PRACTICA 01

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DESCRIPCIÓN BREVE

Este documento trata sobre los respaldos de copias de seguridad utilizados en la gestión de la información y la seguridad de los datos.

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INTRODUCCIÓN

En el entorno dinámico y crucial de la gestión de datos, la práctica de realizar copias de seguridad de bases de datos emerge como un componente fundamental para salvaguardar la integridad y disponibilidad de la información crítica. Las bases de datos, siendo el epicentro de almacenamiento y recuperación de datos en diversos contextos, son propensas a enfrentar desafíos que van desde errores humanos hasta eventos imprevisibles como fallos de hardware o ataques cibernéticos. El propósito esencial de las copias de seguridad de bases de datos radica en garantizar la continuidad operativa y la recuperación eficiente ante posibles pérdidas de datos. Esta práctica no solo constituye una medida preventiva, sino que también se erige como un pilar esencial para la seguridad y la confiabilidad de la información, respaldando la toma de decisiones informadas y la resiliencia de las organizaciones frente a posibles contratiempos. En esta exploración, examinaremos a fondo la importancia, los métodos y las mejores prácticas asociadas con la realización de copias de seguridad de bases de datos, destacando su papel crítico en el mantenimiento de la vitalidad de la infraestructura de datos en entornos empresariales y tecnológicos en constante evolución.

Objetivo: Optimizar la seguridad y la disponibilidad de datos mediante la implementación efectiva de copias de seguridad de bases de datos, con el fin de prevenir pérdidas de información, garantizar la continuidad operativa y fortalecer la capacidad de recuperación frente a eventos adversos.

Descripción: Realizar las siguientes tareas en MySQL:

- Importar una base de datos
- Realizar una copia de seguridad de una base de datos
- Realizar cambios en una base de datos
- Restaurar una base de datos a una versión anterior
- Subir un directorio a un repositorio Git

Materiales

- Un ordenador con MySQL instalado
- El script de la base de datos de veterinario
- Un cliente Git

Pasos a seguir

1. Importar la base de datos
2. Realizar una copia de seguridad de la base de datos
    a. sudo xtrabackup --backup --target-dir=/ruta/base
    b. xtrabackup --verify --target-dir=/ruta/de/la/copia/realizada
    c. xtrabackup --flush-logs --target-dir=/ruta/de/la/copia/realizada
3. Realizar cambios en la base de datos

   a. Realice al menos 3 registros en cada tabla de la base de datos. Para ello, puede utilizar cualquier herramienta de gestión de bases de datos, como MySQL Workbench o phpMyAdmin.
4. Restaurar la base de datos a la versión inicial
   a. Detener el servidor MySQL sudo service mysql stop
   b. Mover el datadir de mysql a una carpeta temporal*** sudo mv /var/lib/mysql /var/lib/mysql_backup
   c. Remover el datadir actual sudo rm -rf /var/lib/mysql
   d. Preparar la copia de seguridad xtrabackup --prepare --target-dir=/ruta/base
   e. Restaurar la copia de seguridad sudo xtrabackup --copy-back --target-dir=/ruta/base --datadir=/var/lib/mysql
   f. Restablecer permisos al datadir sudo chown -R mysql:mysql /var/lib/mysql
   g. Reiniciar el servicio sudo service mysql start
5. Comprobar que los cambios se ven reflejados
   a. Verifique que los cambios realizados en la base de datos se han perdido tras la restauración. Para ello, puede utilizar cualquier herramienta de gestión de bases de datos.
6. Subir el directorio de la copia base a un repositorio Git
   a. Suba el directorio de la copia base de la base de datos a un repositorio Git privado invitando a “carsimax como colaborador”.
   b. nombre: **“ABD_P101_GRADO_GRUPO_APATERNO_AMATERNO_NOMBRE”**

Reporte de la práctica
El reporte de la práctica debe incluir los siguientes elementos:

- Una introducción que explique el objetivo de la práctica.
- Una descripción de los pasos realizados.
- Capturas de pantalla que muestran los resultados de cada paso.

Entregables
Los entregables de la práctica son:

- El reporte de la práctica.
- El repositorio Git con el directorio de la copia base de la base de datos.

Plazo de entrega. La práctica debe ser entregada antes del día 21 de Enero de 2024.

Evaluación
La práctica será evaluada en base a los siguientes criterios:

- Correctitud de los pasos realizados.
- Calidad de las capturas de pantalla.
- Organización y claridad del reporte.

Recomendaciones

- Es importante realizar los pasos de la práctica en el orden indicado.
- Es recomendable guardar las capturas de pantalla en formato PNG o JPG.
- El reporte de la práctica debe ser claro y conciso.

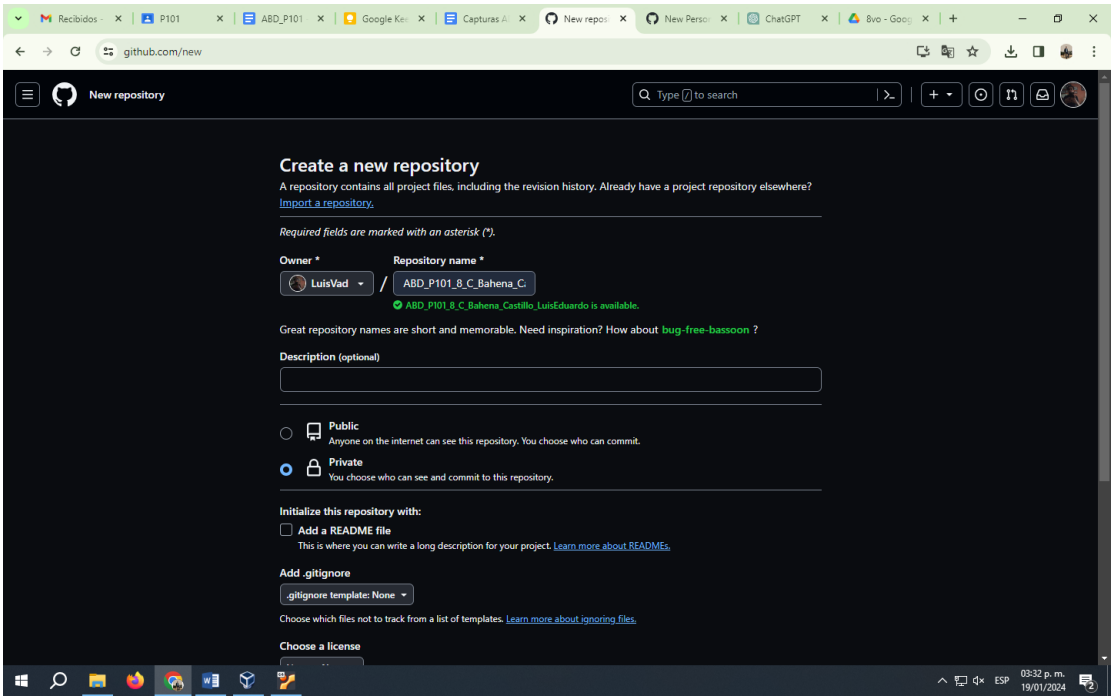
DESARROLLO

¿Qué es una copia de seguridad? Las copias de seguridad son una parte esencial de la seguridad de la información, donde permite recuperar los datos en caso de pérdida o corrupción.

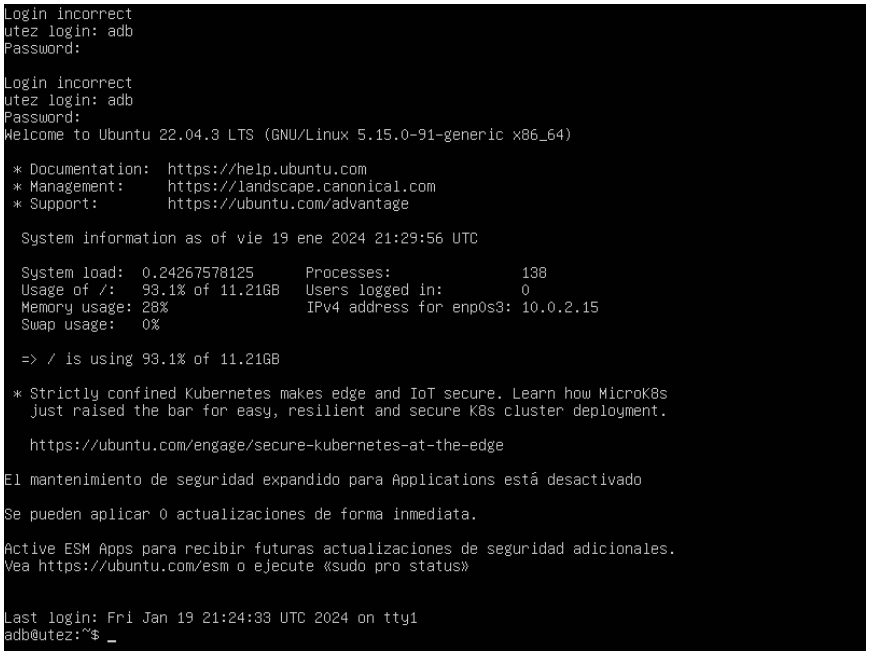
Pasos para crear una copia de seguridad

En la práctica de copias de seguridad de bases de datos, la introducción destaca la importancia de preservar la integridad de los datos. Este proceso vital implica pasos clave como identificar datos críticos, establecer frecuencias de respaldo y utilizar métodos seguros, asegurando así la resiliencia ante posibles pérdidas o incidentes.

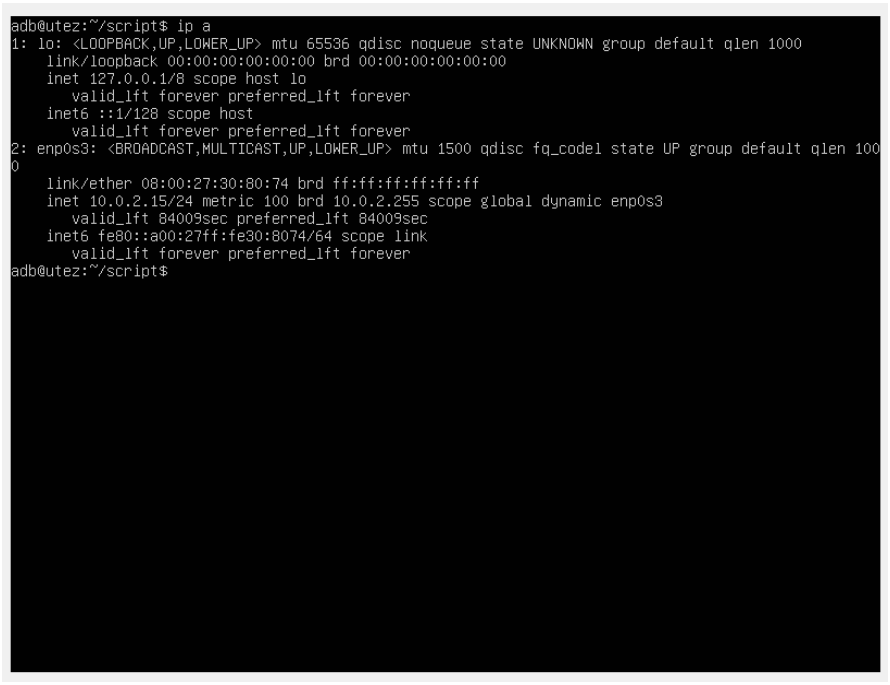
Paso 1: Crear un repositorio con la nomenclatura "**ABD_P101_8_C_Bahena_Castillo_LuisEduardo**" en Github para guardar nuestra copia de base de datos.



