

Cyber Forensics and Laws

Mini Project

Aim: Write a program to take backup of a MySQL database.

Used software:

- Python 3.10.5 (64 bit)
- XAMPP 3.3.0 (64 bit)
 - Apache 2.4.53 (64 bit)
 - MariaDB 10.2.24 (based on MySQL 15.1) (64 bit)
 - PHP 8.1.6 (64 bit)
 - phpMyAdmin 5.2.0
- Chromium 103.0.5060.114 (64 bit)

Note: Apache and PHP are internal dependencies for running phpMyAdmin and are not explicitly used in this exercise.

Description:

- **Backup:** In [information technology](#), a **backup**, or **data backup** is a copy of [computer data](#) taken and stored elsewhere so that it may be used to restore the original after a [data loss](#) event. Backups can be used to recover data after its loss from [data deletion](#) or [corruption](#), or to recover data from an earlier time.
- **Database:** In [computing](#), a **database** is an organized collection of [data](#) stored and accessed electronically. Small databases can be

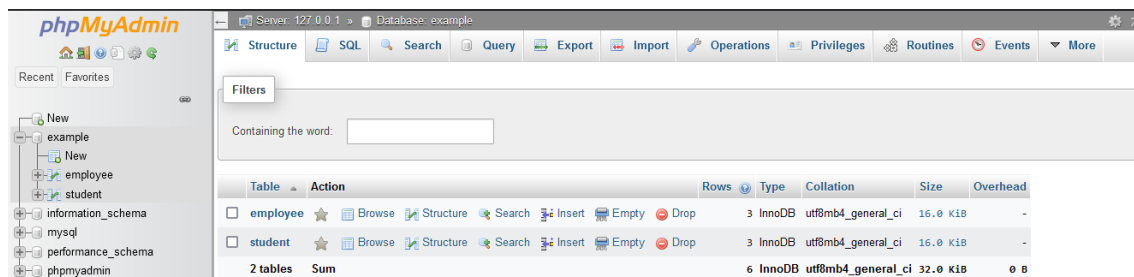
stored on a [file system](#), while large databases are hosted on [computer clusters](#) or [cloud storage](#).

- **Relational Database:** A **relational database** is a (most commonly digital) [database](#) based on the [relational model](#) of data. A relational model organizes data into one or more [tables](#) (or "relations") of [columns](#) and [rows](#), with a unique key identifying each row. Rows are also called [records](#) or [tuples](#). Columns are also called attributes. Generally, each table/relation represents one "entity type" (such as customer or product). The rows represent instances of that type of entity (such as "Lee" or "chair") and the columns representing values attributed to that instance (such as address or price).
- **Python:** **Python** is a [high-level](#), [interpreted](#), [general-purpose programming language](#). Its design philosophy emphasizes [code readability](#) with the use of [significant indentation](#). Python is [dynamically-typed](#) and [garbage-collected](#). It supports multiple [programming paradigms](#), including [structured](#) (particularly [procedural](#)), [object-oriented](#) and [functional programming](#). It is often described as a "batteries included" language due to its comprehensive [standard library](#).
- **MySQL:** **MySQL** is an [open-source relational database management system](#) (RDBMS). Its name is a combination of "My", the name of co-founder [Michael Widenius](#)'s daughter, and "SQL", the abbreviation for [Structured Query Language](#). MySQL is [free and open-source software](#) under the terms of the [GNU General Public License](#), and is also available under a variety of [proprietary](#) licenses.
- **MariaDB:** **MariaDB** is a community-developed, commercially supported [fork](#) of the [MySQL relational database management system](#) (RDBMS), intended to remain [free and open-source software](#) under the [GNU General Public License](#). Development is led by some of the original developers of MySQL, who forked it due to concerns over its [acquisition](#) by [Oracle Corporation](#) in 2009.
- **XAMPP:** **XAMPP** is a [free and open-source cross-platform web server solution stack](#) package developed by Apache Friends,

consisting mainly of the [Apache HTTP Server](#), [MariaDB database](#), and [interpreters](#) for scripts written in the [PHP](#) and [Perl programming languages](#). Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server possible.

Database structure and contents:

- **Name:** *example*



The screenshot shows the phpMyAdmin interface for a database named 'example'. The left sidebar shows a tree view with 'example' selected, containing 'employee' and 'student' tables. The main panel shows the 'Structure' tab with a table list:

