Development of MIS for Training Institute using MySQL, NodeJs, ExpressJs and Handlebars

Submitted in partial fulfillment of the requirements
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by

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2. Ranjit Parshuram Pandey (01)
3. Ayush Ravishankar Tiwari (40)

Date:

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Abstract

Management information system requires a robust method which maintains the records and the best is achieved by RDBMS by using MySQL community server. As the frontend is quite complex for a user which demands much information so we use handlebars engine to render it. NodeJs has a wide community support as a backend technology and various node modules which act as middleware and help in achieving the project goal.

Coaching institutes find hindrances in maintaining information of their students and staff and most of them lack their presence on the internet so to help them out an web application has been created which takes care of all the administrators task in one place, provide a view of students in a class, they don't need to keep viewing the diary or their record book for said purpose.

The web application provides the administrator with creation of teacher, student accounts which creates a random password and is communicated via email, a class is created which is customized in sense of board, standard and subject selection a class can be assigned to multiple teachers from the class section. The student view from the dashboard displays all the students in your institute, their enrolled classes, and their parent details. Whereas the teacher view presents subjects assigned along with salary details. The class presents a list of classes in your institute, the one you create with associated board, standard and subject. It also lists down enrolled students in each class. The web application also has a miscellaneous section which performs create, read, update and delete operation on board, subject and standards entities. The administrator needs to circulate important information among teachers, parents and students so we have an invite section for it.

C O N T E N T S

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Abbreviations And Symbols

MIS	Management Information System
RDBMS	Relational database management system
PAAS	Platform as a service
DFD	Data flow diagram
RDS	Relational database service
GANTT	Generalized activity normalization time table

Chapter 1. Overview

1.1. Introduction

Consolidated view of classes running in the training institute are often mentioned into an excel file or diary which could be lost and maintaining different files for each of things such as teachers, students, subjects taught in the institute can make you access the same content every time you access the resource. So the concept of master class where the administrator will maintain the record of each of the members as and when they join, so repeatedly tasks which needs to be performed every academic year will be nullified.

1.2. Background

Tuition centers either maintain a book with columns or create an excel sheet for students studying in a class, teachers assigned to a particular class. These all information is vital for at least an academic year and if preserved helps to maintain a healthy track record of the institute. Sending emails by searching, sorting and adding them to the email list is a routine task for any planned virtual meet.

1.3. Importance of the project

The project is important for the small and mid-sized institutes which provide tuition or coaching services and where business model is such as only students make selective choice, for ex some students prefer to practice mathematics and Marathi, whereas some choose coaching for all subjects. So to have information which is organized and lists students in that class, invite parents, teachers, students for meet, rather than composing an email from scratch, only virtual meet link and body is required.

1.4. Perspective of stakeholders and customers

Customers have a bird eye perspective as list of all the students, teachers customized set of board, standards and subjects, easy view of enrolled students and easy to use. Modification of subjects assigned to teachers, truncate unnecessary information with high quality graphics.

1.5. Objectives and scope of the project

The web application will ensure data access by the administrator, special access to intended person. Fully customized platform only include the things you do and want in your institute, no pre-defined options, unless it has to. It provides with

a. New class (customized standard, subject and board)

b. Add students with some basic parent information

c. Assign multiple subjects to a teacher.

d. View list of students enrolled in a particular class.

e. Invitation for virtual meet to parents, students and teachers.

1.6. Summary

The crux of the same is to have a digital record of essential information which is the epicenter for all sort of communication. Let it future communication with alumni students on feedback, or as a staff and let everyone attend the meet let it be in person or virtual. As the institution grows one cannot work without a database as performing redundant tasks again and again reduces the efficiency.

Chapter 2. Literature Survey & Proposed Work

2.1. Introduction

Research based on management system how are they organized is crucial for our project. What is the actual problem, is it feasible enough to be valued and methodology's used maybe agile, scrum, spiral. Who will use the project is it a team of people or various divisions need to be done in order to achieve the goal.

