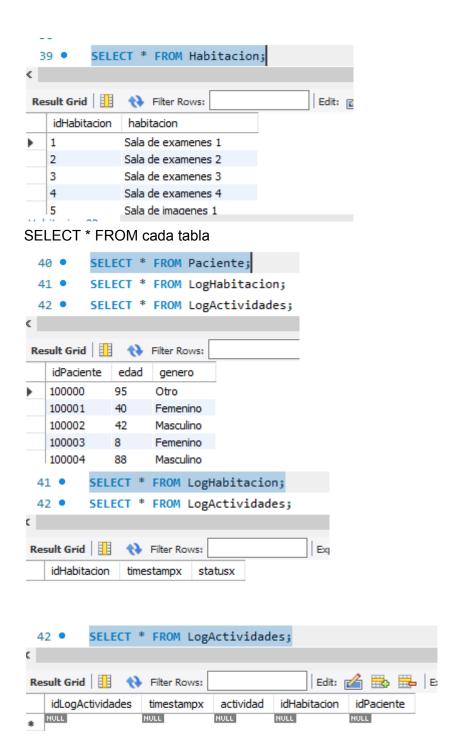
Creación de backup completo



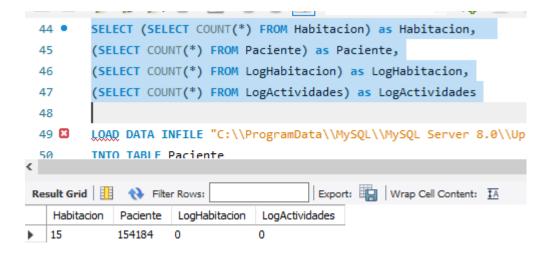
Creación de backup incremental



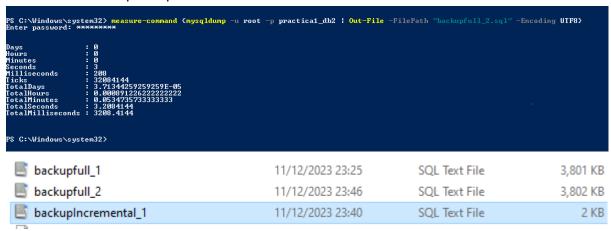
DIA 2 Carga de datos



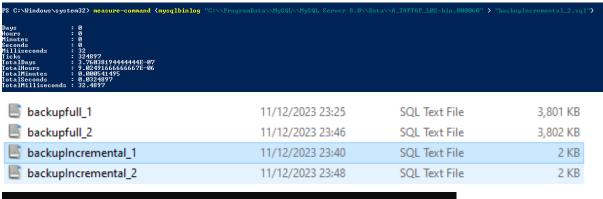
SELECT COUNT(*) FROM cada tabla



Creación de backup completo



Creación de backup incremental



| mysql> show binary logs; | | |
|--|------------|-----------|
| Log_name | File_size | Encrypted |
| A_TAPTAP_L02-bin.000059 A_TAPTAP_L02-bin.000060 | 930 157 | No |

DIA 3 - LogHabitaciones Carga de datos

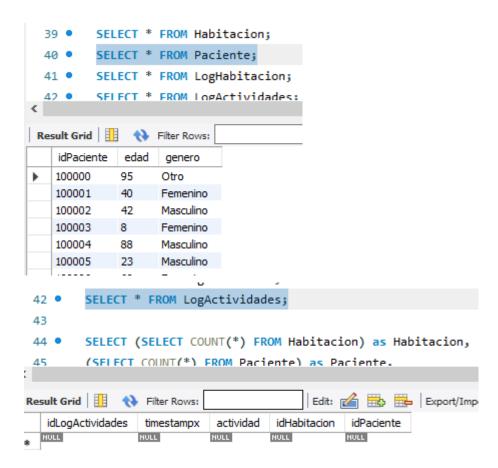
```
LOAD DATA INFILE "C:\\ProgramData\\MySQL\\MySQL Server 8.0\\Uploads\\LogHabitacion.csv"
 INTO TABLE LogHabitacion
 CHARACTER SET 'latin1'
 FIELDS TERMINATED BY ';'
 LINES TERMINATED BY '\n'
 IGNORE 1 ROWS
 (idHabitacion,timestampx,statusx);
         SELECT * FROM LogHabitacion;
 41 •
         SFLECT * FROM LogActividades:
                                            Export: Wrap (
Result Grid
              Filter Rows:
   idHabitacion
               timestampx
                                   statusx
              5/31/2021 7:19:33 AM
                                  Sala no disponible.
  12
              5/31/2021 7:20:00 AM
                                  Inicia limpieza.
  12
              5/31/2021 7:20:35 AM
                                  Sala disponible.
  12
              5/31/2021 7:29:15 AM
                                  Sala no disponible.
  12
              5/31/2021 7:29:42 AM
                                  Inicia limpieza.
  12
              5/31/2021 7:30:31 AM
                                  Sala disponible.
  13
              5/31/2021 7:36:38 AM
                                  Sala no disponible.
SELECT * FROM cada tabla
  39 •
          SELECT * FROM Habitacion;
          SELECT * FROM Paciente;
 40 •
 41 •
          SELECT * FROM LogHabitacion;
  42 •
          SELECT * FROM LogActividades:
Result Grid
               Filter Rows:
    idHabitacion
               habitacion
               Sala de examenes 1
   1
   2
               Sala de examenes 2
   3
               Sala de examenes 3
   4
               Sala de examenes 4
```

5

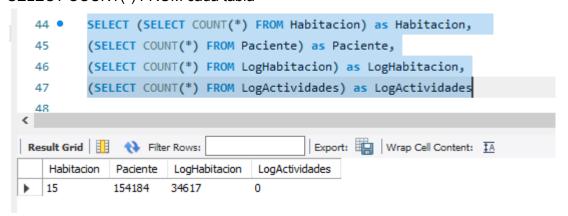
6

Sala de imagenes 1

Sala de procedimientos 1



SELECT COUNT(*) FROM cada tabla



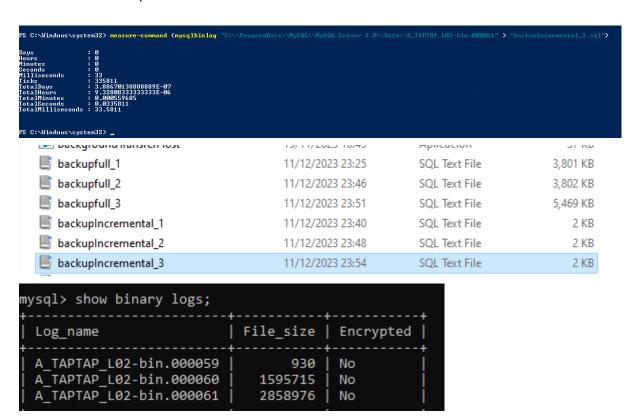
Creación de backup completo

```
PS C:\Windows\system32> measure-command (mysqldump -u root -p practica1_db2 : Out-File -FilePath "backupfull_3.sql" -Encoding UTF8>
Enter password: **************

Days : 0
Hours : 0
Hours : 0
Seconds : 2
Filliseconds : 2
Filli
```