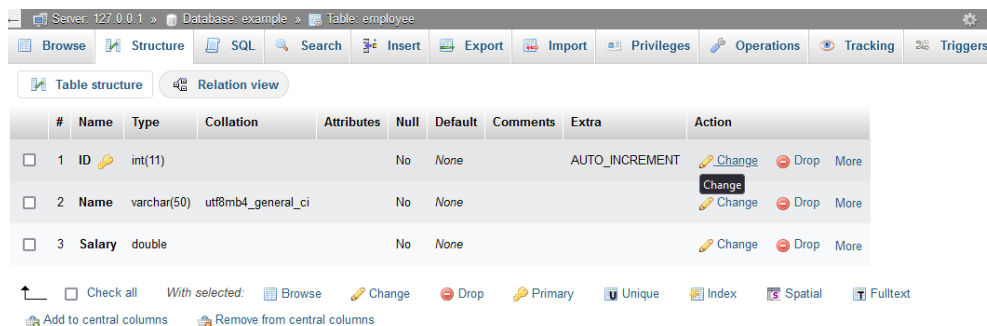
Table	Action	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> employee	Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_general_ci	16.0 KiB	-
<input type="checkbox"/> student	Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_general_ci	16.0 KiB	-
2 tables Sum		6	InnoDB	utf8mb4_general_ci	32.0 KiB	0 B

- **Database contents:**

- **Tables:**

- *employee*

- **Structure:**



The screenshot shows the 'Table structure' view for the 'employee' table. The table has three columns:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	ID	int(11)			No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/> 2	Name	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 3	Salary	double			No	None			Change Drop More

At the bottom, there are options to 'Check all', 'With selected', 'Browse', 'Change', 'Drop', 'Primary', 'Unique', 'Index', 'Spatial', and 'Fulltext'. There are also buttons to 'Add to central columns' and 'Remove from central columns'.

- **Contents:**

Server: 127.0.0.1 > Database: example > Table: employee

Showing rows 0 - 2 (3 total, Query took 0.0017 seconds.)

```
SELECT * FROM `employee`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Extra options

	ID	Name	Salary
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	101	John Doe	20413.34
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	102	Lex Lucifer	133435.03
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	103	Hercules Olympian	34235.98

Check all | With selected: Edit Copy Delete Export

▪ student

• Structure:

Server: 127.0.0.1 > Database: example > Table: student

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	ID	int(11)			No	None		AUTO_INCREMENT	<input type="checkbox"/> Change <input type="checkbox"/> Drop <input type="checkbox"/> More
<input type="checkbox"/> 2	Full Name	varchar(50)	utf8mb4_general_ci		No	None			<input type="checkbox"/> Change <input type="checkbox"/> Drop <input type="checkbox"/> More
<input type="checkbox"/> 3	Grade	varchar(3)	utf8mb4_general_ci		No	None			<input type="checkbox"/> Change <input type="checkbox"/> Drop <input type="checkbox"/> More
<input type="checkbox"/> 4	Division	varchar(1)	utf8mb4_general_ci		No	None			<input type="checkbox"/> Change <input type="checkbox"/> Drop <input type="checkbox"/> More

Check all | With selected: Browse Change Drop Primary Unique Index Spatial Fulltext

Add to central columns Remove from central columns

• Contents:

Server: 127.0.0.1 > Database: example > Table: student

Showing rows 0 - 2 (3 total, Query took 0.0010 seconds.)

```
SELECT * FROM `student`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Extra options

	ID	Full Name	Grade	Division
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	101	Orion Bowser	11	B
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	102	Heracles Olympia	9	F
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	103	Shankar Adhishakti	7	C

Check all | With selected: Edit Copy Delete Export

Program:

```
import mysql.connector as connector
from sys import exit

if __name__ == "__main__":
    hostname = input("Enter host name [localhost]>")
    hostname = hostname if hostname != "" else "localhost"
    username = input("Enter your username > ")
    if username == "":
        exit("Please input the correct username")
    print("If password is not set, just press [Enter] on the
following prompt")
    password = input("Enter your password > ")
    database_name = input("Enter the name of the database you want
to backup > ")
    if database_name == "":
        exit("Please input the correct database name")

    print("Trying connection...")
    try:
        connection = connector.connect(host = hostname, user =
username, password = password, database = database_name)
        cursor = connection.cursor()
        print("Connection successful")

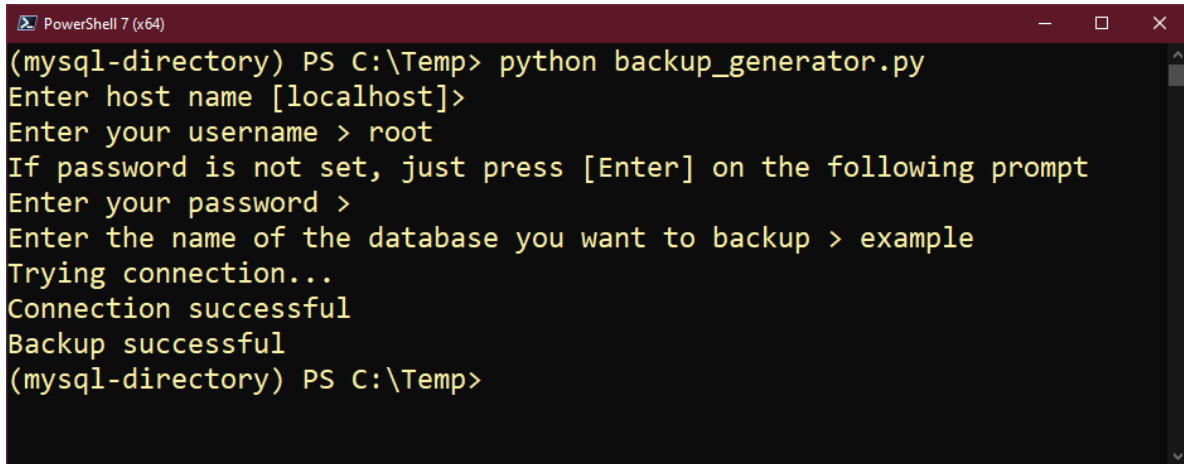
        cursor.execute("show tables;")
        table_names : list[str] = []
        for record in cursor.fetchall():
            table_names.append(record[0])

        backup_database_name = database_name + "_backup"
        cursor.execute(f"create database
{backup_database_name};")
        cursor.execute(f"use {backup_database_name};")

        for table_name in table_names:
            cursor.execute(f"create table {table_name} select *
from {database_name}.{table_name}")
        print("Backup successful")
```

```
except:  
    exit("Connection unsuccessful")
```