2.2. Literature Survey Table

Table 1 Literature survey table

Sr No	Paper title	Author	Y.O.P	Idea	Future Scope	Gap identification
1	Student Information Management System	Dipin Budhrani, Vivek Mulchandan, Yugchhaya Galphat	2018	In this paper the information of a student is maintained, there information about the academics, and sports is stored and if because of some reason they fail to complete any of the activity than the student will be alerted regarding the same.	We can make it compatible for the fitness band and the logs for sports section can be auto filled.	It is really not convenient for the students to log all the activities and that's a hassle for them.
2	Use of Artificial Intelligent in Learning Management System (LMS)	Nouf S. Aldahwan, Nourah I. Alsaeed	2020	There is a need for analytical tools to help analyze LMS data, and to provide new information to develop and even design new eLearning techniques and methodologies, according to several studies.	A more generalized survey of the LMS keeping teachers at the center to identify and suggest the modifications.	There is no comparison between LMS platforms, identify the pros and cons and get the crux.
3	Expert Management System – A Tuition Management System	Abdul Raheem Tanwar , Harshil Choudhary, Pravin Shinde, Sahil Dighe	2021	Detailed information about requirements of tuition, technologies which can be used for smooth development.	Implementation of the information system for the specified domain.	The flow of data across the proposed system is missing. The technology Tkinter is not deployable at the server, so the project designed can be installed on localhost.

4	ERP Systems and their Effects on Organizations: A Proposed Scheme for ERP Success	Khaled Almgren, Cristian Bach	2014	ERP has many advantages, if the employees and the management are ready to take the learning as it will make the process smooth. Proper steps to implement ERP lead by specialist people, to transform the traditional system by ERP.	Analysis of advanced ERP systems. Errors caused by those will help new customers to avoid those. Issues by ERP such as Y2K bug and revenue loss by water corporation caused due to costly hardware and lack of training respectively.	Difference between traditional ERP and advanced ERP. More ERP bugs and case studies are required.
5	Information and Knowledge Management at Higher Education Institutions	Richard Pircher & Attila Pausits	2011	For an institution to function as an integrated whole, it needs IT infrastructure that adequately handles all the institutional processes and administrative functions and that also supports strategic decision-making by management	Organizations must have a chief information officer who is responsible for the well perseverance and authenticity of the information that is made available to the decision making authorities.	On the data entry/data retrieval level, the architecture of application systems is basically well developed. By contrast, decision support systems are still rather weak. Because it is much more oriented towards administrative tasks
6	The Impact of ERP System on Academic Performance : A Case Study Approach	Ahmad Saleh Shatat	2019	The modules explored in this study provide a clear understanding of the most essential modules that contribute to improving the AP, namely, SISs, FIS, and to a lesser extent, HRS.	The continuous and deep understanding of all modules of ERP system will certainly enhance the impact of this system on AP and end up with streamlined academic processes in the Universities context.	Currently, there are many Universities are not fully aware of the ERP system. This is mainly due to lack of awareness that the ERP the system is very useful to all stakeholders particularly the lecturers and the students.

7	Enterprise Resource Planning System in Higher Education	Prof. Balasaheb Ningappa Bhamangol, Dr. Vilas Dattu Nandavadekar, Prof. Sunil Hanmant Khilari	2011	This paper aims on benefits, security checklists and percentage of customization of Educational ERP systems in Higher Education.	Researchers contribute to more advanced ERP systems which is time consuming and aims to complete a couple of checklist majorly focusing security.	ERP systems are very costly implementation is time consuming, and the massive task/ processes can sometimes take its toll on the staff tasked with its use and implementation.
8	Review on Management Information Systems (MIS) and its Role in Decision Making	Lahar Mishra, Ratna Kendhe, Janhavi Bhalerao	2015	This paper focuses on understanding the concept, advantages of MIS in an organization and majorly the role of MIS in decision making.	The MIS strategy should be tailored to the needs of the company and should seek to fulfil the company's objectives.	Organizations not able to ensure top level management involvement for smooth functioning of the organization when it comes to MIS. Decision making in such organizations is slower and is outdated as compared to modern and business practices.
9	Parental Role and Support for Online Learning of Students With Disabilities: A Paradigm Shift	Sean J. Smith, Ph.D, Paula J. Burdette, Ph.D, Gregory A. Cheatham, Ph.D, Susan P. Harvey, Ph.D	2016	Parents are unsatisfied with the traditional way of learning for the disabled students, thus authors try to suggest a new way of blended learning (online- brick & motor) for them.	As the study was conducted on a group of students they showed positive signs, thus in future this blended learning can be a more beneficial way of learning for them.	Even in online learning students showed positive signs. Parents first have to establish good communication with the mentors and then they could help their child for online/blended learning.
10	COVID-19 and online teaching in higher education: A case study of Peking University	Wei Bao	2020	As students are not very active in the online mode of learning this paper suggests several ways in which an effective teaching learning process can be established.	More effective ways of teaching such as animated videos, prerecorded video, etc. are a good way to add on all the points that are being made by the author.	Teachers can plan the flow of the lecture and can involve students into classroom activities like surprise tests, quizzes etc.