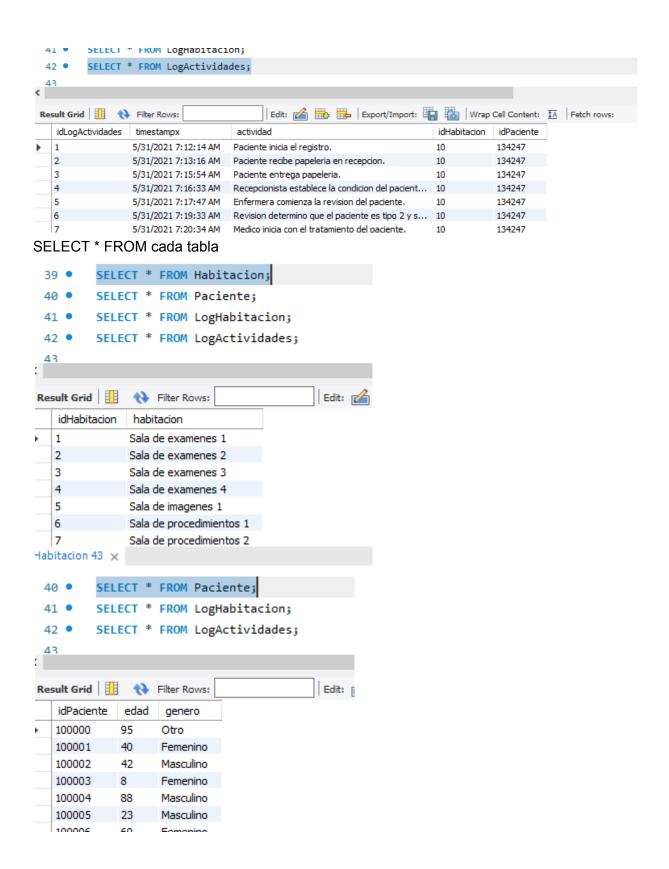
| backupfull_1 | 11/12/2023 23:25 | SQL Text File | 3,801 KB |
|---------------------|------------------|---------------|----------|
| backupfull_2 | 11/12/2023 23:46 | SQL Text File | 3,802 KB |
| backupfull_3 | 11/12/2023 23:51 | SQL Text File | 5,469 KB |
| backupIncremental_1 | 11/12/2023 23:40 | SQL Text File | 2 KB |
| backupIncremental_2 | 11/12/2023 23:48 | SQL Text File | 2 KB |

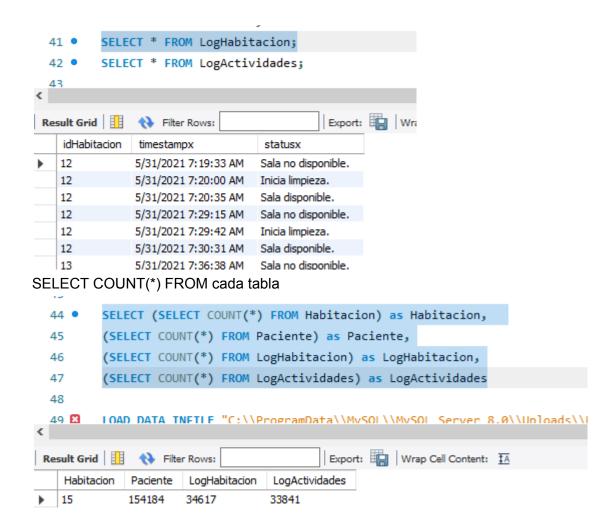
Creación de backup incremental



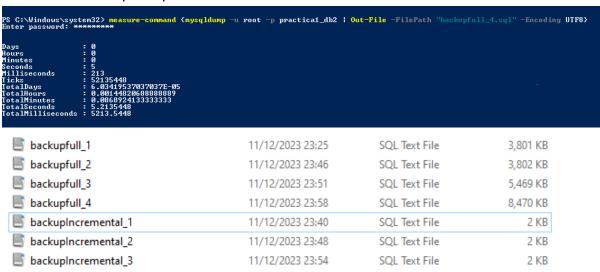
DIA 4

Carga de datos





Creación de backup completo

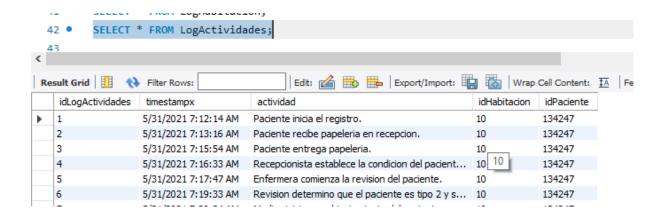


Creación de backup incremental

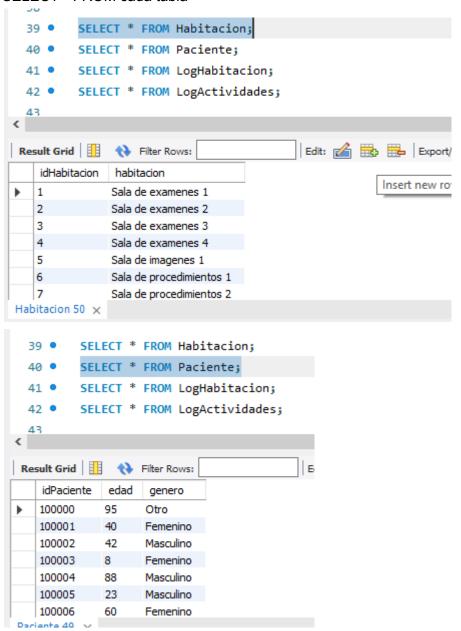
```
888888889E-07
3333333333E-06
___ buckground numbren fost
                                                . 5, . . , 2025 . 01.15
                                                                          присостоп
                                                                                                       .....
backupfull_1
                                                                          SQL Text File
                                                                                                    3,801 KB
                                                11/12/2023 23:25
backupfull_2
                                                11/12/2023 23:46
                                                                          SQL Text File
                                                                                                    3,802 KB
backupfull_3
                                                11/12/2023 23:51
                                                                          SQL Text File
                                                                                                    5,469 KB
backupfull_4
                                                11/12/2023 23:58
                                                                          SQL Text File
                                                                                                    8,470 KB
backuplncremental_1
                                                11/12/2023 23:40
                                                                          SQL Text File
                                                                                                        2 KB
backuplncremental_2
                                                                                                        2 KB
                                                11/12/2023 23:48
                                                                          SQL Text File
backuplncremental_3
                                                11/12/2023 23:54
                                                                          SQL Text File
                                                                                                        2 KB
                                                12/12/2023 00:01
backuplncremental_4
                                                                          SQL Text File
                                                                                                        2 KB
```