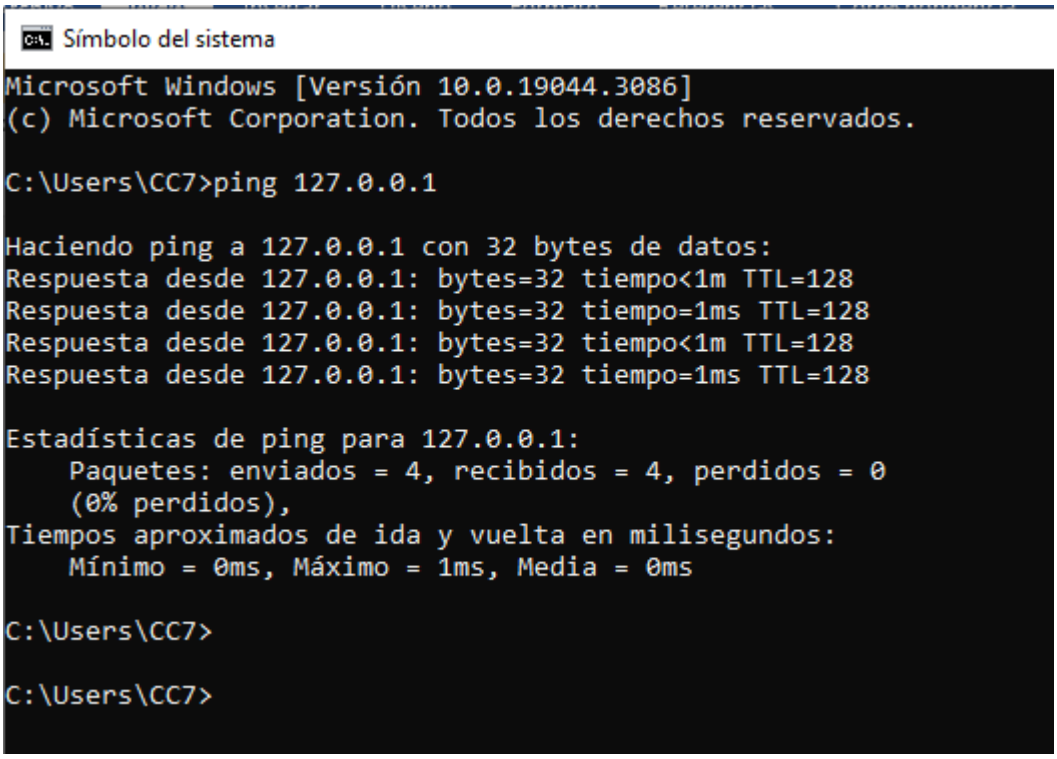
Paso 2: Acceder a la máquina virtual de ubuntu con las credenciales correspondientes (**usuario: adb, password: admin**)



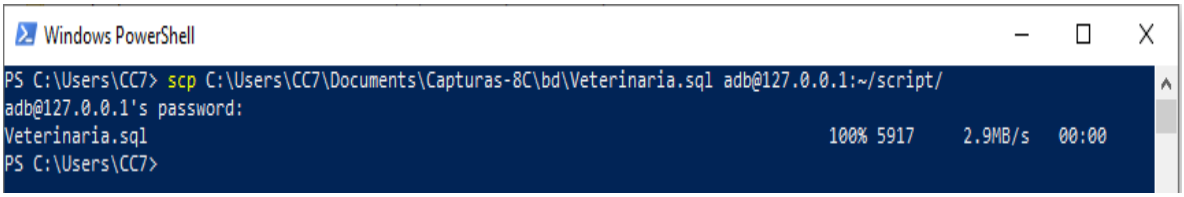
Paso 3: Desde la máquina virtual con comando **ip a** verificar que dirección ip es la que se está utilizando (en este caso se utilizará la primera que muestra **127.0.0.1**).



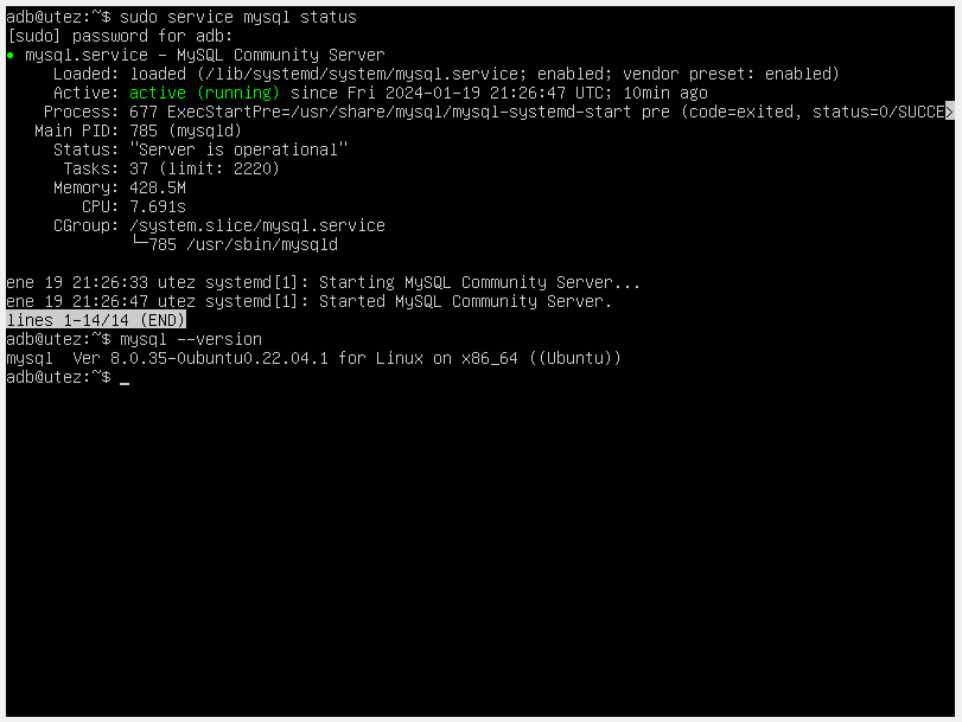
Paso 4: Desde Windows, realizar el comando **ping** a la máquina virtual para verificar si utiliza la dirección correctamente.



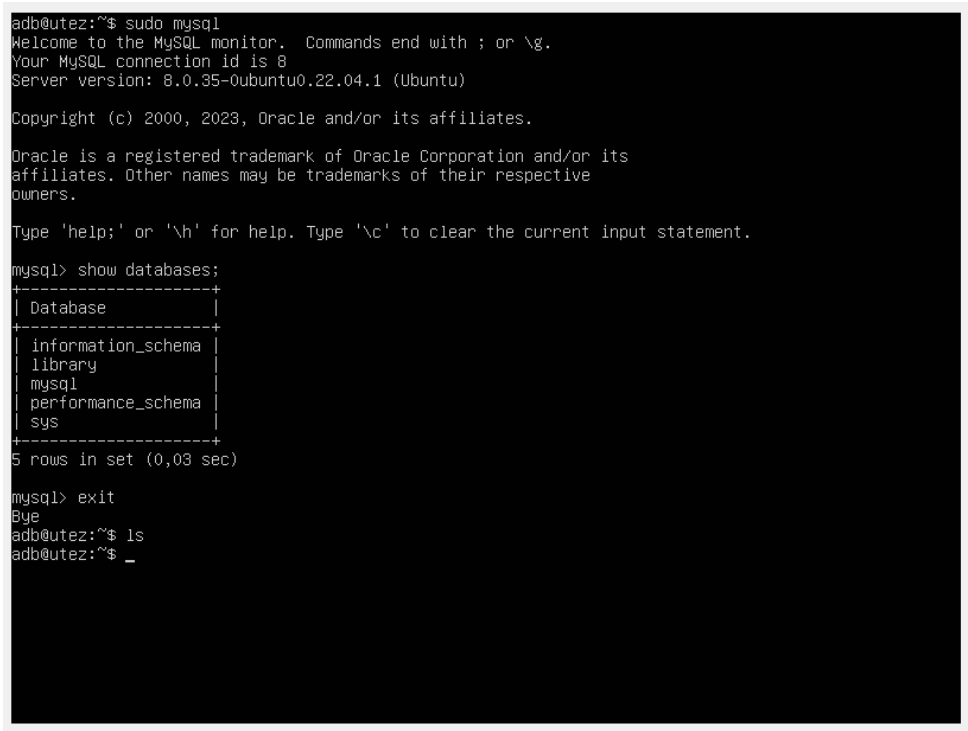
Paso 5: Desde Windows, pasar el archivo sql descargado (Veterinaria.sql) a la máquina virtual de ubuntu de acuerdo a la dirección ip mostrada anteriormente



Paso 6: Verificar que el servicio de MySQL en linux esté ejecutando correctamente



Paso 7: Acceder a la base de datos con usuario y contraseña (admin, admin123) para verificar que el acceso sea correctamente las credenciales, así también mostrar las base de datos existentes



Paso 8: Crear una base de datos llamada **veterinaria** para poder ejecutar el script con los registros que ya están predeterminados (verificar con comando **show tables** para garantizar que no haya tablas creadas).

```
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| library            |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
5 rows in set (0,00 sec)

mysql> create database veterinaria;
Query OK, 1 row affected (0,02 sec)

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| library            |
| mysql              |
| performance_schema |
| sys                |
| veterinaria        |
+--------------------+
6 rows in set (0,00 sec)

mysql> use veterinaria;
Database changed
mysql> show tables;
Empty set (0,00 sec)

mysql> _
```

