COMSATS University Islamabad, Vehari Campus

Project Proposal

(SCOPE DOCUMENT)

for

School System

Version 1.0

By

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Bachelor of Science in Computer Science (2022 2026)

SCOPE DOCUMENT REVSION HISTORY

No.	Comment	Action

Supervisor Signature:_____

Date:_____

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Project Category:

- **A Desktop Application**
- **E Smartphone Application**

○ **A** Desktop Application/Information System ○**B** Web Application/Web Application based Information System ○**C** Problem Solving and Artificial Intelligence ○ **D** Simulation and Modeling ○ **E** Smartphone Application ○ **F** Smartphone Game ○ **G** Networks ○ **H** Image Processing ○Other (specify category) _____

Abstract

The proposed **School Management System (SMS)** offers a **cost effective** and **intelligent solution** designed to optimize school operations through automation. At the core of this system is the innovative **FamilyID** feature, which enables families with multiple children to manage all school related activities under a single account. This unified approach simplifies **fee management** for siblings, making it easier for both parents and school administrators to track payments and manage fee collections. The system automates critical tasks, such as **student admission**, **attendance tracking**, **class scheduling**, **examination management**, and **result processing**, thus improving efficiency and significantly reducing manual intervention. The software is developed using **Python** and **PyQt** for desktop applications, and mobile apps are created using **Flutter** or **Kivy**, ensuring accessibility across multiple platforms, specifically tailored for **local school owners**.

By centralizing essential operations, the system minimizes the reliance on paper based records, saving time and reducing administrative workload. The **FamilyID** feature not only simplifies **fee management** but also enhances **data accuracy**, allowing for efficient storage and retrieval of student and family details. This results in faster, more informed decision making, contributing to the overall operational efficiency of educational institutions. With this system in place, educational institutions will experience improved management, reduced operational overhead, and an enhanced experience for both parents and staff.

1. Introduction

In today's educational environment, many schools still rely on outdated manual systems for managing key operations like student admissions, fee collection, attendance, and exam results. These traditional methods often lead to inefficiencies, data duplication, and errors, making it difficult for school administrators to keep track of critical student and financial data. Moreover, the lack of a centralized system makes it challenging to quickly retrieve or update information, leading to delays and added administrative burden.

The proposed **School Management System (SMS)** aims to solve these problems by automating and streamlining core administrative tasks. One of the main challenges it addresses is **fee management** for families with multiple children. The **FamilyID** feature will allow siblings from the same family to be grouped under one account, ensuring a unified approach to fee payments and making it easier for both parents and school administrators to track payments and manage collections.

Additionally, the system will automate **student admission**, **attendance tracking**, **class scheduling**, **examination management**, and **result processing**. This will reduce the need for manual entry and paper based records, thus improving efficiency and accuracy. By centralizing these operations into a single platform, the SMS will provide real time access to vital information, saving time and reducing errors. The software will ensure better **data management**, more **effective decision making**, and an overall improvement in the administrative workflow of schools.

2. Problem Statement

The problem faced by many educational institutions today is the inefficiency and inaccuracy in managing administrative tasks such as **student admissions**, **attendance tracking**, **fee management**, and **result processing**. Schools often rely on manual systems, leading to data duplication, human errors, and time consuming processes. Additionally, the lack of a centralized system makes it challenging to access or update critical information quickly, which can lead to delays in decision making and hinder smooth school operations.

The proposed **School Management System (SMS)** aims to address these issues by automating key processes, centralizing student and financial data, and providing real time access to critical information. A major feature of the system is **FamilyID**, which simplifies **fee management** by grouping siblings under a single account, allowing easier tracking and management of payments.

Currently, while some school management systems exist, many lack features such as **FamilyID**, automation of **attendance**, **exam management**, or integration across platforms. The re implementation of this system offers an opportunity to learn skills in **automation**, **database management**, **cross platform development**, and **system integration**. By building

this solution, I aim to enhance my skills in software development, data management, and problem solving, while delivering a system that improves operational efficiency for schools.