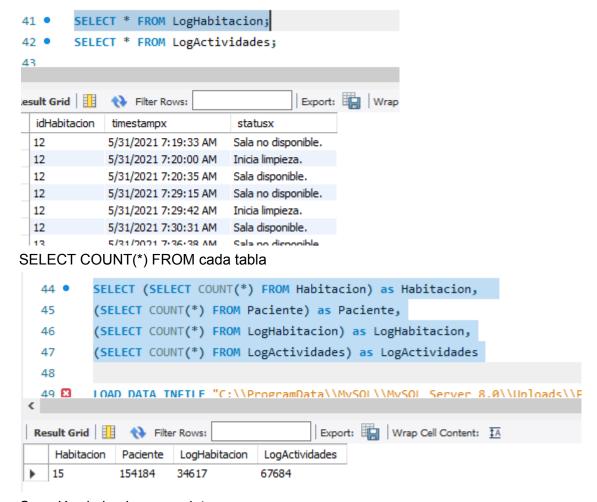
DIA 5:

Carga de datos

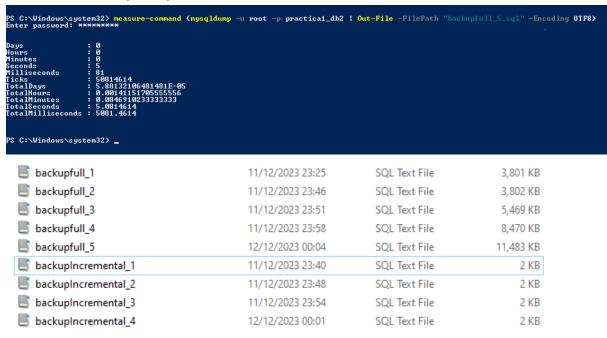


SELECT * FROM cada tabla





Creación de backup completo



Creación de backup incremental

```
mysql> show binary logs;
                          | File_size | Encrypted
 Log_name
 A TAPTAP L02-bin.000059
                                  930
 A_TAPTAP_L02-bin.000060
                              1595715
                                        No
 A_TAPTAP_L02-bin.000061
                              2859030
                                        No
 A TAPTAP L02-bin.000062
                              2859628
                                        No
 A TAPTAP L02-bin.000063
5 rows in set (0.00 sec)
```

| S C:\Windows\system32> measure-command (mysqlbinlog) ays : 0 ours : 0 inutes : 0 inute | 'C:\\ProgramData\\MySQL\\MySQL Server 8.6\\ | .Data\\A_TAPTAP_L02-bin.000063" > "ba | skuplnoremental_5.sq |
|--|---|---|----------------------|
| hackupfull 1 | 11/12/2022 22/25 | SOL Text File | 2 001 VP |
| backupfull_1 | 11/12/2023 23:25 | | 3,801 KB |
| ■ backupfull_2 | 11/12/2023 23:46 | SQL Text File | 3,802 KB |
| backupfull_3 | 11/12/2023 23:51 | SQL Text File | 5,469 KB |
| ■ backupfull_4 | 11/12/2023 23:58 | SQL Text File | 8,470 KB |
| ■ backupfull_5 | 12/12/2023 00:04 | SQL Text File | 11,483 KB |
| backupIncremental_1 | 11/12/2023 23:40 | SQL Text File | 2 KB |
| ■ backupIncremental_2 | 11/12/2023 23:48 | SQL Text File | 2 KB |
| ■ backupIncremental_3 | 11/12/2023 23:54 | SQL Text File | 2 KB |
| ■ backupIncremental_4 | 12/12/2023 00:01 | SQL Text File | 2 KB |
| ■ backupIncremental_5 | 12/12/2023 00:06 | SQL Text File | 2 KB |
| BamSettingsClient.dll | 7/12/2019 03:08 | Extensión de la ap | 16 KB |
| | | | |

Restauración de Full backup

Día 6:

Eliminación de datos

Restauración de full backup 1

SELECT * FROM cada tabla

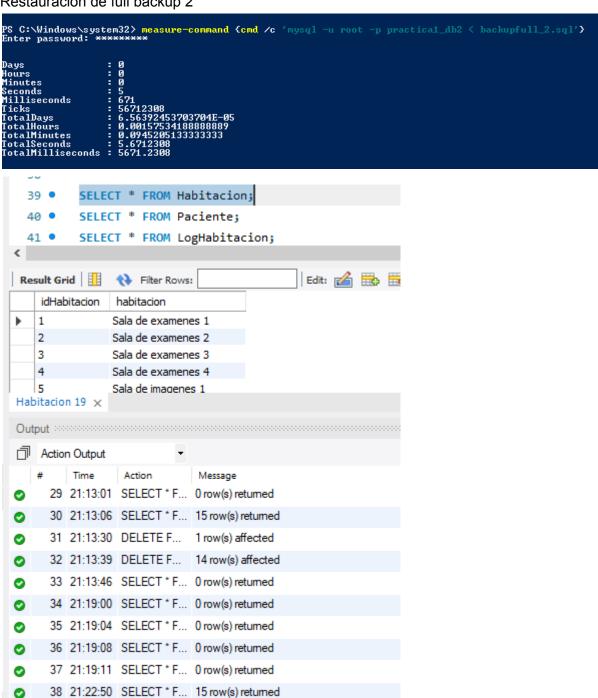
SELECT COUNT(*) FROM cada tabla Día

7:

