SMART ETUITION INFORMATION
SOFTWARE DESIGN DESCRIPTIONS (SDD)

Version 3.0

SEMESTER MARCH – AUGUST 2022

GROUP: CS1104D

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Smart E-Tuition System	Version: 3.0
Software Design Descriptions (SDD)	Date: 08/05/2022
Adib Asyraaf (Person In Charge)	

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Revision History

Name	Date	Reason For Changes	Version
Everyone	5 May, 2022	Start making progress for Software Design Descriptions (SDD)	1.0
Everyone	7 May, 2022	Improvement and more details being added into each topic and category	2.0
Everyone	8 May, 2022	Final touchup and changes	3.0

Introduction

Document Purpose

This software design description document describes the architecture and system design of the Score E-Tuition system. Firstly, this document is intended for the programming team for Score E-Tuition System to utilise the designs as guidelines to implement the project for ISP250 from University Technology of MARA Kedah branch.

This document also serves as a resource for Mr. Suhardi Hamid, the team's instructor, as it fulfils a project requirement. Designers attempting to improve or alter the current design of the software system may use this document as a reference if modifications are necessary.

Product Scope

- The system will only be accessible to students who have paid tuition.
- The system will be accessible only to tutors who have been assigned lessons
- Every user can only access the system using the username and password associated with their designated role type.

The objective of the system is to ease the students attaining high grade scores for SPM by using online system for registering account, subject and to communicate with the tutor for starting the online class.
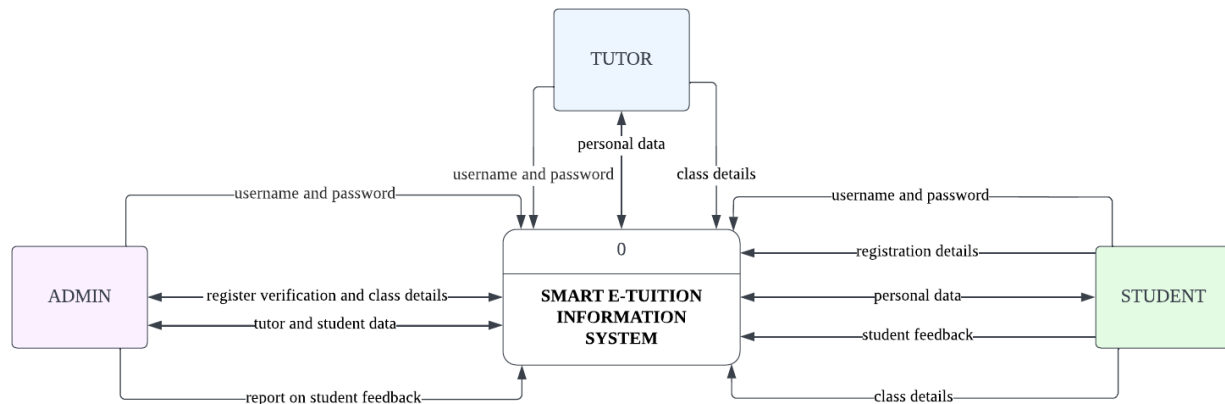
System Overview

Context Diagram

Figure 1: Smart E-Tuition Information System Context Diagram

Below are the descriptions of the proposed information system according to the provided diagram in Figure 1:

Entity	Data	Description
Student	username and password	Students are required to register their username and password on the system. Their username and password will be used to log into the student dashboard.
	registration details	Students are required to register themselves by filling up the registration form.
	personal data	Students are able to view and update their personal data if they notice any errors that have been submitted.
	student feedback	Students are able to give feedback.
	class details	Students are able to view their class details once they have registered for any subject.
Admin	username and password	Admins have their own username and password that they can use to log in to the admin dashboard.

	register verification and class details	Admins are able to verify and update student registration and class details.
	tutor and student data	Admins are able to update tutor and student data if they notice any errors that have been submitted.
	report on feedback	Admins are able to view and delete student feedback.
Tutor	username and password	Tutors are given their own username and password to log into the tutor dashboard.
	personal data	Tutors are able to view and update their personal data if they notice any errors that have been submitted.
	class details	Tutors are able to view and update class details.

