🎓Student Management System — Mini Project

A Python-based Student Management System integrated with MySQL that allows you to manage student records, perform real-time queries, and visualize data using matplotlib. Suitable for academic mini projects or personal learning.

📌Features

- Add, update, delete, and search student records
- Run queries on department, DOB, and more
- Paginate, sort, and filter data
- Detect duplicate emails
- Visualizations using matplotlib:
- Bar chart: Students per department
- Pie chart: Gender distribution
- Line chart: Students by birth year

🛠️Technologies Used

- Python 3.x
- MySQL (with Workbench or CLI)
- matplotlib (for plotting)
- mysql-connector-python

📂Project Structure

```
student-management/
├── student_management.py        # Core query logic
├── visualization.py             # Data visualizations
└── README.md                    # Project documentation
```

⚙️Setup Instructions

2. Set Up MySQL Database

```
CREATE DATABASE student_db;
USE student_db;
```

```sql
CREATE TABLE Students (
    EnrollmentID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50),
    Gender VARCHAR(10),
    DOB DATE,
    Email VARCHAR(100),
    Phone VARCHAR(15),
    Department VARCHAR(50)
);
```

Insert data manually using SQL queries or an external script.

3. Run Python Scripts

```
python student_management.py     # Run queries
python visualization.py          # View charts
```

📊Sample Outputs

- Command-line queries
- Visual charts in pop-up windows

Real-Time Problem Solving Examples

- List students in specific department
- Students born after 2005
- Count students by department
- Search by name or partial match
- Update contact details
- Detect duplicate emails
- Pagination of large results

📅Future Enhancements

- GUI interface using Tkinter or PyQt
- Export results to Excel/CSV
- Web version using Flask
- Login system for admin

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