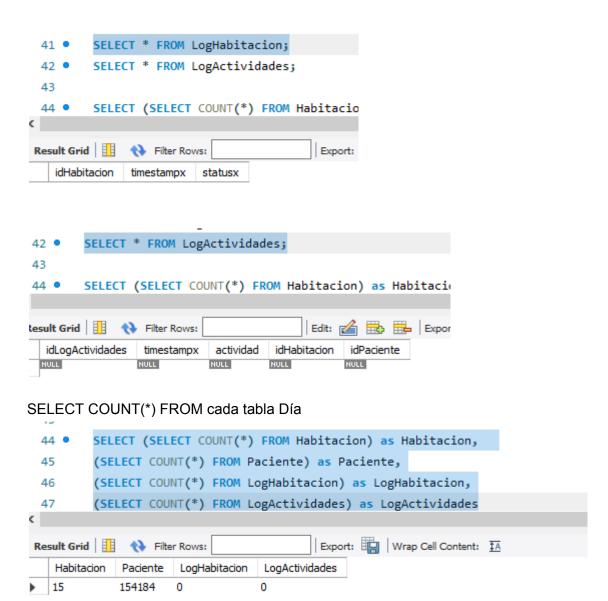
Eliminación de datos

```
#Eliminacion de datos===============
DELETE FROM LogActividades;
DELETE FROM LogHabitacion;
DELETE FROM Paciente WHERE idPaciente = 1;
DELETE FROM Habitacion where idHabitacion > 1;
```

Restauración de full backup 2



SELECT * FROM cada tabla



8: Eliminación de datos

```
#Eliminacion de datos=====
 94
          DELETE FROM LogActividades;
 95 •
          DELETE FROM LogHabitacion;
 96 •
 97 •
          DELETE FROM Paciente WHERE idPaciente > 0;
          DELETE FROM Habitacion where idHabitacion > 0;
 98 •
Output
Action Output
                                                                   Message
         Time
                  Action
     39 21:23:16 SELECT * FROM LogHabitacion LIMIT 0, 1000
                                                                  0 row(s) returned
     40 21:23:32 SELECT * FROM LogActividades LIMIT 0, 1000
                                                                  0 row(s) returned
0
     41 21:24:04 SELECT (SELECT COUNT(*) FROM Habitacion) as Ha... 1 row(s) returned
     42 21:24:57 DELETE FROM LogActividades
                                                                  Error Code: 1175. You are using safe update mode and you tri-
     43 21:25:10 DELETE FROM Paciente WHERE idPaciente > 0
                                                                  154184 row(s) affected
     44 21:25:15 DELETE FROM Habitacion where idHabitacion > 0
                                                                  15 row(s) affected
```

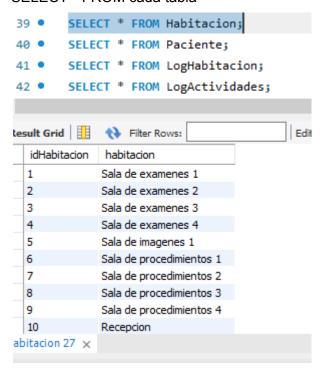
Restauración de full backup 3

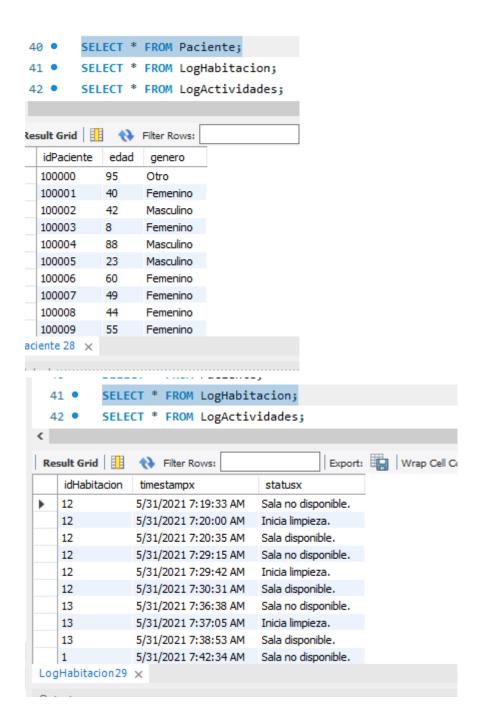
```
PS C:\Windows\system32\ measure-command \( \) c 'mysql -u root -p practical_db2 \( \) backupfull_3.sql' \\
Enter password: **********

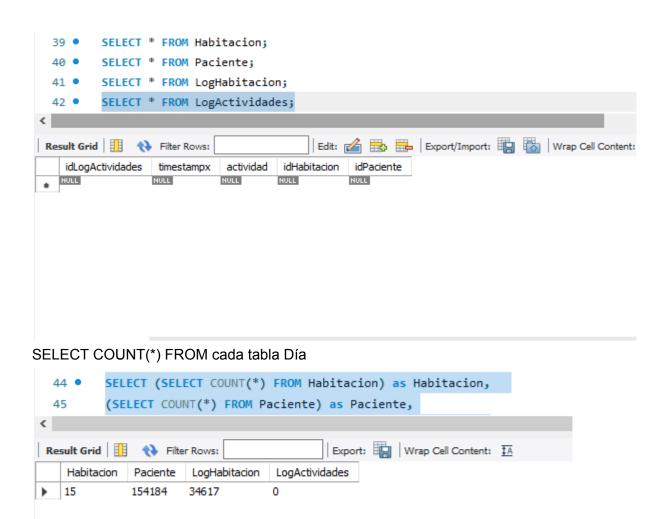
Days : 0
Hours : 0
Minutes : 0
Seconds : 4
Milliseconds : 656
Ticks : 4656 4558
TotalBays : 5.38941643518518E-05
TotalHours : 0.00129345994444444
TotalMinutes : 0.0760759666666667
TotalSeconds : 4.6564558
TotalMilliseconds : 4.656.4558

PS C:\Windows\system32\ _
```