Table 1: Descriptions of the proposed information system.

Diagram 0

Figure 2: Smart E-tuition Information System Level 0 Diagram. (Refer Appendix A)

A diagram 0 provides a fundamental overview of the entire system or process being analyzed or modeled. It is intended to provide a quick overview of the system as a single, high-level process with its connections to external entities.

There are eight processes represented in the system in diagram 0 overall. Register, login, manage personal data, manage classes, register for classes, view classes, submit feedback, and view feedback are some of the processes. The system uses four databases, as depicted in the diagram. The user can subsequently view the data that is stored in the database. Every piece of personal information is stored in the user information database, and when a user tries to log in to the system, the same information is used.

Once logged in, a user can control their personal data. Administrators, tutors, and students are the three different user types who have the ability to update their data. Managing the class is the next step. Every class detail is saved in the database so that students can access it afterwards. To prevent students from abusing the system to alter the class session, only the administrator and tutors are permitted to make changes to the class information.

The students will register for classes, and the information will then be entered into a database. Every level of user has access to the class information for their own use. Both the tutors and the students have access to the class information, which they may use to confirm that everyone showed up for class. The administrator can access the specifics of each class to change and analyse the data. The students can add feedback and store it in the database as a final step. The administrator will then have access to the database for analysis purposes.

Functional Decomposition Diagram

Figure 3: Smart E-Tuition Information System Functional Decomposition Diagram. (Refer Appendix B)

Each user in this functional decomposition diagram has access to a wide range of tasks. There are six tasks that the user can carry out at the administrator level. The administrator receives complete access to student and tutor information, allowing reading, viewing, updating, and deletion of the data. This is necessary because only the administrator should be privy to all user information and should have access to it in the event that reports or analyses of user data are required. Additionally, the administrator has practically total access to the information on class verification and class details, enabling them to inspect, add, and change the information. This is required when the class needs to be altered or the student verification needs to be updated. For reasons of integrity, only the administrator can access this data control. Regarding student input, the administrator can only examine and delete the information because they are unable to contribute anything unless it is genuine student feedback.

The user listed below is the tutor. Since they are not the owners of the data, these individuals are only allowed to view the student details and not alter them. Both the tutor's and the pupils' information are available to them, and they have editing privileges. Personal data supplied by the user may be amended if necessary or if it was input mistakenly. The tutors may also edit the information about the class if the time or schedule are changed.

The last user is the student. The student can add to the class registration and view the data. Every time the student registers for any subject, a new entry is added into the system. They can only view the class details as a reference to join the class session. As for all users, the student can view and update their personal details in case data changes are needed. Lastly, the students are able to add feedback to the system for the administrator to review.

Database Design

Entity Relationship Diagram

Figure 4 and 5: Smart E-Tuition Information System Entity Relationship Diagram (ERD).
(Refer Appendix C)

An entity relationship diagram (ERD) is a graphical representation that depicts relationships the objects in Smart E-Tuition Information System. The system uses Crow's Foot and there are four entities in total which are user, class, register, and feedback in the current diagram.

To begin with, there is the user entity. The primary key is the user ID, which uniquely identifies each user and automatically increments by one upon addition. The entity's attributes are the fundamental information about the user required to register for the system. There are three types of users in the system: students, tutors, and administrators. Each user type incorporates all of the user entity's attributes. However, the user level attribute is available to help differentiate between each of the user types. In the database, the administrator, tutor, and student user levels are 1, 2, and 3, respectively. User entity are all relatable with:

- Feedback entity, where students can give feedback and admin manage feedback.
- Register entity, the student's registration information. Administrators has the ability to view and manage registration verification.
- Class entity, the class selected by the student during registration. Administrators and tutors can manage classes.

Following is the class entity. The primary key is the class ID, which functions similarly to the user ID in user entity in that it uniquely identifies each class and automatically increments by one upon addition. The entity's attributes describe the details of the class, such as the topic, the location of the online meeting, and the time of the class.