Paso 9: Con comando **mysql -u admin -padmin123 veterinaria < Veterinaria.sql**, ubicarnos a nuestro archivo de script para ejecutarlo correctamente en la base de datos creada.

```
adb@utez:~$ cd script/
adb@utez:~/script$ ls
Veterinaria.sql
adb@utez:~/script$ mysql -u admin -padmin123 veterinaria < Veterinaria.sql
mysql: [Warning] Using a password on the command line interface can be insecure.
adb@utez:~/script$ sudo mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 18
Server version: 8.0.35-0ubuntu0.22.04.1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| library            |
| mysql              |
| performance_schema |
| sys                |
| veterinaria        |
+--------------------+
6 rows in set (0,00 sec)

mysql> use veterinaria;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> _
```

Paso 10: Seleccionar la base de datos con **use veterinaria**, y con **show tables** mostrar que haya tablas en la base de datos seleccionada.

```
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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| library            |
| mysql              |
| performance_schema |
| sys                |
| veterinaria        |
+--------------------+
6 rows in set (0,00 sec)

mysql> use veterinaria;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+-----------------------+
| Tables_in_veterinaria |
+-----------------------+
| appointments          |
| appointments_vets     |
| clients               |
| pets                  |
| vets                  |
+-----------------------+
5 rows in set (0,00 sec)

mysql> _
```

Paso 11: Realizar las inserciones correspondientes a cada tabla. Primero se hace una inserción a la tabla clients con **insert into clients** y se verifica con **select * from clients**

```
| created_at | timestamp       | NO   |     | CURRENT_TIMESTAMP | DEFAULT_GENERATED |
+------------+-----------------+------+-----+-------------------+-------------------+
4 rows in set (0,03 sec)

mysql> insert into clients (name, last_name) values (0, 'Kayne', 'West'), (0, 'Taylor', 'Swift'), (0
, 'Abel', 'Tesfaye')
    -> ;
ERROR 1136 (21S01): Column count doesn't match value count at row 1
mysql> insert into clients (name, last_name) values (0, 'Kayne', 'West'), (0, 'Taylor', 'Swift'), (0
, 'Abel', 'Tesfaye');
ERROR 1136 (21S01): Column count doesn't match value count at row 1
mysql> insert into clients (name, last_name) values ('Kayne', 'West'), ('Taylor', 'Swift'), ('Abel',
 'Tesfaye');
Query OK, 3 rows affected (0,04 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from clients;
+----+--------+-----------+---------------------+
| id | name   | last_name | created_at          |
+----+--------+-----------+---------------------+
|  1 | John   | Doe       | 2024-01-19 22:32:13 |
|  2 | Jane   | Doe       | 2024-01-19 22:32:13 |
|  3 | John   | Smith     | 2024-01-19 22:32:13 |
|  4 | Jane   | Smith     | 2024-01-19 22:32:13 |
|  5 | John   | Johnson   | 2024-01-19 22:32:13 |
|  6 | Jane   | Johnson   | 2024-01-19 22:32:13 |
|  7 | John   | Williams  | 2024-01-19 22:32:13 |
|  8 | Jane   | Williams  | 2024-01-19 22:32:13 |
|  9 | John   | Brown     | 2024-01-19 22:32:13 |
| 10 | Jane   | Brown     | 2024-01-19 22:32:13 |
| 11 | Kayne  | West      | 2024-01-19 22:43:37 |
| 12 | Taylor | Swift     | 2024-01-19 22:43:37 |
| 13 | Abel   | Tesfaye   | 2024-01-19 22:43:37 |
+----+--------+-----------+---------------------+
13 rows in set (0,00 sec)

mysql> _
```

Seguido se hace inserción a la tabla pets con **insert into pets** y se verifica con **select * from pets**

```
mysql> select * from pets;
+----+----------+------+------------------+----------+---------------------+
| id | name     | type | breed            | owner_id | created_at          |
+----+----------+------+------------------+----------+---------------------+
|  1 | Max      | Dog  | Labrador         |        1 | 2024-01-19 22:32:13 |
|  2 | Buddy    | Dog  | Golden Retriever |        2 | 2024-01-19 22:32:13 |
|  3 | Charlie  | Dog  | French Bulldog   |        3 | 2024-01-19 22:32:13 |
|  4 | Jack     | Dog  | German Shepherd  |        4 | 2024-01-19 22:32:13 |
|  5 | Cooper   | Dog  | Poodle           |        5 | 2024-01-19 22:32:13 |
|  6 | Milo     | Cat  | Persian          |        6 | 2024-01-19 22:32:13 |
|  7 | Simba    | Cat  | Siamese          |        7 | 2024-01-19 22:32:13 |
|  8 | Leo      | Cat  | Sphynx           |        8 | 2024-01-19 22:32:13 |
|  9 | Lucy     | Cat  | Persian          |        6 | 2024-01-19 22:32:13 |
| 10 | Luna     | Cat  | Siamese          |        7 | 2024-01-19 22:32:13 |
| 11 | EL N     | Dog  | Aleman           |        7 | 2024-01-19 22:50:20 |
| 12 | JSA      | Dog  | French Pug       |        3 | 2024-01-19 22:50:20 |
| 13 | Tikamina | Cat  | Japanase         |        5 | 2024-01-19 22:50:20 |
+----+----------+------+------------------+----------+---------------------+
13 rows in set (0,00 sec)

mysql>
```

Posteriormente se hace inserción a la tabla vets con **insert into vets** y se verifica con **select * from vets**

```
mysql> select * from vets;
+----+-----------+-----------+----------------+------------+---------------------+
| id | name      | last_name | specialty      | experience | created_at          |
+----+-----------+-----------+----------------+------------+---------------------+
|  1 | John      | Doe       | Dentist        |         10 | 2024-01-19 22:32:13 |
|  2 | Jane      | Doe       | Dentist        |         10 | 2024-01-19 22:32:13 |
|  3 | John      | Smith     | Surgeon        |         15 | 2024-01-19 22:32:13 |
|  4 | Jane      | Smith     | Surgeon        |         15 | 2024-01-19 22:32:13 |
|  5 | John      | Johnson   | Dermatologist  |         20 | 2024-01-19 22:32:13 |
|  6 | Jane      | Johnson   | Dermatologist  |         20 | 2024-01-19 22:32:13 |
|  7 | John      | Williams  | Ophthalmologist|         25 | 2024-01-19 22:32:13 |
|  8 | Jane      | Williams  | Ophthalmologist|         25 | 2024-01-19 22:32:13 |
|  9 | John      | Brown     | Cardiologist   |         30 | 2024-01-19 22:32:13 |
| 10 | Jane      | Brown     | Cardiologist   |         30 | 2024-01-19 22:32:13 |
| 11 | Cristiano | Ronaldo   | Dentist        |         17 | 2024-01-23 00:42:42 |
| 12 | Lionel    | Messi     | Cardiologist   |         20 | 2024-01-23 00:42:42 |
| 13 | Uriel     | Antuna    | Surgeon        |         15 | 2024-01-23 00:42:42 |
+----+-----------+-----------+----------------+------------+---------------------+
13 rows in set (0,00 sec)

mysql>
```

Finalmente se hace inserción a las tablas appointments y appointments_vets con **insert into** y se verifica con **select * from**

```
mysql> insert into appointments (pet_id, client_id, date) values (11, 11, '2024-01-19 15:00:00'), (1
2, 12, '2024-01-19 15:00:00'), (13, 13, '2024-01-19 15:00:00');
Query OK, 3 rows affected (0,01 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from appointments;
+----+--------+-----------+---------------------+---------------------+
| id | pet_id | client_id | date                | created_at          |
+----+--------+-----------+---------------------+---------------------+
|  1 |      1 |         1 | 2021-01-01 10:00:00 | 2024-01-19 22:32:13 |
|  2 |      2 |         2 | 2021-01-01 11:00:00 | 2024-01-19 22:32:13 |
|  3 |      3 |         3 | 2021-01-01 12:00:00 | 2024-01-19 22:32:13 |
|  4 |      4 |         4 | 2021-01-01 13:00:00 | 2024-01-19 22:32:13 |
|  5 |      5 |         5 | 2021-01-01 14:00:00 | 2024-01-19 22:32:13 |
|  6 |      6 |         6 | 2021-01-01 15:00:00 | 2024-01-19 22:32:13 |
|  7 |      7 |         7 | 2021-01-01 16:00:00 | 2024-01-19 22:32:13 |
|  8 |      8 |         8 | 2021-01-01 17:00:00 | 2024-01-19 22:32:13 |
|  9 |      9 |         9 | 2021-01-01 18:00:00 | 2024-01-19 22:32:13 |
| 10 |     10 |        10 | 2021-01-01 19:00:00 | 2024-01-19 22:32:13 |
| 11 |     11 |        11 | 2024-01-19 15:00:00 | 2024-01-23 00:47:27 |
| 12 |     12 |        12 | 2024-01-19 15:00:00 | 2024-01-23 00:47:27 |
| 13 |     13 |        13 | 2024-01-19 15:00:00 | 2024-01-23 00:47:27 |
+----+--------+-----------+---------------------+---------------------+
13 rows in set (0,00 sec)

mysql>
```

```
mysql> insert into appointments_vets (appointment_id, vet_id) values (11, 11), (12, 12), (13, 13);
Query OK, 3 rows affected (0,03 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from appointments_vets;
+----+----------------+--------+---------------------+
| id | appointment_id | vet_id | created_at          |
+----+----------------+--------+---------------------+
|  1 |              1 |      1 | 2024-01-19 22:32:13 |
|  2 |              2 |      2 | 2024-01-19 22:32:13 |
|  3 |              3 |      3 | 2024-01-19 22:32:13 |
|  4 |              4 |      4 | 2024-01-19 22:32:13 |
|  5 |              5 |      5 | 2024-01-19 22:32:13 |
|  6 |              6 |      6 | 2024-01-19 22:32:13 |
|  7 |              7 |      7 | 2024-01-19 22:32:13 |
|  8 |              8 |      8 | 2024-01-19 22:32:13 |
|  9 |              9 |      9 | 2024-01-19 22:32:13 |
| 10 |             10 |     10 | 2024-01-19 22:32:13 |
| 11 |             11 |     11 | 2024-01-23 00:50:48 |
| 12 |             12 |     12 | 2024-01-23 00:50:48 |
| 13 |             13 |     13 | 2024-01-23 00:50:48 |
+----+----------------+--------+---------------------+
13 rows in set (0,00 sec)

mysql> _
```