2.3. Problem definition

While observing the receptionist at various locations whose duty is to collect fees, accepts admissions, clears all the queries, directs new student to their respective classes would be much easier if we remove the manual work which is maintain the excel file and the owner of the classroom asking for specific details for them. With increase in admissions at training institutes, it becomes complicated day by day to manage the stuff manually.

2.4. Feasibility study

As one knows it is the digital era and most of the businesses have online presence and so was the need during the Covid-19 pandemic. So losing contact is not affordable at any circumstances. So one needs to have information of their stakeholders in one or the other form. While training institutes might have faced the issue during the initial stages of pandemic. So the product is believed to have its presence in order to stay connected.

2.5. Methodology used

2.5.1. Agile

We selected this methodology as features required co-ordination among frontend, backend and database schema were interdependent, so we used git technology and we created different branches for this purpose and merged them after successful approval from team mates. With this continuous development we successfully deployed the project.

2.5.2. Customer interaction details

We interacted with Mrs. Nidhi Arora owner of "**AARUSHI CLASSES**" located at Gokuldham, Goregaon East, Mumbai. The institute offers coaching to students of CBSE, ICSE, IB board students. It conducts art and craft, drawing activities for children of young age.

Interaction was done in 2 phase's viz. in the month of September and October 2021. While interaction we also had Mr. Sagar who is a faculty at the mentioned institute. At first we briefed them about our project and what have we planned to do they listened to us patiently and understood our project.

During second interaction they provided us with recommendations to add features such as:

1) List of students in a particular class.
2) Assign a faculty to different subject.
3) Invitation via email to all the parents.

4) Weekly tests are being conducted at our institute so, weekly topper details to be viewed in the application.

2.6. Summary

Literature survey enabled us to build web applications which are not required and which will ease the work of administrators or the owners who run the institute on minimal resources. Agile methodology best suited the demands aligned from the customer interaction details. Customer interaction broadened our scope and gave us the scope to add new features in our project which will reduce mundane tasks.

Chapter 3. Analysis & Planning

3.1. Introduction

Master class a web application which is developed using node js, express js as backend technology handlebars as frontend rendering engine and MySQL community server for relational database. We have used Canva an online graphics tool to generate beautiful images, gif so as to make our website more attractive. Git one of the best community supported version control system is being utilized in our project at a large scale.

3.2. Project planning

Phase 1: July 2021 – November 2021

a. Problem identification

b. Literature survey

c. Customer interaction

Phase 2: January 2022 – April 2022

a. Database schema design

b. Graphics designing

c. Development (Frontend, backend, database configuration)

d. Testing (Unit, integration, deployment)