Next is the register entity. Due to the many-to-many relationship between the user entity and the class entity, register entity serves as a bridge table between them. The bridge table helps properly join the data streams that exist on each side of the bridge. There are three primary and foreign keys in the same attribute: admin ID, student ID, and class ID from the user and class entities, respectively. The register entity describes the registration details, including the registration date (automatically generated), proof of payment, and register approval. There are three types of register approval: 1 (approved), 2 (declined), and 3 (pending).

Finally, we have the feedback entity. The feedback ID is the primary key, and it is automatically incremented by one for each unique piece of feedback. The feedback entity describes the information required when a student provides feedback, including the feedback's title, comment, and date. One of the foreign keys is the admin ID, which allows the administrator to manage the feedback system and is automatically updated whenever the administrator modifies particular feedback. For the student ID, it is useful to identify which student provided feedback for a given feedback ID.

Data Dictionary

A data dictionary comprises the names, definitions, and attributes of the data elements utilized or captured by a database. This information is all shown in the Smart E-Tuition Information System database tables below. Note that the yellow key icon indicates the primary key while the grey key icon indicates the foreign key.

User Table

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action		
☐	1	userID 🔑	int(4)			No	None		AUTO_INCREMENT	🖉 Change	⊖ Drop	More
☐	2	userLevel	int(1)			No	3			🖉 Change	⊖ Drop	More
☐	3	userUname	varchar(100)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊖ Drop	More
☐	4	userPassw	varchar(100)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊖ Drop	More
☐	5	userName	varchar(100)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊖ Drop	More
☐	6	userPhone	varchar(11)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊖ Drop	More
☐	7	userEmail	varchar(100)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊖ Drop	More
☐	8	userGender	int(2)			Yes	NULL			🖉 Change	⊖ Drop	More
☐	9	userBirthdate	date			Yes	NULL			🖉 Change	⊖ Drop	More
☐	10	userAddress	varchar(100)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊖ Drop	More
☐	11	userCode	int(10)			Yes	NULL			🖉 Change	⊖ Drop	More

Class Table

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action		
☐	1	classID 🔑	int(4)			No	None		AUTO_INCREMENT	🖉 Change	⊘ Drop	More
☐	2	classSubject	varchar(50)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊘ Drop	More
☐	3	classLink	varchar(100)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊘ Drop	More
☐	4	classDay	varchar(50)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊘ Drop	More
☐	5	classTime	time			Yes	NULL			🖉 Change	⊘ Drop	More
☐	6	classFee	int(3)			No	50			🖉 Change	⊘ Drop	More
☐	7	totalStudent	int(10)			No	0			🖉 Change	⊘ Drop	More
☐	8	adminID 🔑	int(4)			No	None			🖉 Change	⊘ Drop	More
☐	9	tutorID 🔑	int(4)			No	None			🖉 Change	⊘ Drop	More

Register Table

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action		
☐	1	classID 🔑	int(4)			No	None			🖉 Change	⊘ Drop	More
☐	2	stuID 🔑🔑	int(4)			No	None			🖉 Change	⊘ Drop	More
☐	3	adminID 🔑🔑	int(4)			No	None			🖉 Change	⊘ Drop	More
☐	4	registerDate	timestamp			Yes	current_timestamp()			🖉 Change	⊘ Drop	More
☐	5	proofPayment	varchar(200)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊘ Drop	More
☐	6	registerApproval	int(2)			Yes	NULL			🖉 Change	⊘ Drop	More

Feedback Table

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action		
☐	1	fbID 🔑	int(4)			No	None		AUTO_INCREMENT	🖉 Change	⊘ Drop	More
☐	2	fbTitle	varchar(200)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊘ Drop	More
☐	3	fbComment	varchar(2000)	utf8mb4_general_ci		Yes	NULL			🖉 Change	⊘ Drop	More
☐	4	fbDate	timestamp			Yes	current_timestamp()			🖉 Change	⊘ Drop	More
☐	5	adminID 🔑	int(11)			Yes	NULL			🖉 Change	⊘ Drop	More
☐	6	stuID 🔑	int(11)			No	None			🖉 Change	⊘ Drop	More

Functional Requirements

Users/ Stakeholders	Function	Description
User	Free sign up for user	A user can sign up and create a user account without an intermediary person to validate the registration process.
	Class registration	Users can register for as many classes as they want.
	Feedback process	Users can give feedback on how satisfied or unsatisfied they are with the Smart E-Tuition Information system.
User, Tutor	Check classes' details	Users and tutors can view the details involved with their respective classes.
	Personal data management	Users and tutors can edit, update, and delete their personal data.
Admin	Managements	Admin can manage various data. For example, tutor's data, student's data, class data, and managing class verification.
	View record	Admin can view users' feedback and their classes' registration.
User, Admin, Tutor	Login process	After completing the registration process, users can log in to the information system.

