Introduction

This Python program serves as a Command-Line Interface (CLI) software system for managing a database, specifically for teachers and students in an educational institution. The code establishes a connection to a MySQL database, utilizes text-to-speech capabilities for interaction, and provides a menu-driven interface for various database operations.

Database Connection

The program establishes a connection to a MySQL database using the `mysql.connector` library and creates an SQLAlchemy engine for database interaction.

Text-to-Speech

To enhance user interaction, the code employs the `pyttsx3` library to provide text-to-speech functionality. It initializes a speech engine, selects a voice, and delivers spoken feedback.

Password Authentication

The software begins by requesting a password from the user. To gain access, the user must input a password that matches the current time (in the format HHMM).

Menu System

The program utilizes a menu-driven system to facilitate user interaction. It presents options to manage both teachers and students, as well as an option to exit the program.

Teacher Management

Within the "Teachers" menu, the following functionalities are available:

- View Teacher Details : This option retrieves and displays teacher information stored in the database.

- Add Teacher : Users can input information about a new teacher, which is then inserted into the database.
- Update Teacher : This option provides the flexibility to update a teacher's name, salary, or both.
- Remove Teacher : Users can choose to remove a teacher from the database.
- Salary Structure : This option displays information related to teachers' salaries.
- Export Teachers Data to CSV : Teacher data can be exported to a CSV file.

Student Management

Within the "Students" menu, users can perform the following actions:

- View Student Details : This option retrieves and displays student information stored in the database.
- Add Student : Users can input information about a new student, which is then inserted into the database.
- Update Student : This option provides the flexibility to update a student's name, class, or both.
- Remove Student : Users can choose to remove a student from the database.
- Fees Structure : This option displays information related to student fees.
- Export Students Data to CSV : Student data can be exported to a CSV file.

Exiting the Program

Users can choose the "Exit" option to exit the program gracefully. The `sys.exit()` function is used for this purpose.

Error Handling

It's important to note that the code provides minimal error handling. In the event of invalid user input or other issues, the code currently displays a generic "INVALID ENTRY".

Stack-Based Navigation

The code employs a stack-based navigation system to keep track of menu levels, enabling users to navigate back to previous menus as needed.

Conclusion

In summary, this Python program offers a user-friendly CLI for managing teacher and student data within a MySQL database. It integrates text-to-speech feedback for enhanced user interaction and supports operations such as viewing, adding, updating, removing, and exporting data, while allowing users to gracefully exit the program.