e. Preparation of black book

3.3. Scheduling

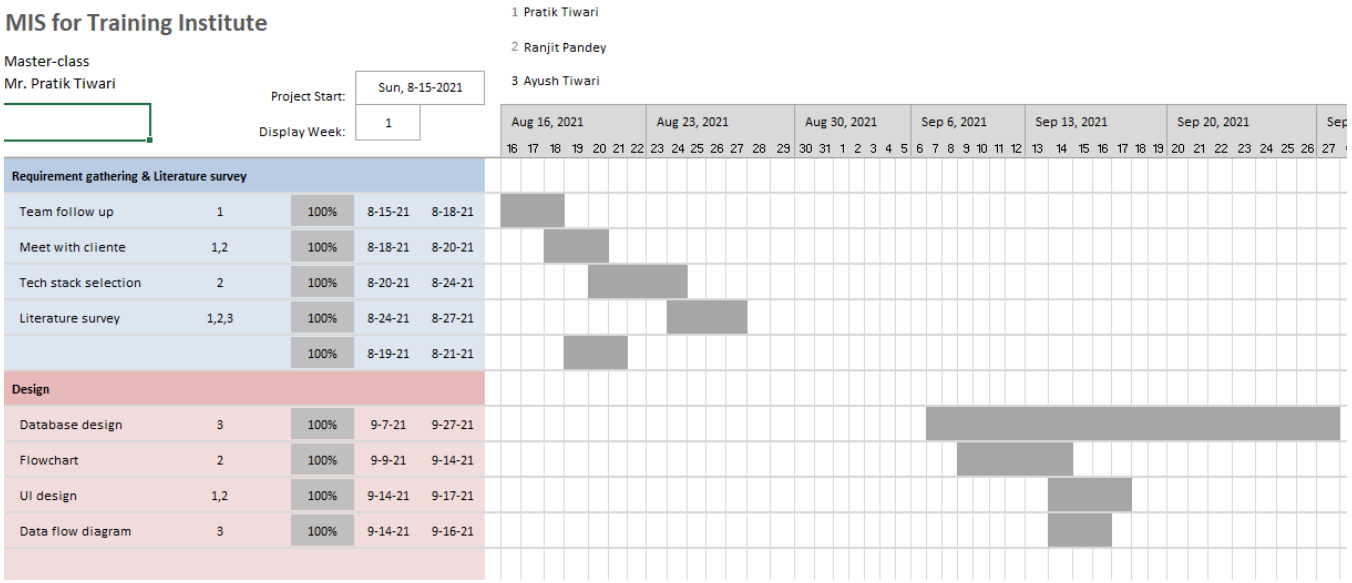

Figure 3.1: Gantt chart phase 1

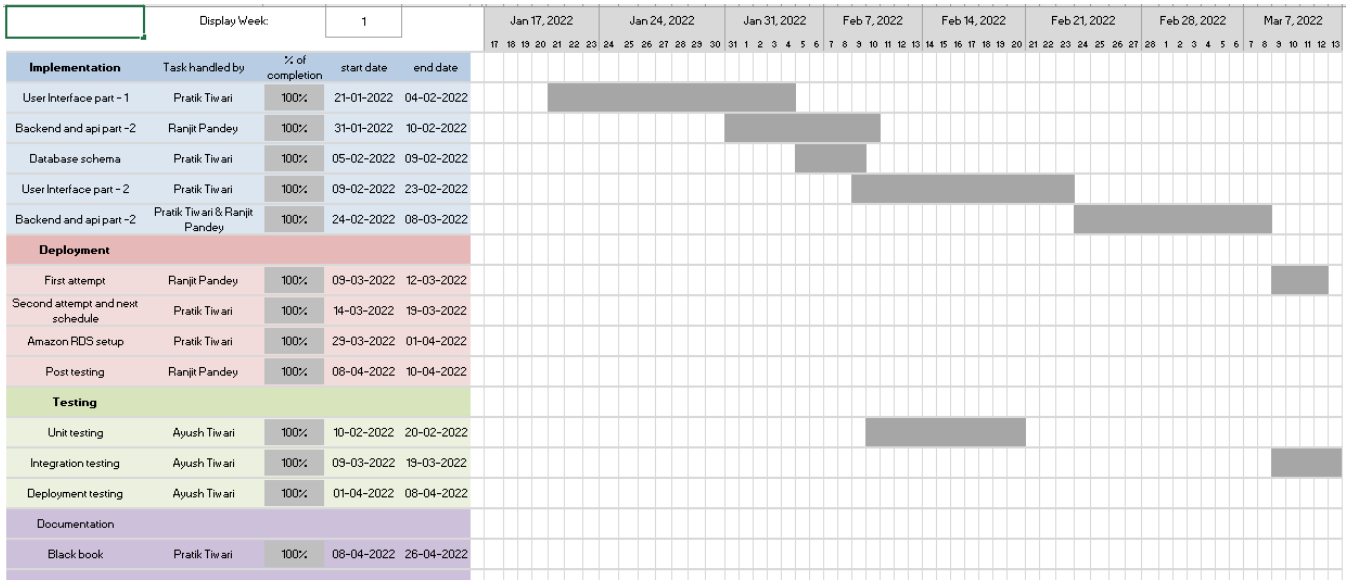

Figure 3.2: Gantt chart phase 2 - part 1

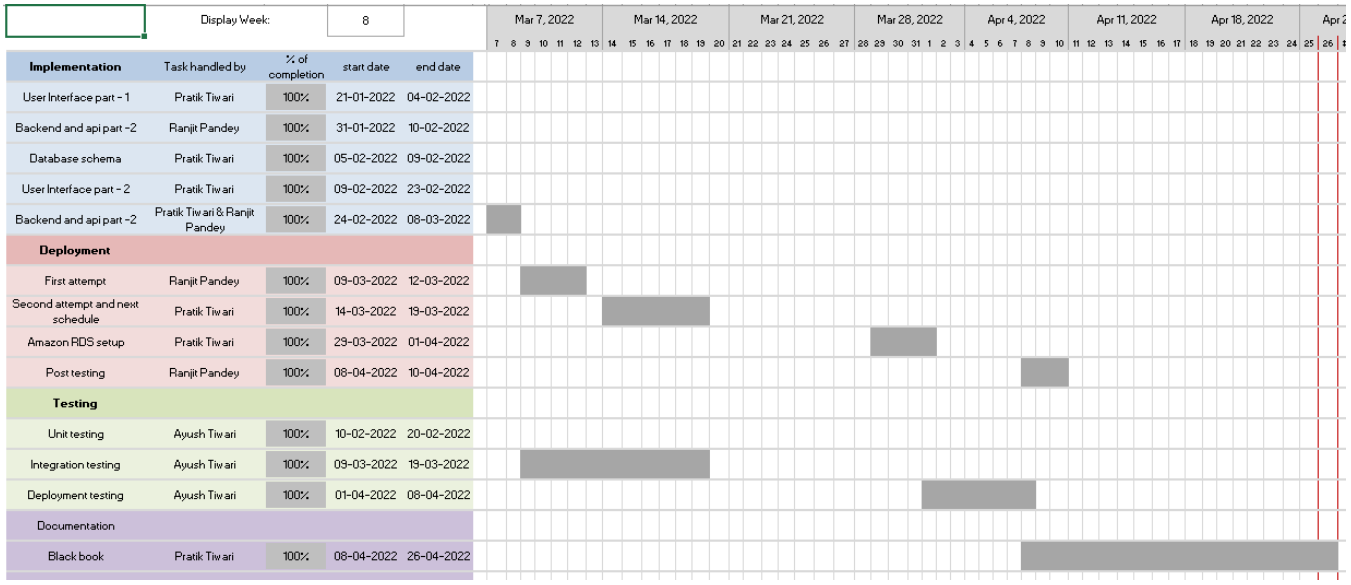

Figure 3.3: Gantt chart phase 2 - part 2

3.4. Summary

Planning is a crucial part of any project, the one with expected outcomes, proper steps are to be taken from the start of the project to avoid any blunder at the end. Use of version control system ensures any risk or damage