3. Problem Solution for Proposed System

The proposed School Management System (SMS) addresses inefficiencies in school administration by automating key tasks like admissions, attendance, fee management, scheduling, exams, and results. It replaces manual, error prone processes with a centralized MySQL database, ensuring real time data access and eliminating duplication. The FamilyID feature groups siblings under one account, simplifying fee tracking and management for families and admins. Admissions are streamlined through online forms and an admin approval interface, reducing paperwork. Attendance tracking is made easy with a simple UI for teachers to mark daily records and generate reports. Scheduling allows admins to create and share timetables efficiently. Exam management automates mark entry and report card generation, ensuring accuracy. The system's user friendly design, built with Python + PyQt for desktop and Flutter/Kivy for mobile, caters to non technical staff with clear interfaces and minimal clicks. Data validation prevents errors, like invalid phone numbers. A secure login system protects sensitive data, such as fees and contacts. The SMS improves decision making by providing quick access to organized data. It supports scalability for 500+ students, ensuring long term usability. By integrating all modules, the system reduces administrative burden and enhances efficiency. Overall, the SMS delivers a robust, automated solution tailored for schools.

4. Advantages/Benefits of Proposed System

i. **Automation of Tasks**: The SMS automates admissions, attendance, fee management, scheduling, exams, and results, reducing manual work, minimizing errors, and saving time for school staff.
ii. **Centralized Data Management**: Using a MySQL database, the system stores all data in one place, enabling real time access and eliminating data duplication for admins, teachers, and parents.
iii. **Simplified Fee Management with FamilyID**: The FamilyID feature groups siblings under one account, making fee tracking, invoice generation, and payment management easier for families and administrators.
iv. **User Friendly Design**: Built with Python + PyQt (desktop) and Flutter/Kivy (mobile), the system offers intuitive interfaces with clear buttons and minimal clicks, designed for non technical staff like teachers and clerks.
v. **Improved Accuracy and Efficiency**: Automated processes like mark entry, grade calculation, and report generation ensure accuracy, while quick data retrieval enhances decision making.
vi. **Scalability and Security**: The system supports 500+ students and includes secure login to protect sensitive data, such as fees and contact details, ensuring long term usability.
vii. **Cost Effective Solution**: By reducing paperwork and administrative workload, the SMS lowers operational costs and provides a standalone solution without needing

external integrations.

5. Scope

The School Management System (SMS) is designed to automate and streamline core administrative tasks for schools, including student admissions, attendance tracking, fee management, class scheduling, examination management, and result processing. The system introduces a FamilyID feature to group siblings under a single account, simplifying fee tracking and storing family contact and emergency details. It will be developed as a desktop application using Python + PyQt for administrators and teachers, and a mobile application using Flutter or Kivy for parents, with all data centralized in a MySQL database. The SMS focuses on user friendly interfaces tailored for non technical staff, ensuring ease of use with clear navigation and minimal clicks. Key functionalities include online admission forms, daily attendance marking, timetable creation, mark entry with automated grade calculation, and report card generation. The system ensures data security through basic authentication and supports scalability for at least 500 students. It operates as a standalone solution without integration with external systems or third party tools like payment gateways. Out of scope features include advanced functionalities like biometric attendance, email/SMS notifications, or support for non school institutions. The project aims to enhance administrative efficiency, reduce errors, and provide a centralized platform for school data management. By developing this system, the goal is to learn skills in Python, PyQt, Flutter/Kivy, MySQL, and UI/UX design.

6. Modules

1. **Fee Module**
    - **Description**: Groups siblings under a single FamilyID to simplify fee management and store family contact/emergency details.
    - **Features**: Create FamilyID, track fees (due, paid, pending), generate invoices, update contact info.
    - **Special Feature**: Unique FamilyID system to streamline sibling fee tracking, reducing complexity for parents and admins.
2. **Admissions Module**
    - **Description**: Manages student admission process with online forms and admin review.
    - **Features**: Submit student details/documents, approve/reject applications, track status.
3. **Attendance Module**
    - **Description**: Allows teachers to mark daily attendance and generate reports.
    - **Features**: Mark present/absent, view daily/monthly attendance summaries.
4. **Scheduling Module**
    - **Description**: Facilitates creation and viewing of class timetables.

- **Features**: Assign teachers/subjects, display schedules for students/teachers.