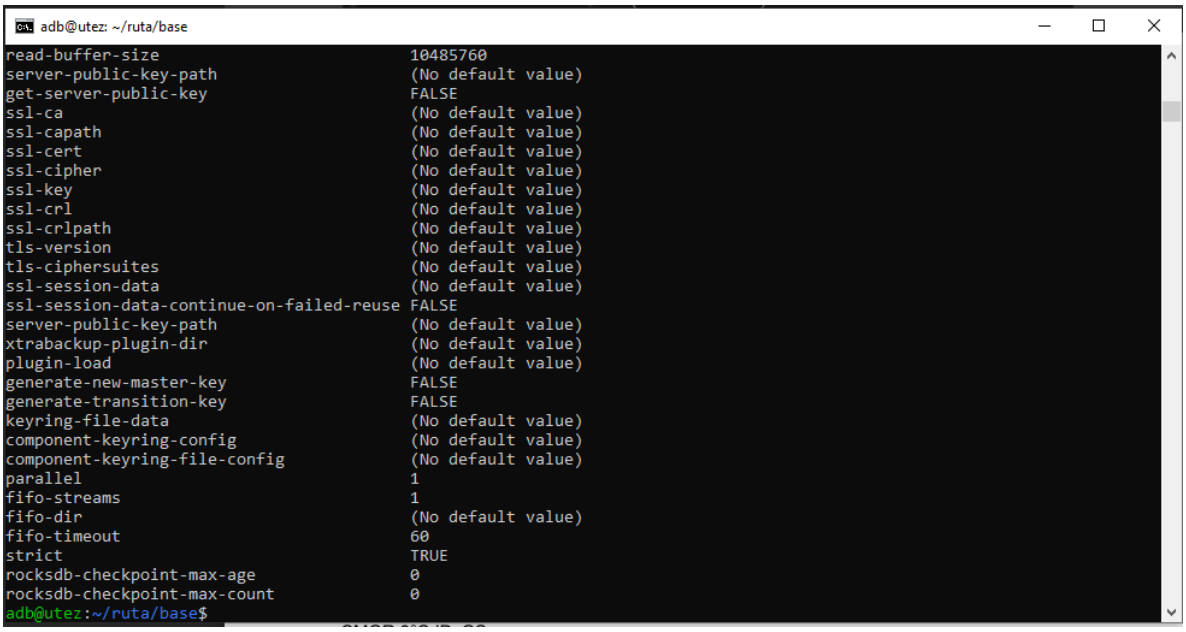
Paso 12: Ahora procederemos a crear un respaldo para la copia de seguridad completa con comando **mkdir** al directorio a guardar (en este caso es **mkdir ruta** y **mkdir ruta/base**), para después con el comando de xtrabackup, creemos un respaldo hacia la dirección creada anteriormente: `sudo xtrabackup --backup --target-dir=/home/adb/ruta/base`

```
g.index
2024-01-23T01:06:11.310904-00:00 0 [Note] [MY-011825] [Xtrabackup] Done: Writing file /home/adb/ruta
/base/binlog.index
2024-01-23T01:06:11.318734-00:00 0 [Note] [MY-011825] [Xtrabackup] Writing /home/adb/ruta/base/xtrab
ackup_binlog_info
2024-01-23T01:06:11.318821-00:00 0 [Note] [MY-011825] [Xtrabackup] Done: Writing file /home/adb/ruta
/base/xtrabackup_binlog_info
2024-01-23T01:06:11.321997-00:00 0 [Note] [MY-011825] [Xtrabackup] Executing FLUSH NO_WRITE_TO_BINLO
G ENGINE LOGS...
2024-01-23T01:06:11.323747-00:00 0 [Note] [MY-011825] [Xtrabackup] The latest check point (for incre
mental): '21620080'
2024-01-23T01:06:11.323780-00:00 0 [Note] [MY-011825] [Xtrabackup] Stopping log copying thread at LS
N 21620080
2024-01-23T01:06:11.323866-00:00 1 [Note] [MY-011825] [Xtrabackup] Starting to parse redo log at lsn
 = 21619775
2024-01-23T01:06:11.352387-00:00 0 [Note] [MY-011825] [Xtrabackup] Executing UNLOCK INSTANCE
2024-01-23T01:06:11.352651-00:00 0 [Note] [MY-011825] [Xtrabackup] All tables unlocked
2024-01-23T01:06:11.352727-00:00 0 [Note] [MY-011825] [Xtrabackup] Copying ib_buffer_pool to /home/a
db/ruta/base/ib_buffer_pool
2024-01-23T01:06:11.352749-00:00 0 [Note] [MY-011825] [Xtrabackup] Done: Copying ib_buffer_pool to /
home/adb/ruta/base/ib_buffer_pool
2024-01-23T01:06:11.355001-00:00 0 [Note] [MY-011825] [Xtrabackup] Backup created in directory '/hom
e/adb/ruta/base/'
2024-01-23T01:06:11.355027-00:00 0 [Note] [MY-011825] [Xtrabackup] MySQL binlog position: filename '
binlog.000015', position '157'
2024-01-23T01:06:11.355083-00:00 0 [Note] [MY-011825] [Xtrabackup] Writing /home/adb/ruta/base/backu
p-my.cnf
2024-01-23T01:06:11.355155-00:00 0 [Note] [MY-011825] [Xtrabackup] Done: Writing file /home/adb/ruta
/base/backup-my.cnf
2024-01-23T01:06:11.358430-00:00 0 [Note] [MY-011825] [Xtrabackup] Writing /home/adb/ruta/base/xtrab
ackup_info
2024-01-23T01:06:11.358519-00:00 0 [Note] [MY-011825] [Xtrabackup] Done: Writing file /home/adb/ruta
/base/xtrabackup_info
2024-01-23T01:06:12.364457-00:00 0 [Note] [MY-011825] [Xtrabackup] Transaction log of lsn (21620080)
 to (21620080) was copied.
2024-01-23T01:06:12.641162-00:00 0 [Note] [MY-011825] [Xtrabackup] completed OK!
adb@utez:~$
```

Paso 13: Verificar en la ruta establecida que los archivos se hayan creado correctamente.

```
adb@utez:~$ cd /home/adb/ruta/base
adb@utez:~/ruta/base$ ls
backup-my.cnf   ibdata1    performance_schema  veterinaria            xtrabackup_logfile
binlog.000015   library    sys                 xtrabackup_binlog_info  xtrabackup_tablespaces
binlog.index    mysql      undo_001            xtrabackup_checkpoints
ib_buffer_pool  mysql.ibd  undo_002            xtrabackup_info
adb@utez:~/ruta/base$ _
```

Paso 14: Con comandos `xtrabackup --verify --target-dir=/home/adb/ruta/base` y `xtrabackup --flush-logs --target-dir=/home/adb/ruta/base` verificar que también los archivos estén correctamente ubicados.



Paso 15: Checar el status de la ejecución de mysql y procederemos a desactivarlo para realizar los procesos de preparación y restauración de la base de datos.

```
adb@utez:~/ruta/base$ sudo service mysql stop
adb@utez:~/ruta/base$ sudo service mysql status
o mysql.service - MySQL Community Server
     Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
     Active: inactive (dead) since Tue 2024-01-23 01:16:14 UTC; 2s ago
    Process: 673 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
    Process: 785 ExecStart=/usr/sbin/mysqld (code=exited, status=0/SUCCESS)
   Main PID: 785 (code=exited, status=0/SUCCESS)
     Status: "Server shutdown complete"
        CPU: 37.429s

ene 23 00:13:10 utez systemd[1]: Starting MySQL Community Server...
ene 23 00:13:22 utez systemd[1]: Started MySQL Community Server.
ene 23 01:16:12 utez systemd[1]: Stopping MySQL Community Server...
ene 23 01:16:14 utez systemd[1]: mysql.service: Deactivated successfully.
ene 23 01:16:14 utez systemd[1]: Stopped MySQL Community Server.
ene 23 01:16:14 utez systemd[1]: mysql.service: Consumed 37.429s CPU time.
adb@utez:~/ruta/base$
```

Paso 16: Después, acceder a los archivos originales de mysql y mover a una carpeta temporal de acuerdo al siguiente comando: `sudo mv /var/lib/mysql /var/lib/mysql_backup`

```
adb@utez:~/ruta/base$ sudo mv /var/lib/mysql /var/lib/mysql_backup
adb@utez:~/ruta/base$ ls -la /var/lib/mysql
ls: cannot access '/var/lib/mysql': No such file or directory
adb@utez:~/ruta/base$ ls -la /var/lib/mysql_backup
ls: cannot open directory '/var/lib/mysql_backup': Permission denied
adb@utez:~/ruta/base$ sudo ls -la /var/lib/mysql_backup
total 80416
drwxr-x---  9 mysql mysql     4096 ene 23 01:16  .
drwxr-xr-x 44 root  root      4096 ene 23 01:17  ..
-rw-r-----  1 mysql mysql       56 ene 14 02:06  auto.cnf
-rw-r-----  1 mysql mysql      157 ene 14 02:08  binlog.000007
-rw-r-----  1 mysql mysql      180 ene 14 02:11  binlog.000008
-rw-r-----  1 mysql mysql      157 ene 18 22:22  binlog.000009
-rw-r-----  1 mysql mysql      157 ene 18 22:27  binlog.000010
-rw-r-----  1 mysql mysql      157 ene 19 21:23  binlog.000011
-rw-r-----  1 mysql mysql      157 ene 19 21:26  binlog.000012
-rw-r-----  1 mysql mysql    39127 ene 23 00:13  binlog.000013
-rw-r-----  1 mysql mysql     1380 ene 23 01:06  binlog.000014
-rw-r-----  1 mysql mysql      180 ene 23 01:16  binlog.000015
-rw-r-----  1 mysql mysql      142 ene 23 01:06  binlog.index
-rw-------  1 mysql mysql     1705 ene 14 02:08  ca-key.pem
-rw-r--r--  1 mysql mysql     1112 ene 14 02:08  ca.pem
-rw-r--r--  1 mysql mysql     1112 ene 14 02:08  client-cert.pem
-rw-------  1 mysql mysql     1705 ene 14 02:08  client-key.pem
-rw-r-----  1 mysql mysql   196608 ene 23 01:06 '#ib_16384_0.dblwr'
-rw-r-----  1 mysql mysql  8585216 ene 14 02:08 '#ib_16384_1.dblwr'
-rw-r-----  1 mysql mysql     3805 ene 23 01:16  ib_buffer_pool
-rw-r-----  1 mysql mysql 12582912 ene 23 01:16  ibdata1
drwxr-x---  2 mysql mysql     4096 ene 23 00:13 '#innodb_redo'
drwxr-x---  2 mysql mysql     4096 ene 23 01:16 '#innodb_temp'
drwxr-x---  2 mysql mysql     4096 ene 14 02:01  library
drwxr-x---  2 mysql mysql     4096 ene 14 02:01  mysql
-rw-r-----  1 mysql mysql 27262976 ene 23 00:50  mysql.ibd
drwxr-x---  2 mysql mysql     4096 ene 14 02:01  performance_schema
-rw-------  1 mysql mysql     1705 ene 14 02:08  private_key.pem
-rw-r--r--  1 mysql mysql      452 ene 14 02:08  public_key.pem
-rw-r--r--  1 mysql mysql     1112 ene 14 02:08  server-cert.pem
-rw-------  1 mysql mysql     1705 ene 14 02:08  server-key.pem
drwxr-x---  2 mysql mysql     4096 ene 14 02:01  sys
-rw-r-----  1 mysql mysql 16777216 ene 23 00:52  undo_001
-rw-r-----  1 mysql mysql 16777216 ene 23 00:52  undo_002
drwxr-x---  2 mysql mysql     4096 ene 19 22:32  veterinaria
-rw-r-----  1 mysql mysql      534 ene 14 02:01  xtrabackup_info
adb@utez:~/ruta/base$
```