Table 2: Functional requirements for Smart E-Tuition Information System
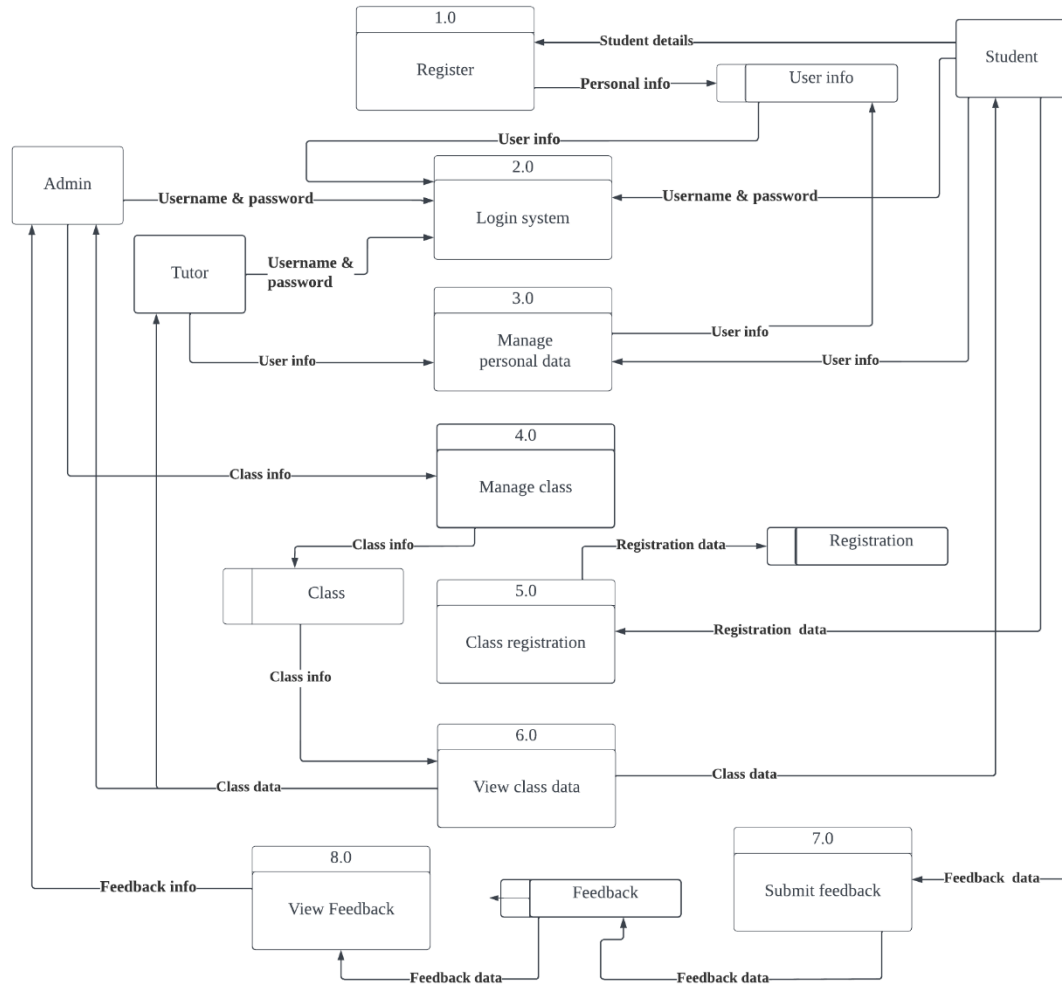
Appendix