SELECT * FROM cada tabla





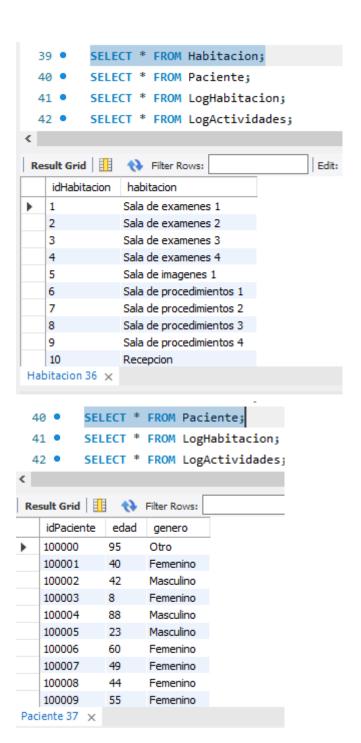


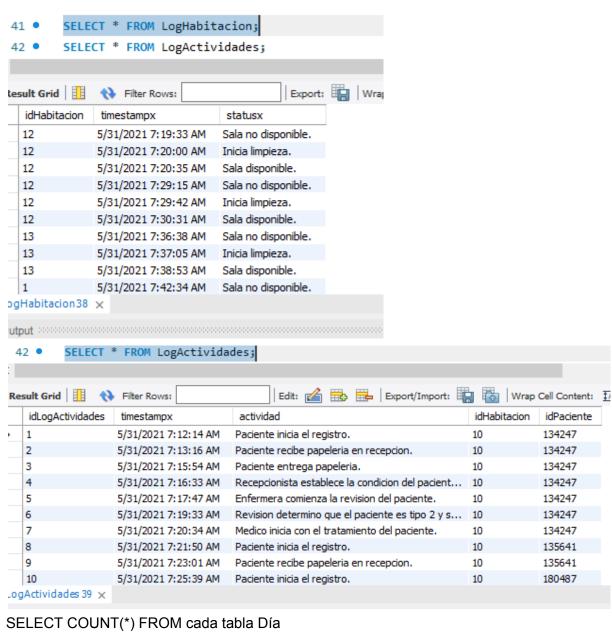
9: Eliminación de datos

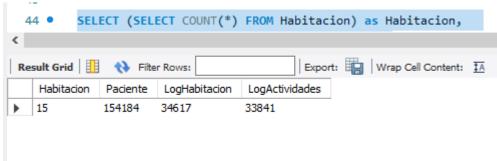
```
94
         #Eliminacion de datos========================
 95 •
         DELETE FROM LogActividades;
         TRUNCATE TABLE LogHabitacion;
 96 •
 97 •
         DELETE FROM Paciente WHERE idPaciente > 0;
98 •
         DELETE FROM Habitacion where idHabitacion > 0;
99
100
101
102
Action Output
       Time
                Action
                                                               Message
    53 21:28:09 SELECT (SELECT COUNT(*) FROM Habitacion) as Ha... 1 row(s) returned
  54 21:28:44 DELETE FROM LogActividades
                                                               Error Code: 1175. You are using
    55 21:28:50 DELETE FROM LogHabitacion
                                                               Error Code: 1175. You are using
    56 21:29:10 TRUNCATE TABLE LogHabitacion
                                                               0 row(s) affected
    57 21:29:14 DELETE FROM Paciente WHERE idPaciente > 0
                                                               154184 row(s) affected
    58 21:29:17 DELETE FROM Habitacion where idHabitacion > 0
                                                               15 row(s) affected
```

Restauración de full backup 4

SELECT * FROM cada tabla







10: Eliminación de datos

```
94
          95 •
         TRUNCATE TABLE LogActividades;
  96 •
          TRUNCATE TABLE LogHabitacion;
          DELETE FROM Paciente WHERE idPaciente > 0;
          DELETE FROM Habitacion where idHabitacion > 0;
  98 •
  99
<
Action Output
        Time
                Action
                                                            Message
     66 21:31:09 SELECT * FROM LogActividades LIMIT 0, 1000
                                                           1000 row(s) returned
     67 21:31:29 SELECT (SELECT COUNT(*) FROM Habitacion) as Ha... 1 row(s) returned
     68 21:32:41 TRUNCATE TABLE LogActividades
                                                           0 row(s) affected
     69 21:32:48 TRUNCATE TABLE LogHabitacion
                                                           0 row(s) affected
     70 21:32:51 DELETE FROM Paciente WHERE idPaciente > 0
                                                           154184 row(s) affected
     71 21:32:54 DELETE FROM Habitacion where idHabitacion > 0
                                                           15 row(s) affected
```

Restauración de full backup 5

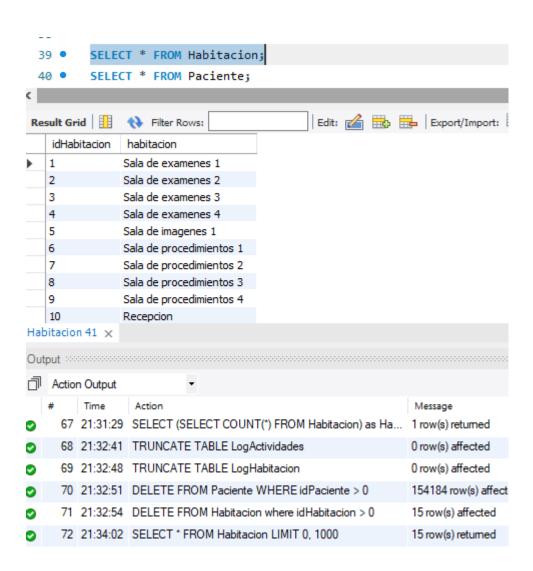
```
PS C:\Windows\system32> measure-command {cmd /c 'mysql -u root -p practica1_db2 < backupfull_5.sql'}

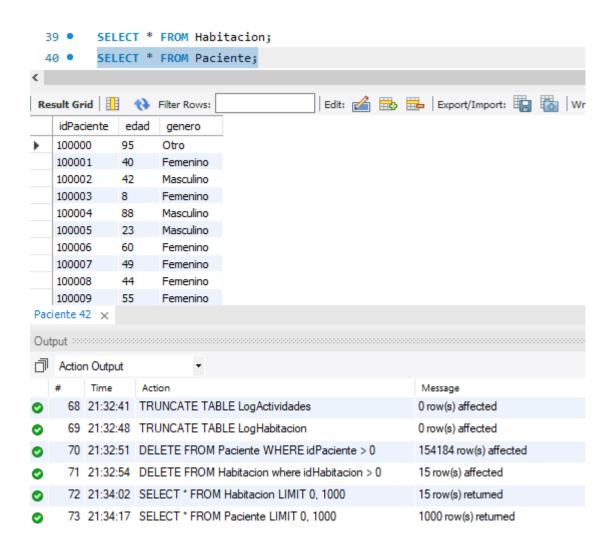
Enter password: *********

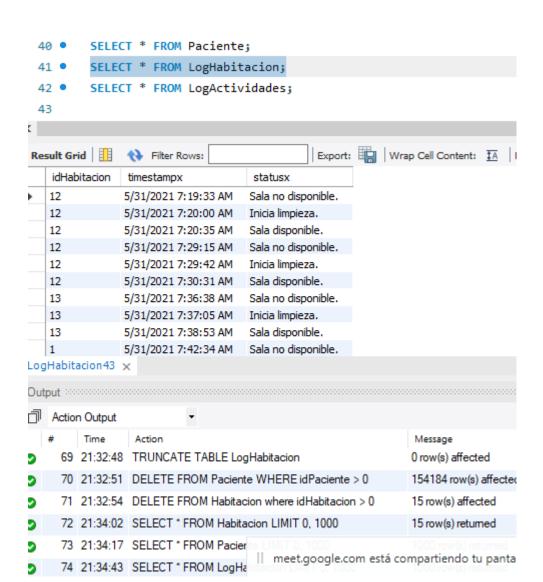
Days : 0
Hours : 0
Minutes : 0
Seconds : 5
Milliseconds : 657
Ticks : 56578814
TotalBays : 6.54847384259259E-05
TotalBours : 0.00157163372222222
TotalMinutes : 0.094290233333333
TotalSeconds : 5.6578814

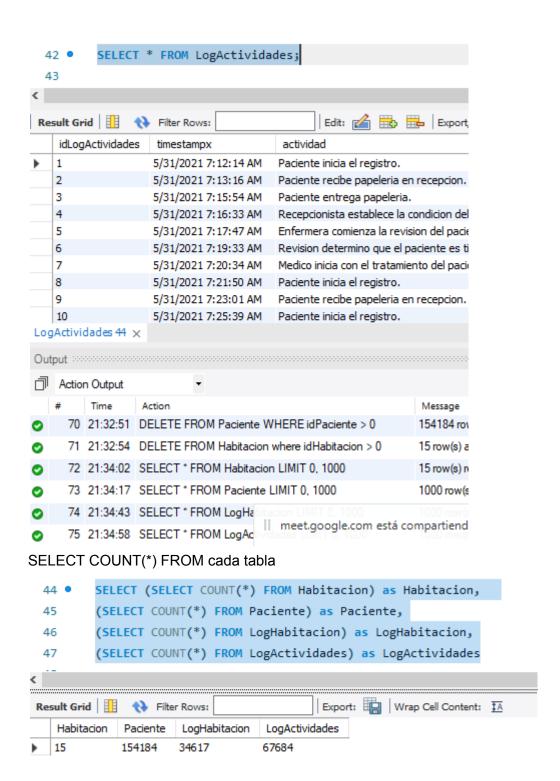
PS C:\Windows\system32> __
```