5. **Exams & Results Module**
   - **Description**: Automates mark entry, grade calculation, and report card generation.
   - **Features**: Input marks, auto calculate grades, generate/download report cards.
6. **Staff Registration Module**
   - **Description**: Manages registration and details of school staff (teachers, admins, etc.).
   - **Features**: Add/edit staff profiles (name, role, contact, qualifications), assign roles, track staff records.
   - **Special Feature**: Centralized staff database for easy management and role based access control.
7. **Accounts Module**
   - **Description**: Handles financial transactions beyond FamilyID fees, including school expenses and revenue tracking.
   - **Features**: Record income (e.g., fees), track expenses (e.g., salaries, utilities), generate financial reports.
   - **Special Feature**: Comprehensive financial overview with automated report generation for school budgeting.

7. Software Process Methodology

I. **Methodology**: Object Oriented Methodology will be used to develop the SMS, focusing on modular, reusable, and maintainable code for features like FamilyID, admissions, and attendance.

II. **Reason for Choice**: It aligns with Python's strengths in PyQt and Flutter, supports scalable design, and suits my expertise in structuring complex systems efficiently.

8. Tools and Technologies

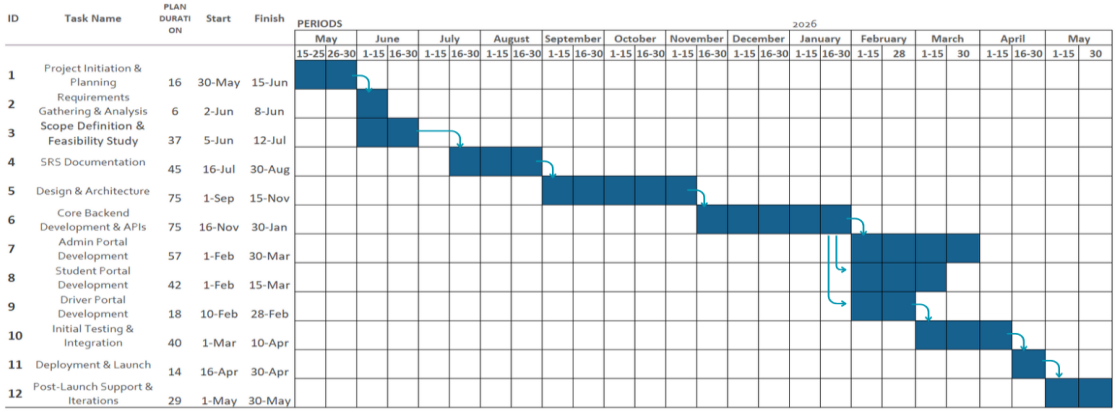
Tools and Technologies	Tool	Version	Rationale
Tools	Visual Studio Code	1.93.1 (Sept 2024)	IDE for coding Python, Dart, and SQL with extensions for Flutter and MySQL.

	MySQL Workbench	8.0.38 (May 2024)	GUI tool for designing, managing, and querying MySQL databases (online/offline).
	cPanel	Latest (2025)	Hosting platform for MySQL database, supporting online/offline access.
	MS Word	2021/365	For project documentation (scope, user manuals).
	MS PowerPoint	2021/365	For project presentations or demos.
	Figma	Latest (2025)	For creating UI mockups for desktop and mobile apps.
Technologies	Python	3.12.3	Programming language for desktop app (PyQt) and backend APIs (Flask/FastAPI).
	PyQt5	5.15.11	Framework for building desktop app's GUI with Python.
	Flutter	3.32.3	Cross platform framework for mobile app development (Android/iOS).
	Dart	3.5.4	Programming language for Flutter mobile apps.
	MySQL	8.0.38	Relational DBMS hosted on cPanel for online/offline data storage.
	SQL	8.0 (MySQL)	Query language for managing database records.
	Flask/FastAPI	Flask 3.0.3 / FastAPI 0.115.2	Python frameworks for REST APIs to connect apps to MySQL.
	Android SDK	35 (API Level 35)	For building and testing Flutter app on Android.