to the device where development takes place is covered, we can remotely clone the project whenever required and our work remains the same. Gantt chart helps us to be on track and complete the required task as planned to avoid overhead.

Chapter 4. Design And Implementation

4.1. DFD

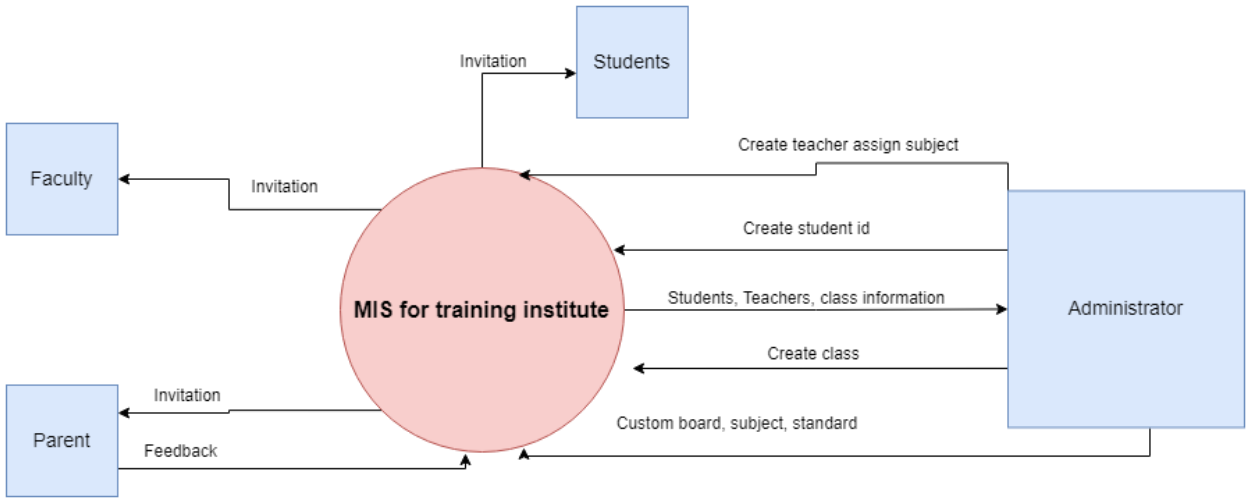

Figure 4.1: DFD Level 0

The shown figure is Level 0 DFD of the system that is created, this figure gives us a general overview of how data will be flown from module to different modules in the system.