SELECT * FROM cada tabla





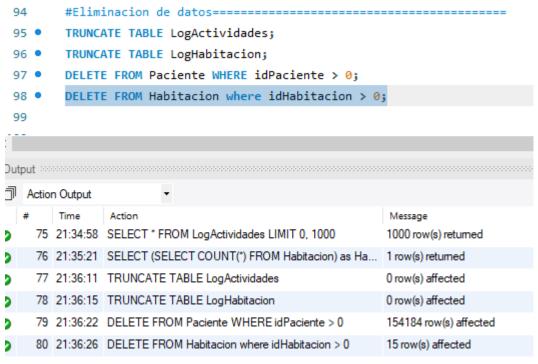




Restauración de Backup incremental

Día 11:

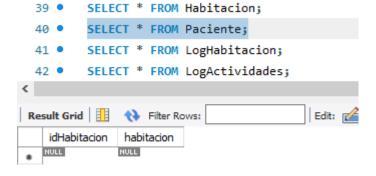
Eliminación de datos

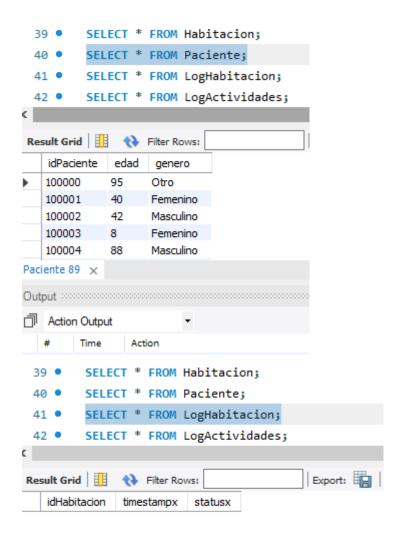


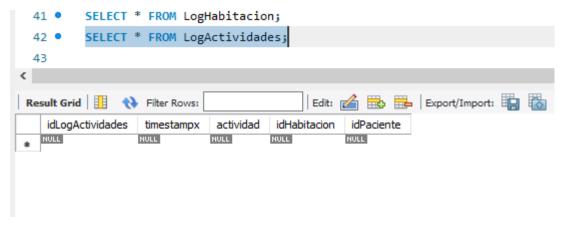
Restauración de backup incremental 1

```
C:\Users\Wilson.Perez>mysql -u root -p practica1_db2 < backupIncremental_1v.sql
Enter password: ********
C:\Users\Wilson.Perez>
```

SELECT * FROM cada tabla







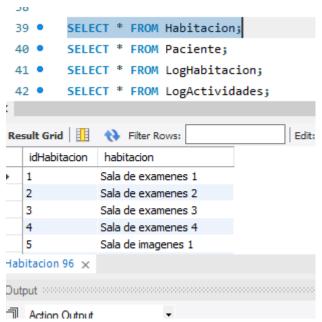
SELECT COUNT(*) FROM cada tabla Día

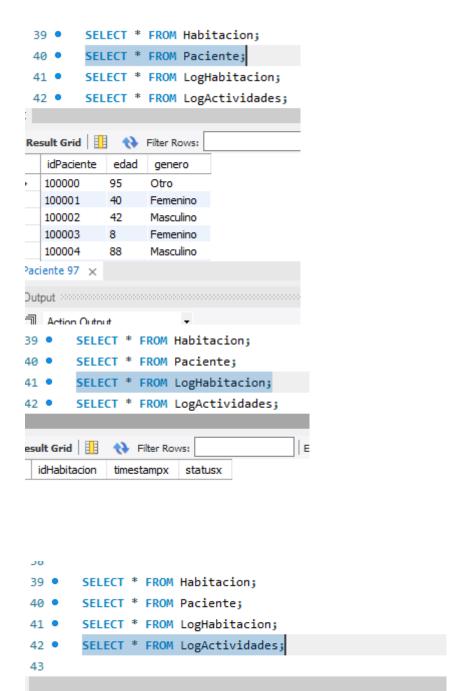


2: Restauración de backup incremental 2

```
C:\Users\Wilson.Perez>mysql -u root -p practica1_db2 < backupIncremental_2v.sql
Enter password: ********
C:\Users\Wilson.Perez>
```