Paso 17: Verificar en la ruta /var/lib/mysql que no exista para remover el directorio con comando **rm -rf** donde se borrará todo (simulando a un error humano)

```
adb@utez:~/ruta/base$ sudo rm -rf /var/lib/mysql
adb@utez:~/ruta/base$ sudo ls -la /var/lib/mysql
ls: cannot access '/var/lib/mysql': No such file or directory
adb@utez:~/ruta/base$
```

Paso 18: Posteriormente, procederemos a preparar la copia de seguridad completa donde accederemos a la dirección de respaldo creada anteriormente con comando de **xtrabackup**: `sudo xtrabackup --prepare --target-dir=/home/adb/ruta/base`, al final nos tiene que dar **complete OK.**

```
2024-01-23T01:27:03.914636-00:00 0 [Note] [MY-012948] [InnoDB] Compressed tables use zlib 1.2.13
2024-01-23T01:27:03.915060-00:00 0 [Note] [MY-012951] [InnoDB] Using hardware accelerated crc32 and polynomial multiplication.
2024-01-23T01:27:03.915656-00:00 0 [Note] [MY-012203] [InnoDB] Directories to scan './'
2024-01-23T01:27:03.915784-00:00 0 [Note] [MY-012204] [InnoDB] Scanning './'
2024-01-23T01:27:03.961781-00:00 0 [Note] [MY-012208] [InnoDB] Completed space ID check of 18 files.
2024-01-23T01:27:03.962479-00:00 0 [Note] [MY-012955] [InnoDB] Initializing buffer pool, total size = 128.000000M, instances = 1, chunk size =128.000000M
2024-01-23T01:27:03.986681-00:00 0 [Note] [MY-012957] [InnoDB] Completed initialization of buffer pool
2024-01-23T01:27:03.992038-00:00 0 [Note] [MY-011951] [InnoDB] page_cleaner coordinator priority: -20
2024-01-23T01:27:03.992271-00:00 0 [Note] [MY-011954] [InnoDB] page_cleaner worker priority: -20
2024-01-23T01:27:03.992550-00:00 0 [Note] [MY-011954] [InnoDB] page_cleaner worker priority: -20
2024-01-23T01:27:03.992856-00:00 0 [Note] [MY-011954] [InnoDB] page_cleaner worker priority: -20
2024-01-23T01:27:04.062363-00:00 0 [Note] [MY-013883] [InnoDB] The latest found checkpoint is at lsn = 21620080 in redo log file ./#innodb_redo/#ib_redo0.
2024-01-23T01:27:04.062468-00:00 0 [Note] [MY-012560] [InnoDB] The log sequence number 20923150 in the system tablespace does not match the log sequence number 21620080 in the r
edo log files!
2024-01-23T01:27:04.062507-00:00 0 [Note] [MY-012551] [InnoDB] Database was not shutdown normally!
2024-01-23T01:27:04.062785-00:00 0 [Note] [MY-012552] [InnoDB] Starting crash recovery.
2024-01-23T01:27:04.063256-00:00 0 [Note] [MY-013086] [InnoDB] Starting to parse redo log at lsn = 21619775, whereas checkpoint_lsn = 21620080 and start_lsn = 21619712
2024-01-23T01:27:04.063299-00:00 0 [Note] [MY-012550] [InnoDB] Doing recovery: scanned up to log sequence number 21620080
2024-01-23T01:27:04.213080-00:00 0 [Note] [MY-013083] [InnoDB] Log background threads are being started...
2024-01-23T01:27:04.217845-00:00 0 [Note] [MY-012532] [InnoDB] Applying a batch of 0 redo log records ...
2024-01-23T01:27:04.217989-00:00 0 [Note] [MY-012535] [InnoDB] Apply batch completed!
2024-01-23T01:27:04.318445-00:00 0 [Note] [MY-013084] [InnoDB] Log background threads are being closed...
2024-01-23T01:27:04.321939-00:00 0 [Note] [MY-013888] [InnoDB] Upgrading redo log: 1032M, LSN=21620080.
2024-01-23T01:27:04.322330-00:00 0 [Note] [MY-012968] [InnoDB] Starting to delete and rewrite redo log files.
2024-01-23T01:27:04.322554-00:00 0 [Note] [MY-011825] [InnoDB] Removing redo log file: ./#innodb_redo/#ib_redo0
2024-01-23T01:27:04.412534-00:00 0 [Note] [MY-011825] [InnoDB] Creating redo log file at ./#innodb_redo/#ib_redo0_tmp with file_id 0 with size 33554432 bytes
2024-01-23T01:27:04.436851-00:00 0 [Note] [MY-011825] [InnoDB] Renaming redo log file from ./#innodb_redo/#ib_redo0_tmp to ./#innodb_redo/#ib_redo0
2024-01-23T01:27:04.442346-00:00 0 [Note] [MY-012893] [InnoDB] New redo log files created, LSN=21620236
2024-01-23T01:27:04.442445-00:00 0 [Note] [MY-013083] [InnoDB] Log background threads are being started...
2024-01-23T01:27:04.463041-00:00 0 [Note] [MY-013252] [InnoDB] Using undo tablespace './undo_001'.
2024-01-23T01:27:04.464508-00:00 0 [Note] [MY-013252] [InnoDB] Using undo tablespace './undo_002'.
2024-01-23T01:27:04.469845-00:00 0 [Note] [MY-012910] [InnoDB] Opened 2 existing undo tablespaces.
2024-01-23T01:27:04.469960-00:00 0 [Note] [MY-011980] [InnoDB] GTID recovery trx_no: 7714
2024-01-23T01:27:04.906260-00:00 0 [Note] [MY-013776] [InnoDB] Parallel initialization of rseg complete
2024-01-23T01:27:04.906310-00:00 0 [Note] [MY-013777] [InnoDB] Time taken to initialize rseg using 4 thread: 436360 ms.
2024-01-23T01:27:04.906442-00:00 0 [Note] [MY-012923] [InnoDB] Creating shared tablespace for temporary tables
2024-01-23T01:27:04.906569-00:00 0 [Note] [MY-012265] [InnoDB] Setting file './ibtmp1' size to 12 MB. Physically writing the file full; Please wait ...
2024-01-23T01:27:05.028732-00:00 0 [Note] [MY-012266] [InnoDB] File './ibtmp1' size is now 12 MB.
2024-01-23T01:27:05.051936-00:00 0 [Note] [MY-013627] [InnoDB] Scanning temp tablespace dir:'./#innodb_temp/'
2024-01-23T01:27:05.118267-00:00 0 [Note] [MY-013018] [InnoDB] Created 128 and tracked 128 new rollback segment(s) in the temporary tablespace. 128 are now active.
2024-01-23T01:27:05.118698-00:00 0 [Note] [MY-012976] [InnoDB] 8.0.35 started; log sequence number 21620246
2024-01-23T01:27:05.126878-00:00 0 [Warning] [MY-012091] [InnoDB] Allocated tablespace ID 1 for sys/sys_config, old maximum was 0
2024-01-23T01:27:05.173253-00:00 0 [Note] [MY-011825] [Xtrabackup] Completed loading of 16 tablespaces into cache in 0.0544669 seconds
2024-01-23T01:27:05.348046-00:00 0 [Note] [MY-011825] [Xtrabackup] Time taken to build dictionary: 0.174714 seconds
2024-01-23T01:27:05.349401-00:00 0 [Note] [MY-011825] [Xtrabackup] starting shutdown with innodb_fast_shutdown = 1
2024-01-23T01:27:05.349547-00:00 0 [Note] [MY-012330] [InnoDB] FTS optimize thread exiting.
2024-01-23T01:27:06.382728-00:00 0 [Note] [MY-013072] [InnoDB] Starting shutdown...
2024-01-23T01:27:06.492444-00:00 0 [Note] [MY-013084] [InnoDB] Log background threads are being closed...
2024-01-23T01:27:06.553396-00:00 0 [Note] [MY-012980] [InnoDB] Shutdown completed; log sequence number 21620246
2024-01-23T01:27:06.559388-00:00 0 [Note] [MY-011825] [Xtrabackup] completed OK!
adb@utez:~$
```