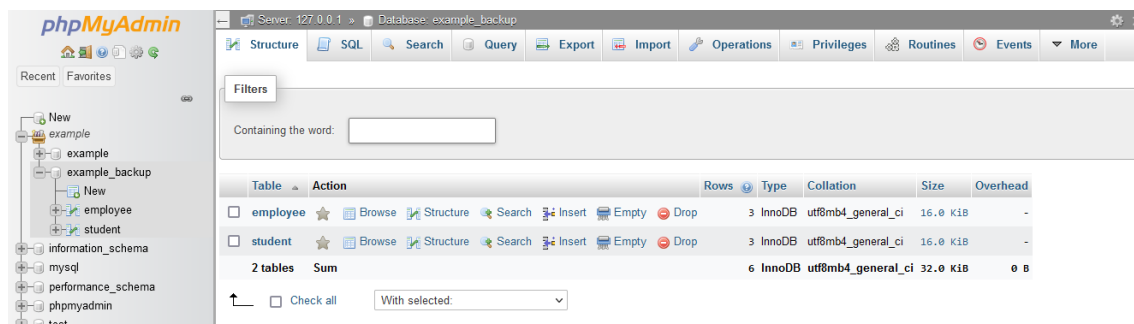
Output:



```
(mysql-directory) PS C:\Temp> python backup_generator.py  
Enter host name [localhost]>  
Enter your username > root  
If password is not set, just press [Enter] on the following prompt  
Enter your password >  
Enter the name of the database you want to backup > example  
Trying connection...  
Connection successful  
Backup successful  
(mysql-directory) PS C:\Temp>
```

Database structure and contents:

- **Name:** *example_backup*



- **Database contents:**

- **Tables:**

- *employee*

- **Structure:**

Server: 127.0.0.1 > Database: example_backup > Table: employee

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	ID	int(11)			No	0			Change Drop More
2	Name	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More
3	Salary	double			No	None			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Spatial Fulltext

Add to central columns Remove from central columns

• Contents:

Server: 127.0.0.1 > Database: example_backup > Table: employee

Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.

Showing rows 0 - 2 (3 total, Query took 0.0009 seconds)

SELECT * FROM `employee`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all Number of rows: 25 Filter rows: Search this table

Extra options

ID	Name	Salary
101	John Doe	20413.34
102	Lex Lucifer	133435.03
103	Hercules Olympian	34235.98

Show all Number of rows: 25 Filter rows: Search this table

▪ student

• Structure:

Server: 127.0.0.1 > Database: example_backup > Table: student

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	ID	int(11)			No	0			Change Drop More
2	Full Name	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More
3	Grade	varchar(3)	utf8mb4_general_ci		No	None			Change Drop More
4	Division	varchar(1)	utf8mb4_general_ci		No	None			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Spatial Fulltext

Add to central columns Remove from central columns

• Contents:

Browse

Structure

SQL

Search

Insert

Export

Import

Privileges

Operations

Tracking

Triggers

⚠

Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.

🔗

✔

Showing rows 0 - 2 (3 total, Query took 0.0009 seconds.)

SELECT * FROM `student`

☐ Profiling

[\[Edit inline \]](#)

[\[Edit \]](#)

[\[Explain SQL \]](#)

[\[Create PHP code \]](#)

[\[Refresh \]](#)

☐ Show all

Number of rows: 25

Filter rows:

Extra options

ID	Full Name	Grade	Division
101	Orion Bowser	11	B
102	Heracles Olympia	9	F
103	Shankar Adhishakti	7	C

☐ Show all

Number of rows: 25

Filter rows: