**Task 4 - Database Backup and Recovery**

This report explains the process of creating a backup and restoring a MySQL database as part of Task 4 in the CODTECH internship. The goal of this task is to demonstrate how data can be safely backed up and then recovered in case of accidental loss, failure, or deletion. Understanding how to perform database backups and recovery is an essential skill for any developer or database administrator.

The database used for this task was named 'task2\_analysis', which was previously created during Task 2. This database contained two tables: Employees and Sales. These tables were populated with sample data and were used for analysis and queries. For this task, I needed to export this entire database into a backup file and then restore it using command-line tools.

The first step involved locating the MySQL bin directory, which contains the necessary executables to perform backup and restore operations. On my system, the path was: C:\Program Files\MySQL\MySQL Server 8.0\bin. This is where the 'mysqldump' and 'mysql' commands are located.

I then opened the Command Prompt and navigated to the MySQL bin directory. Once inside the correct directory, I ran the 'mysqldump' command to export the database. I specified the database name, username, and output path. To avoid permission errors, I created a folder inside my user directory called 'mysql\_backup'. The final command used was:

mysqldump -u root -p task2\_analysis > "C:\Users\Bhumika S\mysql\_backup\task2\_backup.sql"

This command generated a complete backup of the database and saved it to a .sql file on my system. After this file was created, I proceeded to simulate a failure. This involved dropping the database using MySQL Workbench by running the command: DROP DATABASE task2\_analysis. This step is not mandatory but helps demonstrate the recovery process.

To restore the backup, I opened the Command Prompt again, accessed the MySQL client using the command 'mysql -u root -p', and created a fresh empty database using: CREATE DATABASE task2\_analysis. After exiting the MySQL prompt, I ran the restore command to import the data from the backup file:

mysql -u root -p task2\_analysis < "C:\Users\Bhumika S\mysql\_backup\task2\_backup.sql"

This command restored all the tables and data from the backup file back into the MySQL server. I confirmed the recovery by opening MySQL Workbench and checking that the database, tables, and records were exactly the same as before. This validated that the backup and restore process worked correctly.

Through this task, I gained practical knowledge of how to safely export a database and restore it using command-line tools. This is a very important aspect of database management, especially in real-world scenarios where system crashes or accidental deletions can happen at any time. By knowing how to recover data quickly, we can ensure that critical information is never permanently lost.

In conclusion, Task 4 helped me understand the real importance of backups and how to implement them. I now feel confident in using 'mysqldump' and 'mysql' commands for managing data backups and recovery. This experience was valuable and closely mirrors how real database administrators work in production environments.