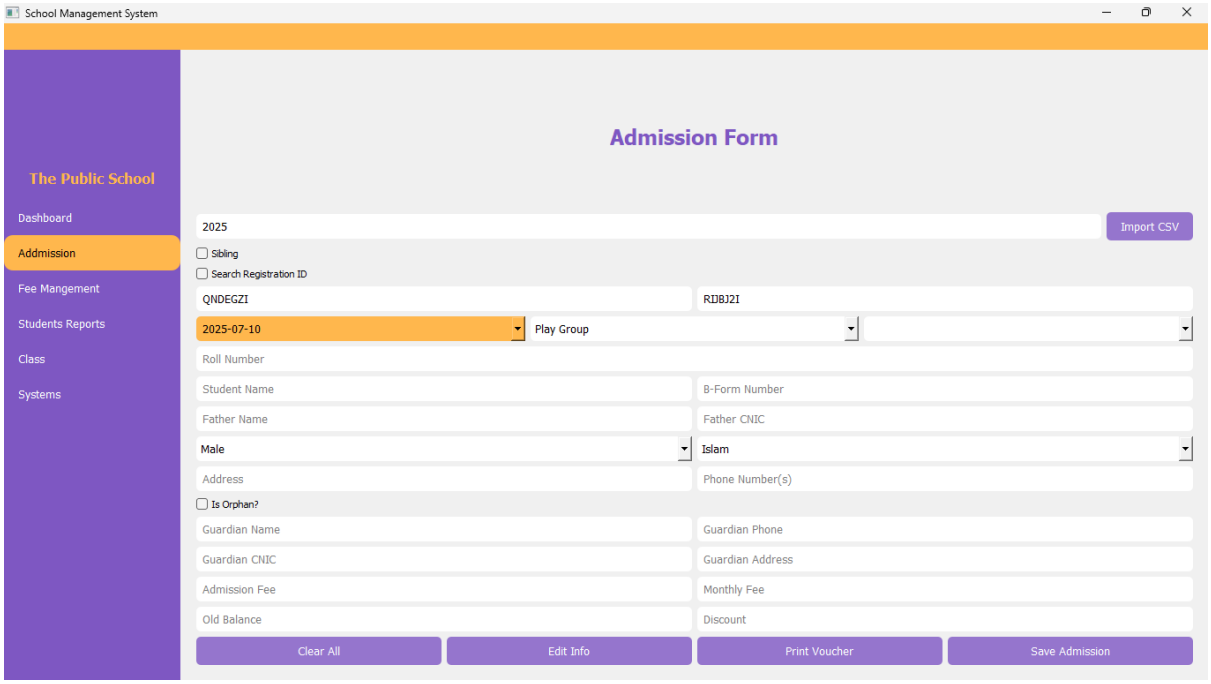
9. Concepts

1. **Object Oriented Programming (OOP)**
    - Use OOP to create modular, reusable code for SMS features like FamilyID using Python and Dart.
    - Learn encapsulation, inheritance, and polymorphism for scalable design.
2. **Database Management with MySQL**
    - Design MySQL database on cPanel for student and fee data with SQL queries.
    - Master schema design and JOINs for efficient data handling.
3. **REST API Development**
    - Build Flask/FastAPI APIs to connect PyQt and Flutter apps to MySQL.
    - Learn HTTP methods and JSON for secure data exchange.
4. **User Interface (UI) Design**
    - Create simple, non technical UIs with PyQt and Flutter for easy navigation.
    - Use Figma for prototyping user friendly designs.
5. **System Integration**
    - Integrate desktop, mobile, and MySQL via APIs for seamless data sync.
    - Ensure secure online/offline data access with authentication.