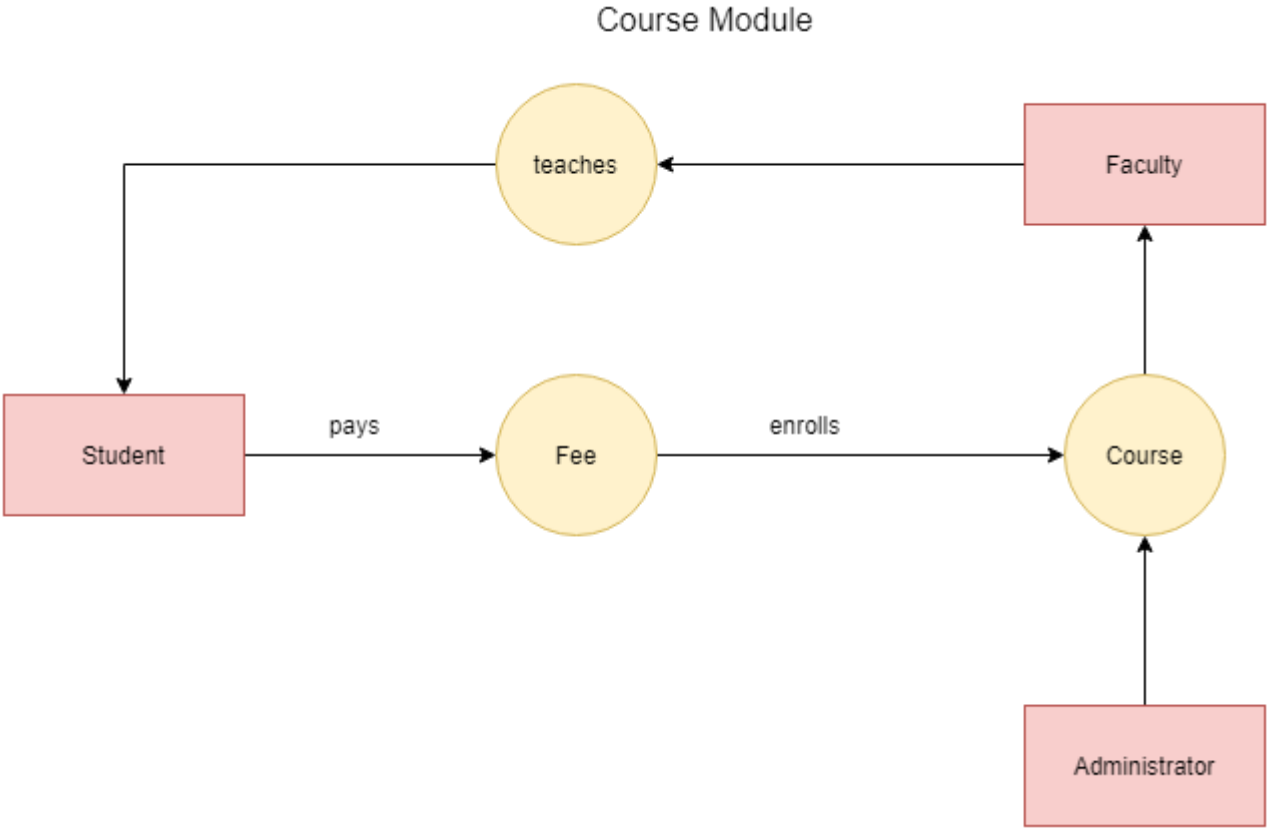

Figure 4.2: DFD level 1

The above image demonstrates the data flow from administrator viz. add course / class ,assigns it to a teacher or multiple and some students are enrolled into it.