Paso 19: Luego de preparar, ahora siguiendo el comando xtrabackup, realizar la restauración de la base de datos desde la carpeta de respaldo al directorio original de mysql: `sudo xtrabackup --copy-back --target-dir=/home/adb/ruta/base --datadir=/var/lib/mysql`, al final nos tiene que dar **complete OK.**

```
3.sdi
2024-01-23T01:27:56.999780-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: Copying ./performance_schema/replication_grou_163.sdi to /var/lib/mysql/performance_schema/replication_g
rou_163.sdi
2024-01-23T01:27:57.002916-00:00 1 [Note] [MY-011825] [Xtrabackup] Copying ./performance_schema/socket_summary_b_148.sdi to /var/lib/mysql/performance_schema/socket_summary_b_14
8.sdi
2024-01-23T01:27:57.003125-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: Copying ./performance_schema/socket_summary_b_148.sdi to /var/lib/mysql/performance_schema/socket_summar
y_b_148.sdi
2024-01-23T01:27:57.006244-00:00 1 [Note] [MY-011825] [Xtrabackup] Copying ./performance_schema/events_transacti_138.sdi to /var/lib/mysql/performance_schema/events_transacti_13
8.sdi
2024-01-23T01:27:57.006405-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: Copying ./performance_schema/events_transacti_138.sdi to /var/lib/mysql/performance_schema/events_transa
cti_138.sdi
2024-01-23T01:27:57.009646-00:00 1 [Note] [MY-011825] [Xtrabackup] Copying ./performance_schema/rwlock_instances_101.sdi to /var/lib/mysql/performance_schema/rwlock_instances_10
1.sdi
2024-01-23T01:27:57.009883-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: Copying ./performance_schema/rwlock_instances_101.sdi to /var/lib/mysql/performance_schema/rwlock_instan
ces_101.sdi
2024-01-23T01:27:57.012760-00:00 1 [Note] [MY-011825] [Xtrabackup] Copying ./performance_schema/file_summary_by__94.sdi to /var/lib/mysql/performance_schema/file_summary_by__94.
sdi
2024-01-23T01:27:57.012924-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: Copying ./performance_schema/file_summary_by__94.sdi to /var/lib/mysql/performance_schema/file_summary_b
y__94.sdi
2024-01-23T01:27:57.016338-00:00 1 [Note] [MY-011825] [Xtrabackup] Copying ./performance_schema/variables_info_186.sdi to /var/lib/mysql/performance_schema/variables_info_186.sd
i
2024-01-23T01:27:57.016599-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: Copying ./performance_schema/variables_info_186.sdi to /var/lib/mysql/performance_schema/variables_info_
186.sdi
2024-01-23T01:27:57.019590-00:00 1 [Note] [MY-011825] [Xtrabackup] Copying ./performance_schema/table_lock_waits_109.sdi to /var/lib/mysql/performance_schema/table_lock_waits_10
9.sdi
2024-01-23T01:27:57.019891-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: Copying ./performance_schema/table_lock_waits_109.sdi to /var/lib/mysql/performance_schema/table_lock_wa
its_109.sdi
2024-01-23T01:27:57.024373-00:00 1 [Note] [MY-011825] [Xtrabackup] Copying ./ib_buffer_pool to /var/lib/mysql/ib_buffer_pool
2024-01-23T01:27:57.024440-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: Copying ./ib_buffer_pool to /var/lib/mysql/ib_buffer_pool
2024-01-23T01:27:57.026846-00:00 1 [Note] [MY-011825] [Xtrabackup] Copying ./xtrabackup_info to /var/lib/mysql/xtrabackup_info
2024-01-23T01:27:57.027020-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: Copying ./xtrabackup_info to /var/lib/mysql/xtrabackup_info
2024-01-23T01:27:57.029697-00:00 1 [Note] [MY-011825] [Xtrabackup] Creating directory ./#innodb_redo
2024-01-23T01:27:57.029759-00:00 1 [Note] [MY-011825] [Xtrabackup] Done: creating directory ./#innodb_redo
2024-01-23T01:27:57.161310-00:00 0 [Note] [MY-011825] [Xtrabackup] completed OK!
adb@utez:~$ sudo xtrabackup --copy-back --target-dir=/home/adb/ruta/base --datadir=/var/lib/mysql
```

Paso 20: Una vez que se restauró completamente, ahora devolver permisos de mysql con el siguiente comando: `sudo chown -R mysql:mysql /var/lib/mysql`, y verificar con **ls -la** la existencia de los archivos restaurados.

```
adb@utez:~$ sudo chown -R mysql:mysql /var/lib/mysql
adb@utez:~$ sudo ls -la /var/lib/mysql
total 84012
drwxr-x---  8 mysql mysql     4096 ene 23 01:27  .
drwxr-xr-x 45 root  root      4096 ene 23 01:27  ..
-rw-r-----  1 mysql mysql      157 ene 23 01:27  binlog.000015
-rw-r-----  1 mysql mysql       14 ene 23 01:27  binlog.index
-rw-r-----  1 mysql mysql        0 ene 23 01:27  ib_buffer_pool
-rw-r-----  1 mysql mysql 12582912 ene 23 01:27  ibdata1
-rw-r-----  1 mysql mysql 12582912 ene 23 01:27  ibtmp1
drwxr-x---  2 mysql mysql     4096 ene 23 01:27 '#innodb_redo'
drwxr-x---  2 mysql mysql     4096 ene 23 01:27  library
drwxr-x---  2 mysql mysql     4096 ene 23 01:27  mysql
-rw-r-----  1 mysql mysql 27262976 ene 23 01:27  mysql.ibd
drwxr-x---  2 mysql mysql     4096 ene 23 01:27  performance_schema
drwxr-x---  2 mysql mysql     4096 ene 23 01:27  sys
-rw-r-----  1 mysql mysql 16777216 ene 23 01:27  undo_001
-rw-r-----  1 mysql mysql 16777216 ene 23 01:27  undo_002
drwxr-x---  2 mysql mysql     4096 ene 23 01:27  veterinaria
-rw-r-----  1 mysql mysql      475 ene 23 01:27  xtrabackup_info
adb@utez:~$
```

Paso 21: Como el proceso de preparación y restauración lo hicimos deteniendo el servicio, ahora volveremos a activarlo para poder saber si se restauró correctamente.

```
adb@utez:~$ sudo service mysql start
adb@utez:~$ sudo service mysql status
● mysql.service - MySQL Community Server
     Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
     Active: active (running) since Tue 2024-01-23 01:30:34 UTC; 7s ago
    Process: 1467 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
   Main PID: 1475 (mysqld)
     Status: "Server is operational"
      Tasks: 38 (limit: 2220)
     Memory: 373.2M
        CPU: 3.710s
     CGroup: /system.slice/mysql.service
             └─1475 /usr/sbin/mysqld

ene 23 01:30:29 utez systemd[1]: Starting MySQL Community Server...
ene 23 01:30:34 utez systemd[1]: Started MySQL Community Server.
adb@utez:~$
```

Paso 22: Acceder nuevamente a la base de datos como en el **Paso 7 (admin, admin123)** y verificar las bases de datos con **show databases**;

```
adb@utez:~$ mysql -u admin -padmin123
mysql: [Warning] Using a password on the command line interface can be insecure.
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.35-0ubuntu0.22.04.1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| library            |
| mysql              |
| performance_schema |
| sys                |
| veterinaria        |
+--------------------+
6 rows in set (0,01 sec)

mysql>
```

Paso 23: Usar la base de datos y verificar con **select * from** a cualquier tabla (en este caso clients) para determinar si se guardaron los cambios correspondientes. Efectivamente se guardaron los cambios.

```
mysql> use veterinaria;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> select * from clients;
+----+--------+-----------+---------------------+
| id | name   | last_name | created_at          |
+----+--------+-----------+---------------------+
|  1 | John   | Doe       | 2024-01-19 22:32:13 |
|  2 | Jane   | Doe       | 2024-01-19 22:32:13 |
|  3 | John   | Smith     | 2024-01-19 22:32:13 |
|  4 | Jane   | Smith     | 2024-01-19 22:32:13 |
|  5 | John   | Johnson   | 2024-01-19 22:32:13 |
|  6 | Jane   | Johnson   | 2024-01-19 22:32:13 |
|  7 | John   | Williams  | 2024-01-19 22:32:13 |
|  8 | Jane   | Williams  | 2024-01-19 22:32:13 |
|  9 | John   | Brown     | 2024-01-19 22:32:13 |
| 10 | Jane   | Brown     | 2024-01-19 22:32:13 |
| 11 | Kayne  | West      | 2024-01-19 22:43:37 |
| 12 | Taylor | Swift     | 2024-01-19 22:43:37 |
| 13 | Abel   | Tesfaye   | 2024-01-19 22:43:37 |
+----+--------+-----------+---------------------+
13 rows in set (0,03 sec)

mysql>
```

Paso 24: Ahora procederemos a guardar los datos en el repositorio de Github creado en el **Paso 1**, donde con comando **git init** inicializamos los cambios realizados. Así mismo también crearemos un archivo **README.md** para escribir un texto a través del comando **nano** y con **git status** checamos que archivos se van a subir al repositorio.

```
adb@utez:~$ git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint:   git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint:   git branch -m <name>
Initialized empty Git repository in /home/adb/.git/
adb@utez:~$ git add README.md
fatal: pathspec 'README.md' did not match any files
adb@utez:~$ sudo nano README.md
adb@utez:~$ git status
warning: could not open directory 'ruta/base/veterinaria/': Permission denied
warning: could not open directory 'ruta/base/sys/': Permission denied
On branch master

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        .bash_history
        .bash_logout
        .bashrc
        .cache/
        .mysql_history
        .profile
        .ssh/
        .sudo_as_admin_successful
        README.md
        ruta/
        script/

nothing added to commit but untracked files present (use "git add" to track)
adb@utez:~$
```