Appendix A

Figure 1: Smart E-tuition Information System Diagram 0

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Appendix B

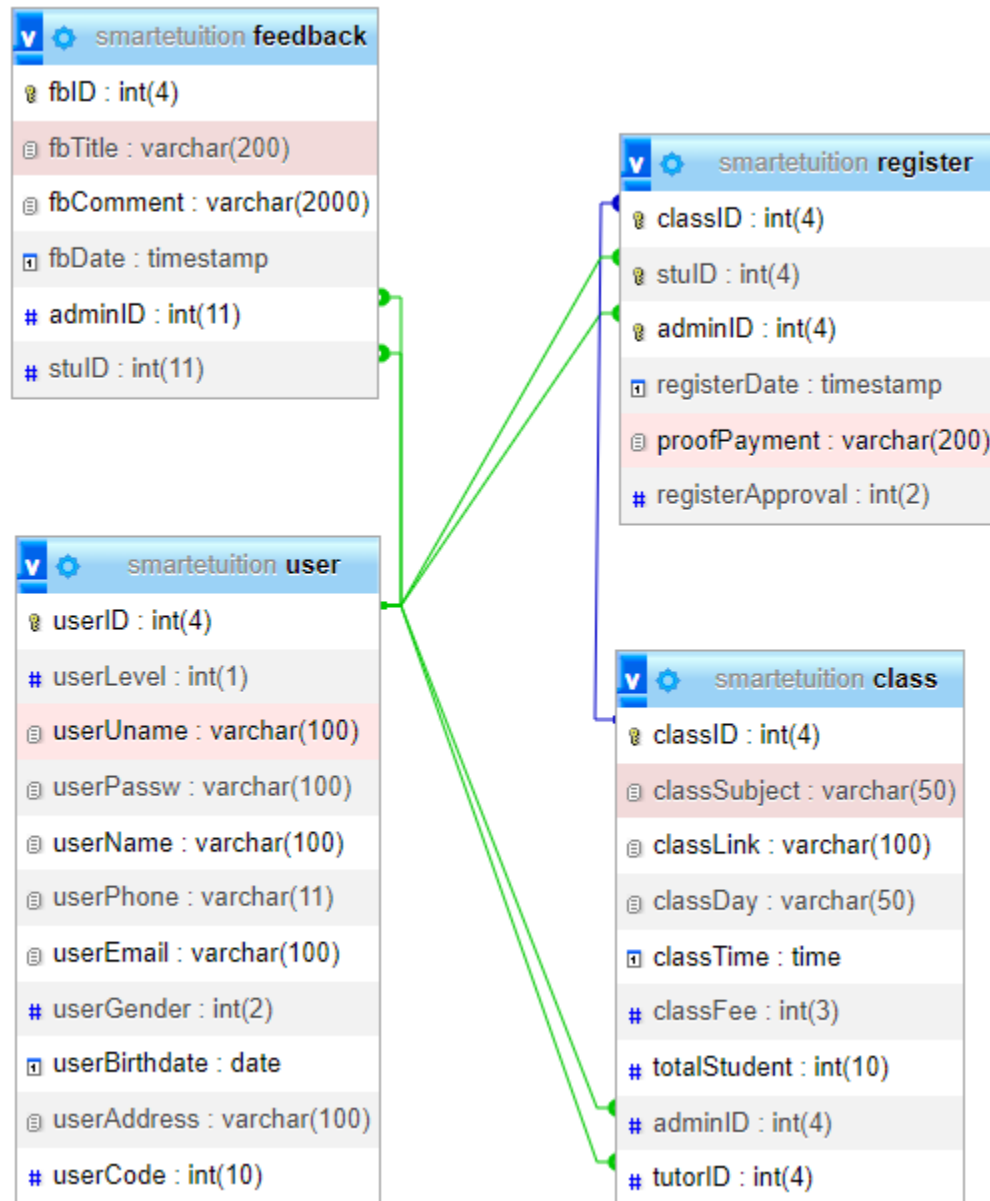**Figure 3: Smart E-Tuition Information System Functional Decomposition Diagram**