SELECT * FROM cada tabla





actividad

NULL

idHabitacion

NULL

Edit: 🚄 🖶 🖶 Expo

idPaciente

NULL

SELECT COUNT(*) FROM cada tabla Día

timestampx

NULL

Result Grid 🔢 🙌 Filter Rows:

idLogActividades

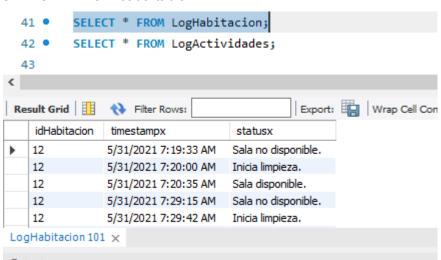
```
SELECT (SELECT COUNT(*) FROM Habitacion) as Habitacion,
 44 •
 45
         (SELECT COUNT(*) FROM Paciente) as Paciente,
         (SELECT COUNT(*) FROM LogHabitacion) as LogHabitacion,
 46
         (SELECT COUNT(*) FROM LogActividades) as LogActividades;
 47
 48
 49 0
         LOAD DATA INFILE "C:\\ProgramData\\MySQL\\MySQL Server 8.0\\Uploa
                                          Export: Wrap Cell Content: IA
Result Grid
             Filter Rows:
   Habitacion
             Paciente
                     LogHabitacion
                                  LogActividades
15
             154184
                     0
                                  0
```

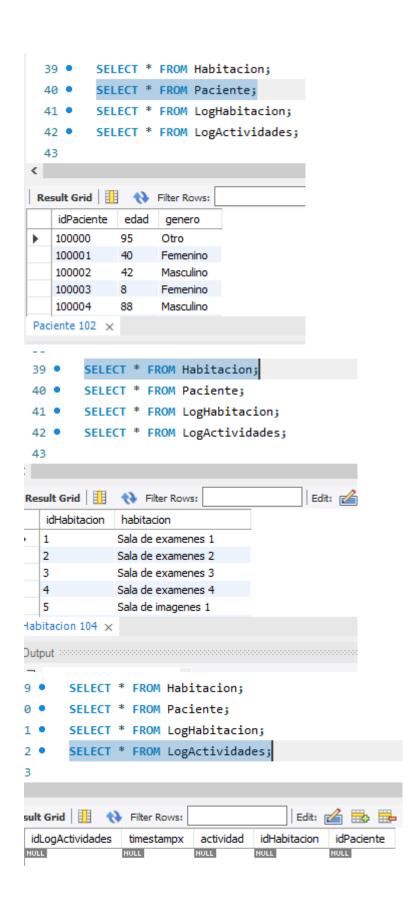
13:

Restauración de backup incremental 3

```
C:\Users\Wilson.Perez>mysql -u root -p practica1_db2 < backupIncremental_3v.sql
Enter password: ********
C:\Users\Wilson.Perez>_
```

SELECT * FROM cada tabla





SELECT COUNT(*) FROM cada tabla Día

```
43
44 •
        SELECT (SELECT COUNT(*) FROM Habitacion) as Habitacion,
        (SELECT COUNT(*) FROM Paciente) as Paciente,
45
        (SELECT COUNT(*) FROM LogHabitacion) as LogHabitacion,
46
        (SELECT COUNT(*) FROM LogActividades) as LogActividades;
47
 48
        LOAD DATA INFILE "C:\\ProgramData\\MySQL\\MySQL Server 8.0\\Up
49 •
                                        Export: Wrap Cell Content: IA
Habitacion
            Paciente
                    LogHabitacion
                                LogActividades
            154184
                    34617
```

14:

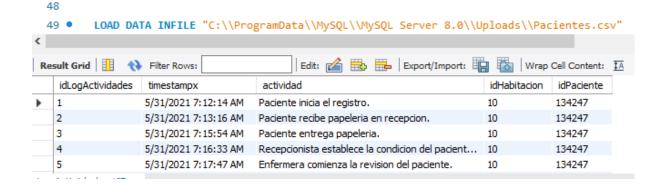
46

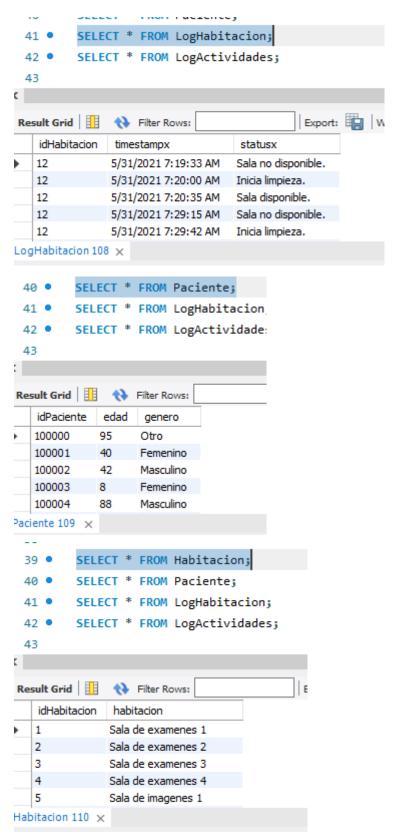
47

Restauración de backup incremental 4

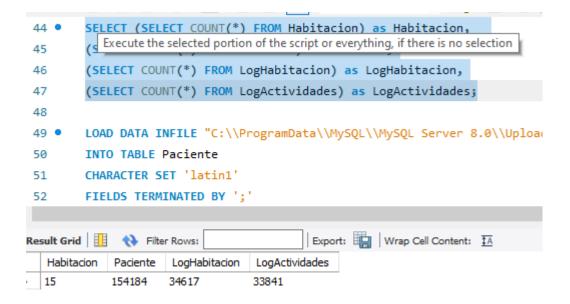
(SELECT COUNT(*) FROM LogHabitacion) as LogHabitacion,

(SELECT COUNT(*) FROM LogActividades) as LogActividades;