10. Gantt chart



11. Mockups


School Management System
The Public School
Dashboard
Addmission
Fee Mangement
Students Reports
Class
Systems
Admission Form
2025
Import CSV
Sibling
Search Registration ID
QNDEGZI
RJBJ2I
2025-07-10
Play Group
Roll Number
Student Name
B-Form Number
Father Name
Father CNIC
Male
Islam
Address
Phone Number(s)
Is Orphan?
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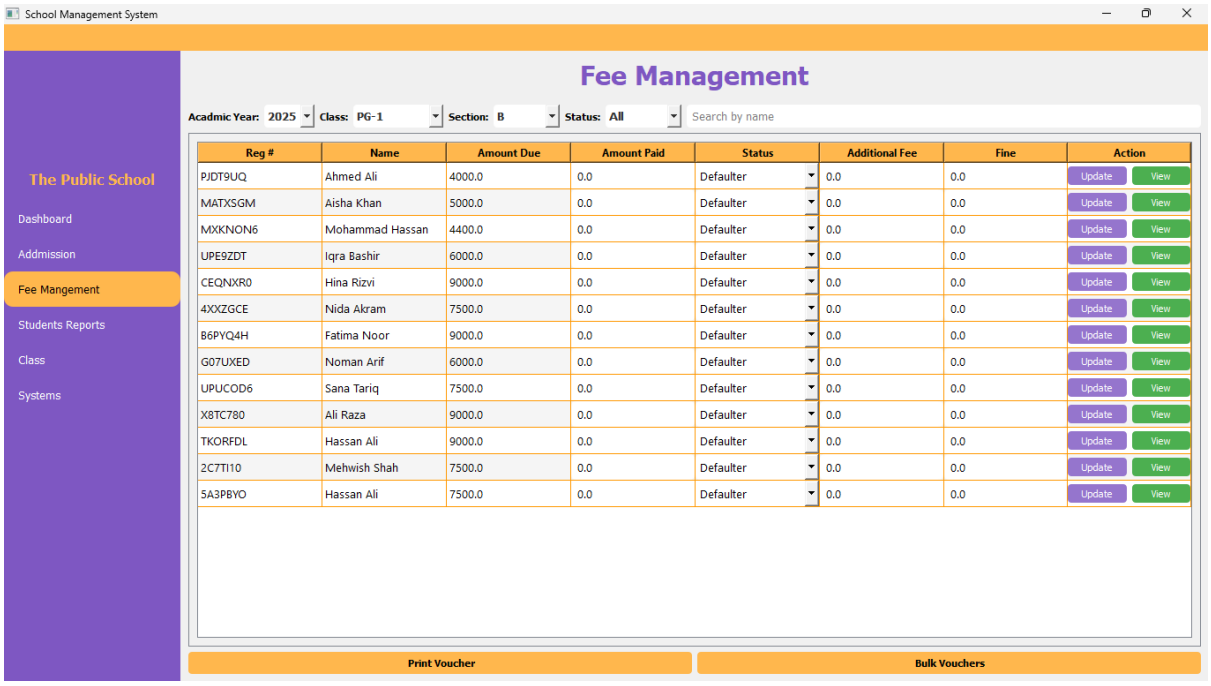
Guardian CNIC
Guardian Address
Admission Fee
Monthly Fee
Old Balance
Discount
Clear All
Edit Info
Print Voucher
Save Admission