Paso 25: Ahora con comando **git add .** subiremos los cambios realizados. Así mismo también con el comando **git status** checamos que archivos están preparados para subir al repositorio. (Acompañado del sudo para establecer permisos de administrador).

```
adb@utez:~$ git add .
warning: could not open directory 'ruta/base/veterinaria/': Permission denied
warning: could not open directory 'ruta/base/sys/': Permission denied
warning: could not open directory 'ruta/base/library/': Permission denied
warning: could not open directory 'ruta/base/mysql/': Permission denied
warning: could not open directory 'ruta/base/performance_schema/': Permission d
warning: could not open directory 'ruta/base/#innodb_redo/': Permission denied
error: open("ruta/base/backup-my.cnf"): Permission denied
error: unable to index file 'ruta/base/backup-my.cnf'
fatal: adding files failed
adb@utez:~$ sudo git add .
adb@utez:~$ git status
ruta/base/library/authors.ibd: Permission denied
ruta/base/library/books.ibd: Permission denied
ruta/base/library/books_authors.ibd: Permission denied
ruta/base/library/books_categories.ibd: Permission denied
ruta/base/library/books_publishers.ibd: Permission denied
ruta/base/library/categories.ibd: Permission denied
ruta/base/library/loans.ibd: Permission denied
ruta/base/library/publishers.ibd: Permission denied
ruta/base/library/users.ibd: Permission denied
ruta/base/mysql/general_log.CSM: Permission denied
ruta/base/mysql/general_log.CSV: Permission denied
ruta/base/mysql/general_log_213.sdi: Permission denied
ruta/base/mysql/slow_log.CSM: Permission denied
ruta/base/mysql/slow_log.CSV: Permission denied
ruta/base/mysql/slow_log_214.sdi: Permission denied
ruta/base/performance_schema/accounts_145.sdi: Permission denied
ruta/base/performance_schema/binary_log_trans_189.sdi: Permission denied
ruta/base/performance_schema/cond_instances_82.sdi: Permission denied
ruta/base/performance_schema/data_lock_waits_161.sdi: Permission denied
ruta/base/performance_schema/data_locks_160.sdi: Permission denied
ruta/base/performance_schema/error_log_83.sdi: Permission denied
ruta/base/performance_schema/events_errors_su_139.sdi: Permission denied
ruta/base/performance_schema/events_errors_su_140.sdi: Permission denied
ruta/base/performance_schema/events_errors_su_141.sdi: Permission denied
ruta/base/performance_schema/events_errors_su_142.sdi: Permission denied
ruta/base/performance_schema/events_errors_su_143.sdi: Permission denied
ruta/base/performance_schema/events_stages_cu_111.sdi: Permission denied
ruta/base/performance_schema/events_stages_hi_112.sdi: Permission denied
ruta/base/performance_schema/events_stages_hi_113.sdi: Permission denied
ruta/base/performance_schema/events_stages_su_114.sdi: Permission denied
ruta/base/performance_schema/events_stages_su_115.sdi: Permission denied
ruta/base/performance_schema/events_stages_su_116.sdi: Permission denied
ruta/base/performance_schema/events_stages_su_117.sdi: Permission denied
ruta/base/performance_schema/events_stages_su_118.sdi: Permission denied
ruta/base/performance_schema/events_statement_119.sdi: Permission denied
ruta/base/performance_schema/events_statement_120.sdi: Permission denied
ruta/base/performance_schema/events_statement_121.sdi: Permission denied
ruta/base/performance_schema/events_statement_122.sdi: Permission denied
ruta/base/performance_schema/events_statement_123.sdi: Permission denied
ruta/base/performance_schema/events_statement_124.sdi: Permission denied
```

```
        new file:   ruta/base/performance_schema/replication_appl_171.sdi
        new file:   ruta/base/performance_schema/replication_asyn_172.sdi
        new file:   ruta/base/performance_schema/replication_asyn_173.sdi
        new file:   ruta/base/performance_schema/replication_conn_162.sdi
        new file:   ruta/base/performance_schema/replication_conn_164.sdi
        new file:   ruta/base/performance_schema/replication_grou_163.sdi
        new file:   ruta/base/performance_schema/replication_grou_169.sdi
        new file:   ruta/base/performance_schema/rwlock_instances_101.sdi
        new file:   ruta/base/performance_schema/session_account__151.sdi
        new file:   ruta/base/performance_schema/session_connect__150.sdi
        new file:   ruta/base/performance_schema/session_status_182.sdi
        new file:   ruta/base/performance_schema/session_variable_185.sdi
        new file:   ruta/base/performance_schema/setup_actors_102.sdi
        new file:   ruta/base/performance_schema/setup_consumers_103.sdi
        new file:   ruta/base/performance_schema/setup_instrument_104.sdi
        new file:   ruta/base/performance_schema/setup_objects_105.sdi
        new file:   ruta/base/performance_schema/setup_threads_106.sdi
        new file:   ruta/base/performance_schema/socket_instances_147.sdi
        new file:   ruta/base/performance_schema/socket_summary_b_148.sdi
        new file:   ruta/base/performance_schema/socket_summary_b_149.sdi
        new file:   ruta/base/performance_schema/status_by_accoun_177.sdi
        new file:   ruta/base/performance_schema/status_by_host_178.sdi
        new file:   ruta/base/performance_schema/status_by_thread_179.sdi
        new file:   ruta/base/performance_schema/status_by_user_180.sdi
        new file:   ruta/base/performance_schema/table_handles_158.sdi
        new file:   ruta/base/performance_schema/table_io_waits_s_107.sdi
        new file:   ruta/base/performance_schema/table_io_waits_s_108.sdi
        new file:   ruta/base/performance_schema/table_lock_waits_109.sdi
        new file:   ruta/base/performance_schema/threads_110.sdi
        new file:   ruta/base/performance_schema/tls_channel_stat_190.sdi
        new file:   ruta/base/performance_schema/user_defined_fun_188.sdi
        new file:   ruta/base/performance_schema/user_variables_b_176.sdi
        new file:   ruta/base/performance_schema/users_144.sdi
        new file:   ruta/base/performance_schema/variables_by_thr_183.sdi
        new file:   ruta/base/performance_schema/variables_info_186.sdi
        new file:   ruta/base/sys/sys_config.ibd
        new file:   ruta/base/undo_001
        new file:   ruta/base/undo_002
        new file:   ruta/base/veterinaria/appointments.ibd
        new file:   ruta/base/veterinaria/appointments_vets.ibd
        new file:   ruta/base/veterinaria/clients.ibd
        new file:   ruta/base/veterinaria/pets.ibd
        new file:   ruta/base/veterinaria/vets.ibd
        new file:   ruta/base/xtrabackup_binlog_info
        new file:   ruta/base/xtrabackup_checkpoints
        new file:   ruta/base/xtrabackup_info
        new file:   ruta/base/xtrabackup_logfile
        new file:   ruta/base/xtrabackup_tablespaces
        new file:   script/Veterinaria.sql

adb@utez:~$
```

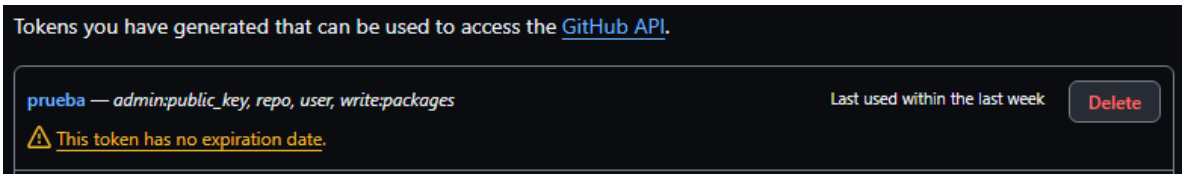
Paso 26: Posteriormente con comando **git config —global** configuraremos los usuarios de Github (nombre y correo) para poder subir los cambios. Así mismo también con el comando **git commit -m** establecemos un mensaje para identificar los cambios preparados para subir al repositorio. (Acompañado del sudo para establecer permisos de administrador).

```
adb@utez:~$ sudo git commit -m "first commit de copia completa"
Author identity unknown

*** Please tell me who you are.

Run

  git config --global user.email "you@example.com"
  git config --global user.name "Your Name"

to set your account's default identity.
Omit --global to set the identity only in this repository.

fatal: unable to auto-detect email address (got 'root@utez.(none)')
adb@utez:~$ sudo git config --global user.email "20213tn002@utez.edu.mx"
adb@utez:~$ sudo git config --global user.name "LuisVad"
adb@utez:~$ sudo git commit -m "first commit de copia completa"
[master (root-commit) d498697] first commit de copia completa
 155 files changed, 606 insertions(+)
 create mode 100644 .bash_history
 create mode 100644 .bash_logout
 create mode 100644 .bashrc
 create mode 100644 .cache/motd.legal-displayed
 create mode 100644 .mysql_history
 create mode 100644 .profile
 create mode 100644 .ssh/authorized_keys
 create mode 100644 .sudo_as_admin_successful
 create mode 100644 README.md
 create mode 100644 ruta/base/backup-my.cnf
 create mode 100644 ruta/base/binlog.000015
 create mode 100644 ruta/base/binlog.index
 create mode 100644 ruta/base/ib_buffer_pool
 create mode 100644 ruta/base/ibdata1
 create mode 100644 ruta/base/ibtmp1
 create mode 100644 ruta/base/library/authors.ibd
 create mode 100644 ruta/base/library/books.ibd
 create mode 100644 ruta/base/library/books_authors.ibd
 create mode 100644 ruta/base/library/books_categories.ibd
 create mode 100644 ruta/base/library/books_publishers.ibd
 create mode 100644 ruta/base/library/categories.ibd
```

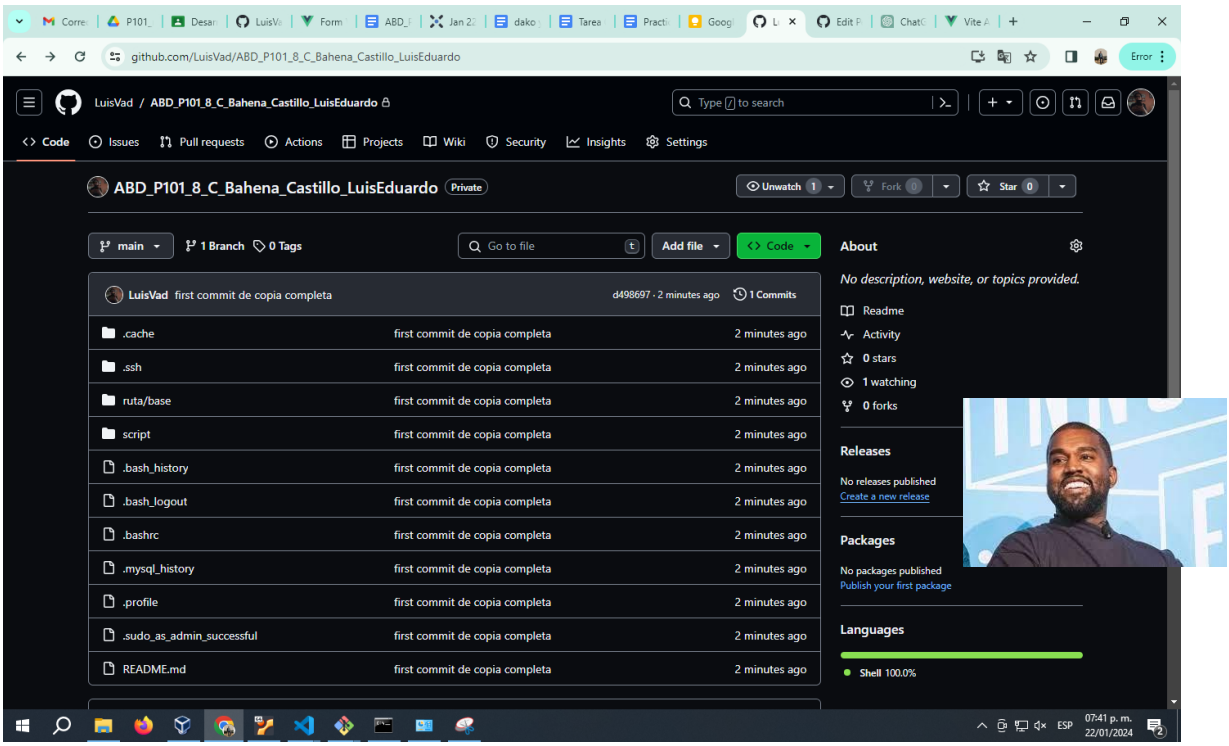
```
create mode 100644 ruta/base/performance_schema/replication_asyn_172.sdi
create mode 100644 ruta/base/performance_schema/replication_asyn_173.sdi
create mode 100644 ruta/base/performance_schema/replication_conn_162.sdi
create mode 100644 ruta/base/performance_schema/replication_conn_164.sdi
create mode 100644 ruta/base/performance_schema/replication_grou_163.sdi
create mode 100644 ruta/base/performance_schema/replication_grou_169.sdi
create mode 100644 ruta/base/performance_schema/rwlock_instances_101.sdi
create mode 100644 ruta/base/performance_schema/session_account__151.sdi
create mode 100644 ruta/base/performance_schema/session_connect__150.sdi
create mode 100644 ruta/base/performance_schema/session_status_182.sdi
create mode 100644 ruta/base/performance_schema/session_variable_185.sdi
create mode 100644 ruta/base/performance_schema/setup_actors_102.sdi
create mode 100644 ruta/base/performance_schema/setup_consumers_103.sdi
create mode 100644 ruta/base/performance_schema/setup_instrument_104.sdi
create mode 100644 ruta/base/performance_schema/setup_objects_105.sdi
create mode 100644 ruta/base/performance_schema/setup_threads_106.sdi
create mode 100644 ruta/base/performance_schema/socket_instances_147.sdi
create mode 100644 ruta/base/performance_schema/socket_summary_b_148.sdi
create mode 100644 ruta/base/performance_schema/socket_summary_b_149.sdi
create mode 100644 ruta/base/performance_schema/status_by_accoun_177.sdi
create mode 100644 ruta/base/performance_schema/status_by_host_178.sdi
create mode 100644 ruta/base/performance_schema/status_by_thread_179.sdi
create mode 100644 ruta/base/performance_schema/status_by_user_180.sdi
create mode 100644 ruta/base/performance_schema/table_handles_158.sdi
create mode 100644 ruta/base/performance_schema/table_io_waits_s_107.sdi
create mode 100644 ruta/base/performance_schema/table_io_waits_s_108.sdi
create mode 100644 ruta/base/performance_schema/table_lock_waits_109.sdi
create mode 100644 ruta/base/performance_schema/threads_110.sdi
create mode 100644 ruta/base/performance_schema/tls_channel_stat_190.sdi
create mode 100644 ruta/base/performance_schema/user_defined_fun_188.sdi
create mode 100644 ruta/base/performance_schema/user_variables_b_176.sdi
create mode 100644 ruta/base/performance_schema/users_144.sdi
create mode 100644 ruta/base/performance_schema/variables_by_thr_183.sdi
create mode 100644 ruta/base/performance_schema/variables_info_186.sdi
create mode 100644 ruta/base/sys/sys_config.ibd
create mode 100644 ruta/base/undo_001
create mode 100644 ruta/base/undo_002
create mode 100644 ruta/base/veterinaria/appointments.ibd
create mode 100644 ruta/base/veterinaria/appointments_vets.ibd
create mode 100644 ruta/base/veterinaria/clients.ibd
create mode 100644 ruta/base/veterinaria/pets.ibd
create mode 100644 ruta/base/veterinaria/vets.ibd
create mode 100644 ruta/base/xtrabackup_binlog_info
create mode 100644 ruta/base/xtrabackup_checkpoints
create mode 100644 ruta/base/xtrabackup_info
create mode 100644 ruta/base/xtrabackup_logfile
create mode 100644 ruta/base/xtrabackup_tablespaces
create mode 100644 script/Veterinaria.sql
adb@utez:~$
```