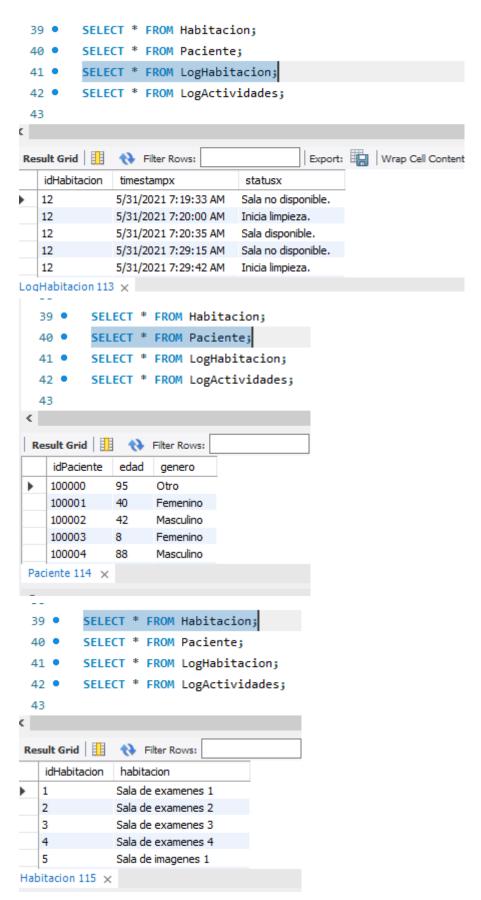
SELECT COUNT(*) FROM cada tabla Día



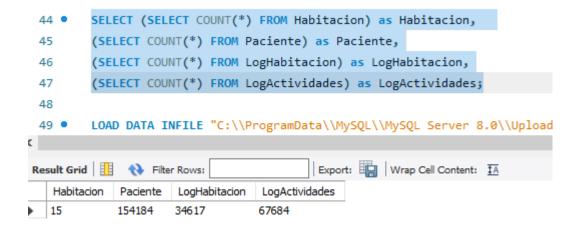
15: Restauración de backup incremental 5

```
C:\Users\Wilson.Perez>mysql -u root -p practica1_db2 < backupIncremental_5v.sql
Enter password: ******
SELECT * FROM cada tabla
        SELECT * FROM LogActividades;
 42 •
 43
        SELECT (SELECT COUNT(*) FROM Habitacion) as Habitacion,
        (SELECT COUNT(*) FROM Paciente) as Paciente,
 45
        (SELECT COUNT(*) FROM LogHabitacion) as LogHabitacion,
 46
        (SELECT COUNT(*) FROM LogActividades) as LogActividades;
 47
 48
        LOAD DATA INFILE "C:\\ProgramData\\MySQL\\MySQL Server 8.0\\Uploads\\Pacientes.csv"
 49 •
                                                                                         ‡А
```

| 1 | Result Grid 🔢 🔌 | Filter Rows: | Edit: 🚄 📆 🟪 Export/Import: 🏢 | Wrap | Cell Content: 1 |
|---|------------------|----------------------|--|--------------|-----------------|
| | idLogActividades | timestampx | actividad | idHabitacion | idPaciente |
| ۰ | 1 | 5/31/2021 7:12:14 AM | Paciente inicia el registro. | 10 | 134247 |
| | 2 | 5/31/2021 7:13:16 AM | Paciente recibe papeleria en recepcion. | 10 | 134247 |
| | 3 | 5/31/2021 7:15:54 AM | Paciente entrega papeleria. | 10 | 134247 |
| | 4 | 5/31/2021 7:16:33 AM | Recepcionista establece la condicion del pacient | 10 | 134247 |
| | 5 | 5/31/2021 7:17:47 AM | Enfermera comienza la revision del paciente. | 10 | 134247 |
| | | | | | |



SELECT COUNT(*) FROM cada tabla



Análisis de los Resultados

Tabla de tiempos en creación

| Tipo de Backup | Dia | Acción | Tiempo (s) |
|----------------|-----|----------|------------|
| Full 1 | 1 | Creación | 2.204 |
| Full 2 | 2 | Creación | 3.208 |
| Full 3 | 3 | Creación | 2.971 |
| Full 4 | 4 | Creación | 5.213 |
| Full 5 | 5 | Creación | 5.081 |
| Incremental 1 | 1 | Creación | 0.060 |
| Incremental 2 | 2 | Creación | 0.032 |
| Incremental 3 | 3 | Creación | 0.033 |
| Incremental 4 | 4 | Creación | 0.032 |
| Incremental 5 | 5 | Creación | 0.030 |
| | | | |

Tabla de tiempos de restauración

| Tipo de Backup | Dia | Acción | Tiempo (s) |
|----------------|-----|--------------|------------|
| Full 1 | 6 | Restauración | 3.004 |
| Full 2 | 7 | Restauración | 5.671 |
| Full 3 | 8 | Restauración | 4.656 |

| Full 4 | 9 | Restauración | 5.05 |
|---------------|----|--------------|-------|
| Full 5 | 10 | Restauración | 5.65 |
| Incremental 1 | 11 | Restauración | 0.060 |
| Incremental 2 | 12 | Restauración | 0 |
| Incremental 3 | 13 | Restauración | 0 |
| Incremental 4 | 14 | Restauración | 0 |
| Incremental 5 | 15 | Restauración | 0 |
| | | | |

En base a los resultados proporcionados en las tablas anteriores, que detallan el tiempo necesario para realizar cada backup y su correspondiente proceso de restauración, observamos una consistencia notable en los tiempos. Las variaciones entre un backup y otro son mínimas, tanto en la fase de creación como en la de restauración.

Sin embargo, al realizar una comparación específica entre el tiempo dedicado a la ejecución de backups completos y backups incrementales, se destaca una diferencia significativa. Los backups incrementales se llevan a cabo en un tiempo notablemente menor en comparación con sus contrapartes completas, incluso no sobrepasaron el segundo . Esto sugiere una eficiencia considerable al adoptar estrategias de respaldo incrementales en nuestro sistema de base de datos.

En bases de datos más extensas, el tiempo se convierte en un factor crucial. Por ello, se podría contemplar la opción del backup incremental como un equilibrio efectivo entre la eficiencia en el uso de recursos y la capacidad de lograr una recuperación más detallada.

Conclusiones

- La implementación de backups incrementales junto con backups completos permite una gestión eficiente del tiempo y recursos. Ambas aseguran respaldos rápidos y frecuentes, optimizando el uso de los recursos del sistema.
- El Backup Incremental es más complejo en realizar, pero el tiempo de respuesta tanto en la creación como en la restauración, permiten una mejor eficiencia tanto de recursos como de tiempo. En bases de datos más grandes, los dos factores, tiempo y eficiencia, pueden tener un gran peso.

 Al seleccionar el backup incremental como primera opción, se garantiza una mayor granularidad en la recuperación de datos. Esto facilita la restauración precisa hasta momentos cercanos en el tiempo, reduciendo la pérdida de información en situaciones críticas.