School Management System
The Public School
Dashboard
Addmission
Fee Mangement
Students Reports
Class
Systems
Fee Management
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Section: B
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Search by name
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MATXSGM Aisha Khan 5000.0 0.0 Defaulter 0.0 0.0 Update View
MXKNON6 Mohammad Hassan 4400.0 0.0 Defaulter 0.0 0.0 Update View
UPE9ZDT Iqra Bashir 6000.0 0.0 Defaulter 0.0 0.0 Update View
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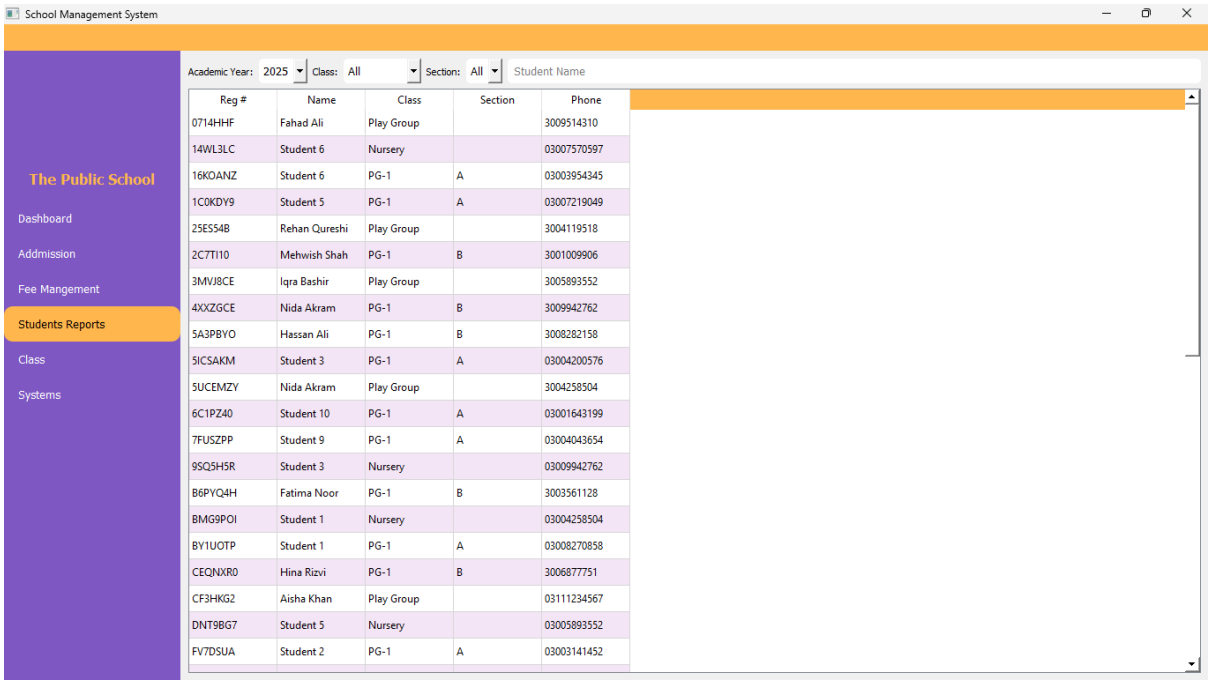
School Management System
The Public School
Dashboard
Addmission
Fee Mangement
Students Reports
Class
Systems
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Class: All
Section: All
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Reg #
Name
Class
Section
Phone
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Play Group
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Student 6
Nursery
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16KOANZ
Student 6
PG-1
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Student 5
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Rehan Qureshi
Play Group
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Mehwish Shah