Appendix C

Figure 4: Entity Relationship Diagram for Smart E-Tuition Information System (From the physical database of phpMyAdmin)
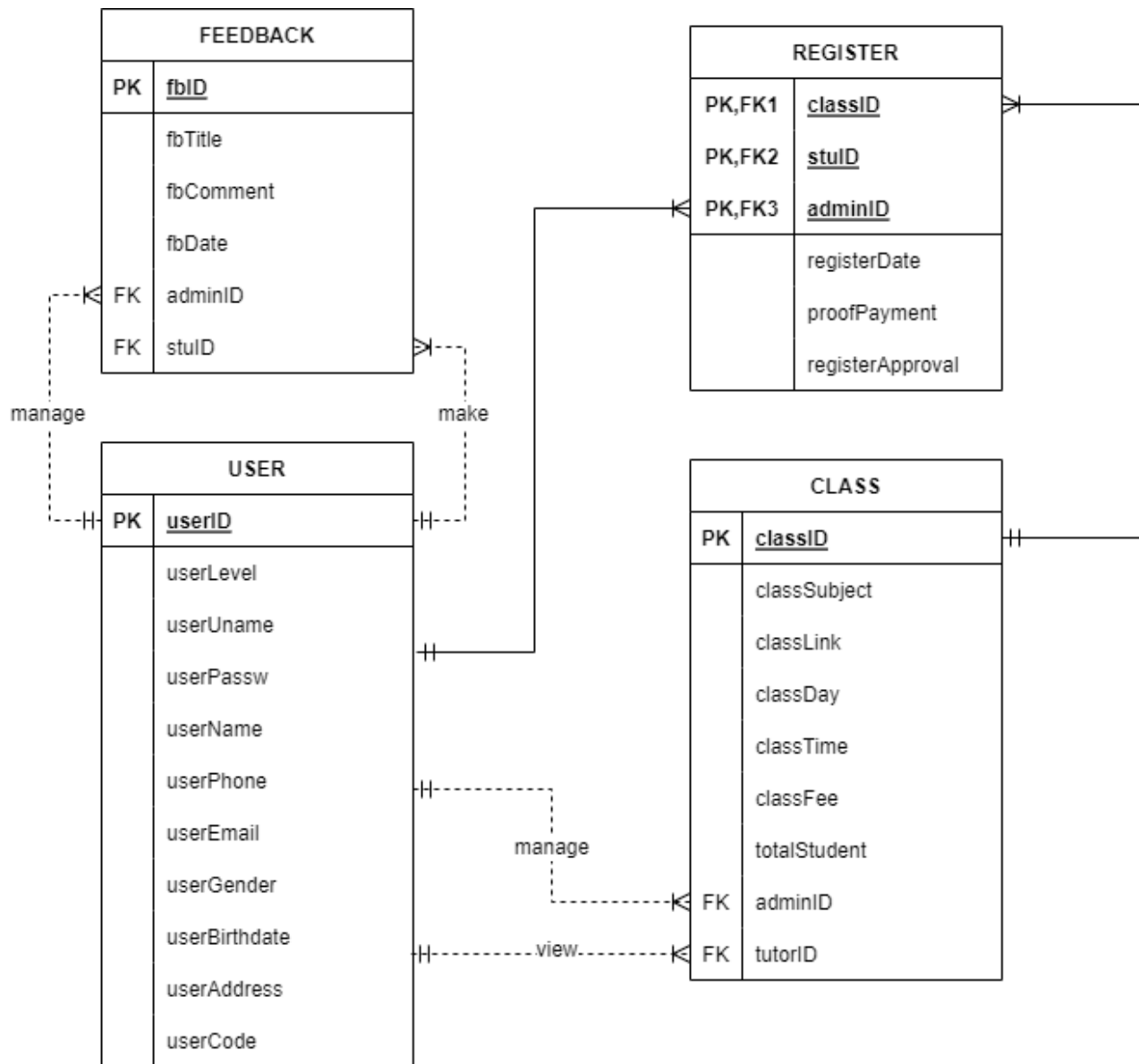
Figure 5: Entity Relationship Diagram for Smart E-Tuition Information System (Crow's Foot)