Paso 27: Con el comando git branch (Acompañado del sudo para establecer permisos de administrador), ubicamos la rama en el cual se van a subir los cambios, y con git remote add origin buscaremos en el repositorio a subir los cambios (en esta caso ponemos la dirección del repositorio que creamos). Y finalmente con git push -u origin main empujamos todos los cambios y se suben al repositorio. (Nos pedira ingresar el usuario y un token para poder subir los cambios correspondientes, el token es generado por Github en la sección de token classic).

```
adb@utez:~$ sudo git branch -M main
adb@utez:~$ sudo git remote add origin https://github.com/LuisVad/ABD_P101_8_C_Bahena_Castillo_LuisEduardo.git
adb@utez:~$ sudo git push -u origin main
Username for 'https://github.com': LuisVad
Password for 'https://LuisVad@github.com':
Enumerating objects: 161, done.
Counting objects: 100% (161/161), done.
Delta compression using up to 4 threads
Compressing objects: 100% (151/151), done.
Writing objects: 100% (161/161), 1.73 MiB | 457.00 KiB/s, done.
Total 161 (delta 122), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (122/122), done.
To https://github.com/LuisVad/ABD_P101_8_C_Bahena_Castillo_LuisEduardo.git
 * [new branch]      main -> main
Branch 'main' set up to track remote branch 'main' from 'origin'.
adb@utez:~$
```



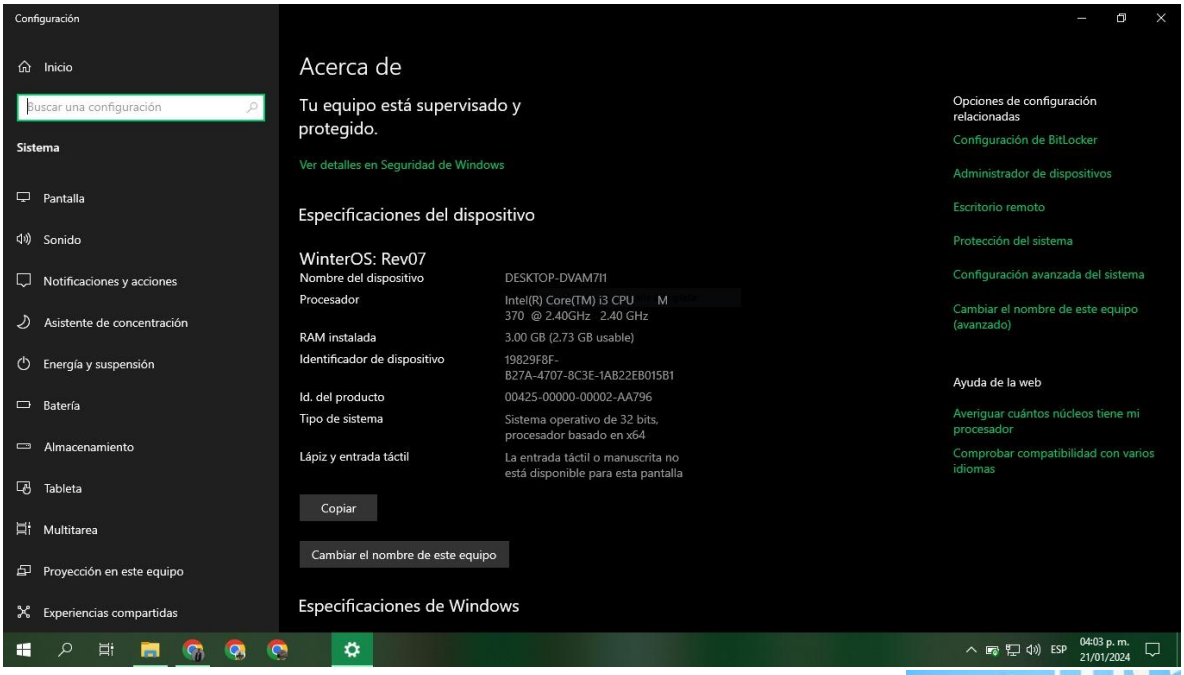
Finalmente observamos los cambios en el repositorio de Github.



CONCLUSIÓN

La práctica de restauración de una copia de seguridad de una base de datos es fundamental para garantizar la integridad y disponibilidad de la información. Este proceso no solo proporciona una medida de seguridad ante posibles pérdidas de datos, ya sea por errores humanos o fallos del sistema, sino que también asegura la continuidad operativa de la organización al permitir la recuperación rápida y eficiente de la información crítica. La implementación regular y exitosa de estas restauraciones es esencial para mantener la confianza en la gestión de datos y salvaguardar la estabilidad de los sistemas de información.

En esta práctica se me implementaron varios desafíos al poder realizar la ejecución de las copias de seguridad, puesto que mi laptop no soporta la versión de 64 bits y por ende, no pude ejecutar la máquina virtual asignado en el classroom, sin embargo no me quede de brazos cruzados y me hice una maquina virtual de 32 bits de Ubuntu, y por si fuera poco, no ejecutó bien, ya que la versión de MySQL es de 5.0 y no de 8.0, lo que no permite la compatibilidad con Xtrabackup.



```
Ubuntu 16.04.6 LTS luisvad tty1

luisvad login: adb
Password:
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.4.0-142-generic i686)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

Pueden actualizarse 196 paquetes.
138 actualizaciones son de seguridad.



The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.


The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

adb@luisvad:~$ _
```

```
adb@luisvad:~/script$ sudo -i
root@luisvad:~# cd ..
root@luisvad:/# sudo xtrabackup --backup --target-dir=/ruta/base
Unrecognized character \x01; marked by <-- HERE after <-- HERE near column 1 at - line 1374.
240120 22:24:26 Connecting to MySQL server host: localhost, user: not set, password: not set, port:
not set, socket: not set
Failed to connect to MySQL server: Access denied for user 'root'@'localhost' (using password: NO).
root@luisvad:/# ls
bin   dev  home        lib         media  opt   root  sbin  srv  tmp  var
boot  etc  initrd.img  lost+found  mnt    proc  run   snap  sys  usr  vmlinuz
root@luisvad:/# mkdir /ruta/base
mkdir: no se puede crear el directorio «/ruta/base»: No existe el archivo o el directorio
root@luisvad:/# mkdir ruta/base
mkdir: no se puede crear el directorio «ruta/base»: No existe el archivo o el directorio
root@luisvad:/# mkdir ruta
root@luisvad:/# mkdir ruta/base
root@luisvad:/# ls
bin   dev  home        lib         media  opt   root  ruta  snap  sys  usr  vmlinuz
boot  etc  initrd.img  lost+found  mnt    proc  run   sbin  srv   tmp  var
root@luisvad:/# sudo xtrabackup --backup --target-dir=/ruta/base
Unrecognized character \x01; marked by <-- HERE after <-- HERE near column 1 at - line 1374.
240120 22:26:01 Connecting to MySQL server host: localhost, user: not set, password: not set, port:
not set, socket: not set
Failed to connect to MySQL server: Access denied for user 'root'@'localhost' (using password: NO).
root@luisvad:/# sudo xtrabackup --backup --user=root --password=root --target-dir=/ruta/base
Unrecognized character \x01; marked by <-- HERE after <-- HERE near column 1 at - line 1374.
240120 22:26:27 Connecting to MySQL server host: localhost, user: root, password: set, port: not set
, socket: not set
Error: Unsupported server version: '5.7.33-0ubuntu0.16.04.1'. Please report a bug at https://bugs.la
unchpad.net/percona-xtrabackup
root@luisvad:/# ls
bin   dev  home        lib         media  opt   root  ruta  snap  sys  usr  vmlinuz
boot  etc  initrd.img  lost+found  mnt    proc  run   sbin  srv   tmp  var
root@luisvad:/# _
```