4.2. Flowchart

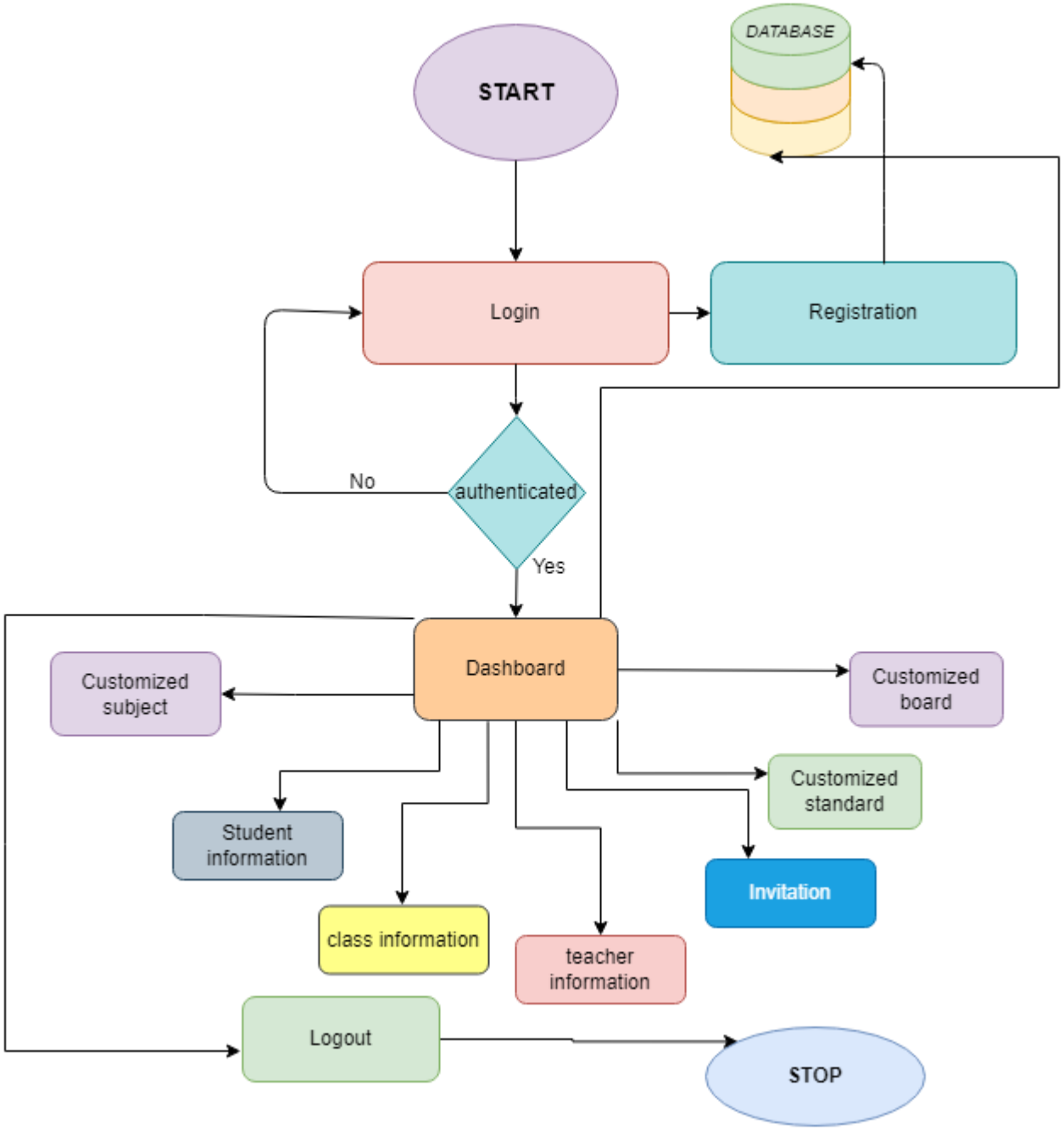

Figure 4.3 Flowchart for administrator

Above figure shows us the flowchart of the system, in general terms it tells us what function will be performed after completing the current process