PG-1
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Iqra Bashir
Play Group
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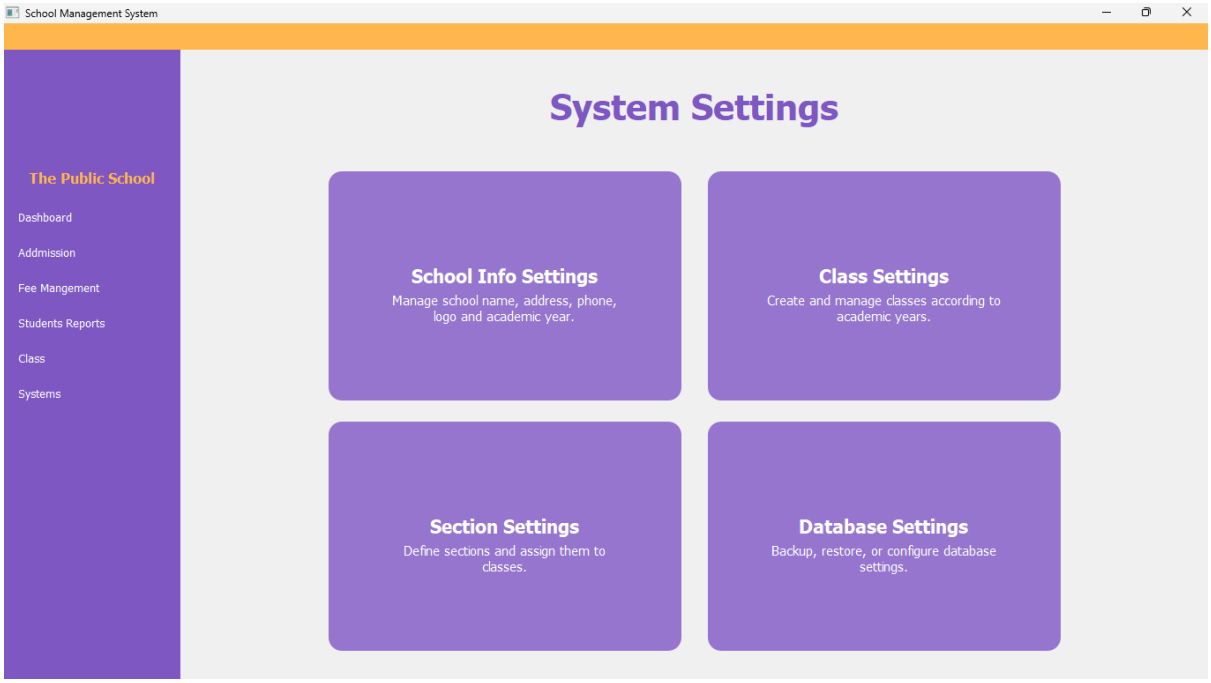
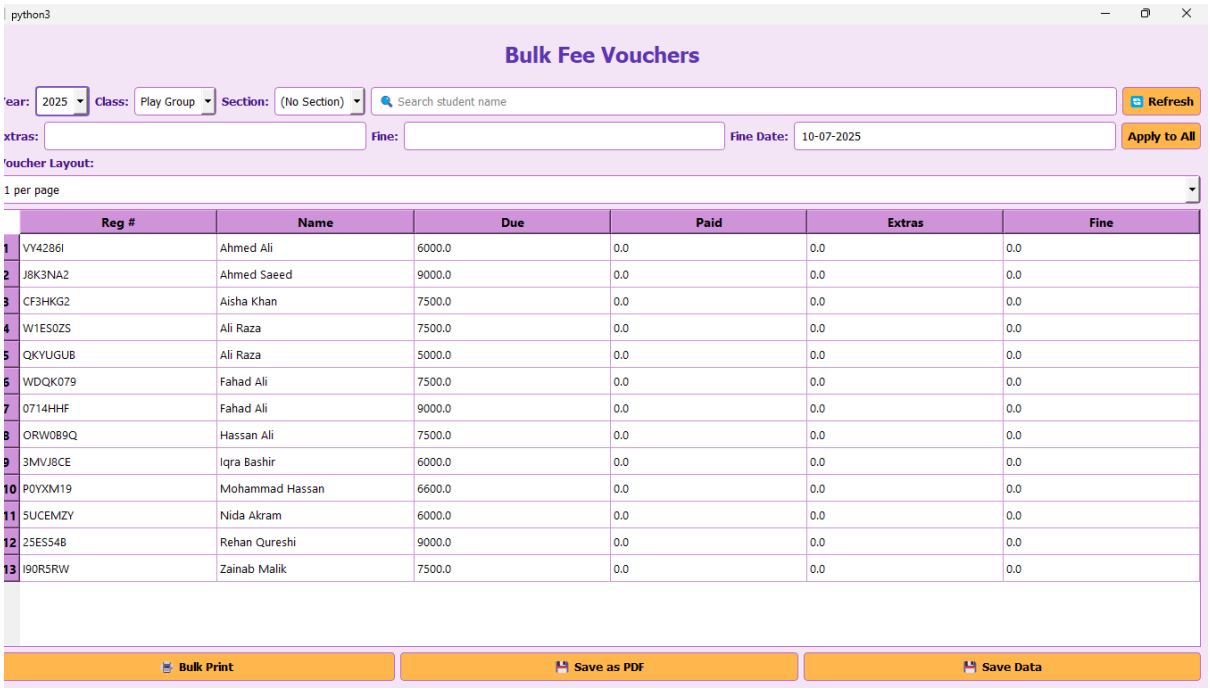

School Management System
The Public School
Dashboard
Addmission
Fee Mangement
Students Reports
Class
Systems
System Settings
School Info Settings
Manage school name, address, phone, logo and academic year.
Class Settings
Create and manage classes according to academic years.
Section Settings
Define sections and assign them to classes.
Database Settings
Backup, restore, or configure database settings.



12. Conclusion

The School Management System (SMS) automates key school tasks like admissions, attendance, fee management, scheduling, staff registration, accounts, and results, improving efficiency and reducing errors. The FamilyID feature simplifies fee tracking for siblings, enhancing user experience for parents and admins. Built with Python, PyQt, Flutter, and MySQL on cPanel, it ensures scalability and online/offline access via APIs. User friendly interfaces cater to non technical staff, with secure data management. The project helps learn OOP, database management, API development, UI design, and system integration.

THE END