4.3. Database

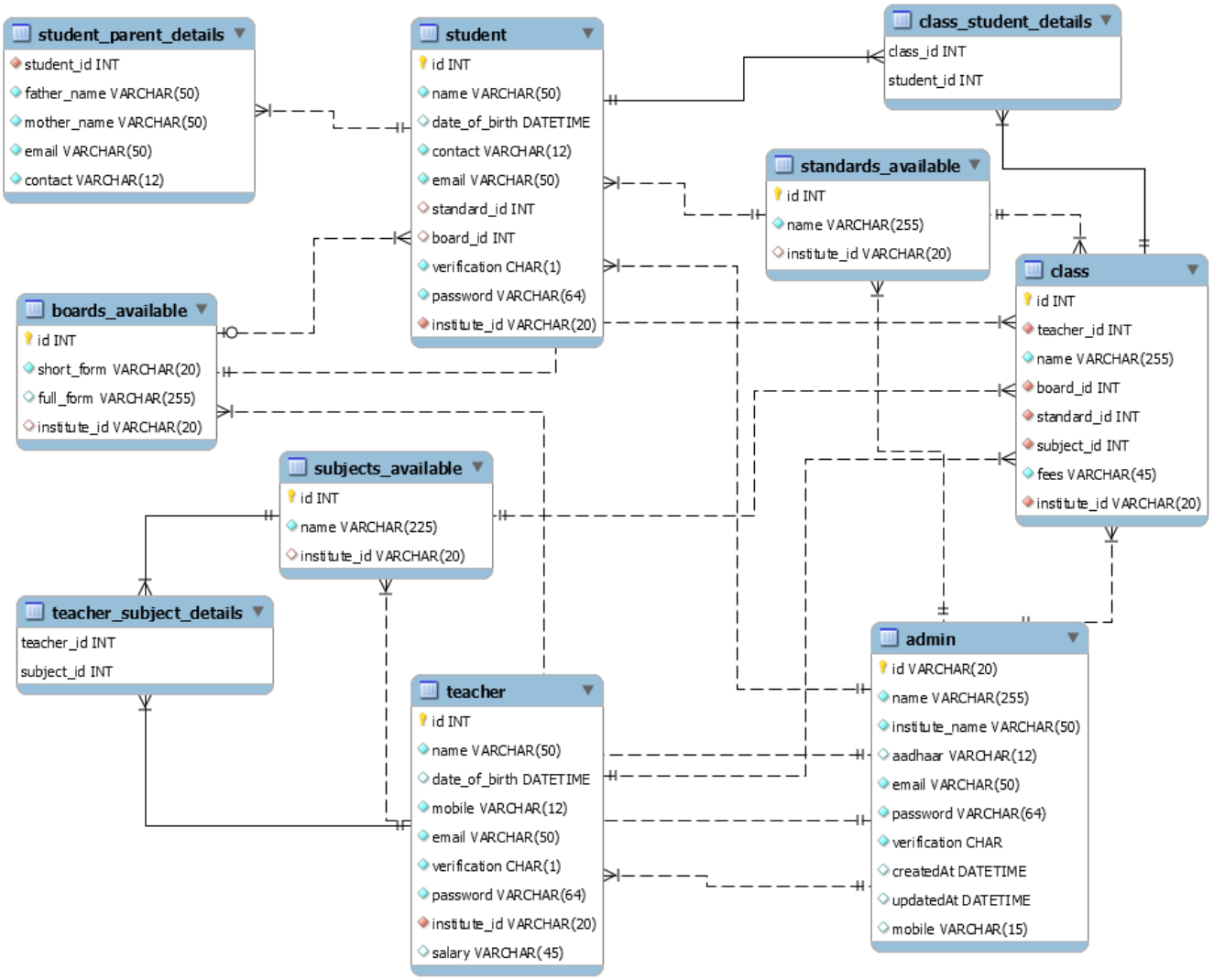

Figure 4.4: Database schema (MySQL)

The image shown above is the Extended Entity Relation (ERR) Diagram, this image shows us how the tables are related to each other as it is a relational database

id	name	institute_name	aadhaar	email	password	verification	createdAt
bmvpt3312g	Pratik Tiwari	Pratik classes	123456789009	pratiktiwari2001@gmail.com	[redacted]	1	2022-03-30 05:59:00
ERP1234561	ranjeet	TCET	535667831074	ranjeet112pandey@gmail.com	[redacted]	1	2022-03-25 07:01:35
ERP1234567	ranjit pandey	thakur	535667831075	ranjit112pandey@gmail.com	[redacted]	0	2022-03-25 07:09:08
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Figure 4.5: Values from admin table

The image displays institute's registered on the platform with basic information of the institute.

id	teacher_id	name	board_id	standard_id	subject_id	fees	institute_id
16	33	class 6 chemistryy	3	11	4	2000	ERP1234561
17	33	class 7 biology	3	2	1	2000	ERP1234561
18	34	class 9 geography	14	3	9	3000	ERP1234561
28	43	class 10 English	32	25	19	3000	bmvpt3312g
29	33	class 7 english	3	2	5	5000	ERP1234561
30	41	class 10 - geography	32	25	11	3000	bmvpt3312g
31	41	class 10 - chemistry	32	25	10	3000	bmvpt3312g
32	37	class 10 - arts	32	25	16	2000	bmvpt3312g
33	37	class 9 - biology	32	12	20	2000	bmvpt3312g
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Figure 4.6 Value from Class table

A class has a board, student, subject and a teacher ideally teaches a class with fees as mentioned for the each class.

id	name	mobile	email	institute_id	salary
33	Pratik Tiwarii	7506405495	pratiktiwari2001@gmail.com	ERP1234561	30000
34	Arya Tiwari	8369130319	aryatiwari2003@gmail.com	ERP1234561	23000
37	Arya Shukla	8369130320	aryu.me07@gmail.com	bmvpt3312g	25000
38	Pratik Dubey	9869760179	s1032180256@gmail.com	bmvpt3312g	25000
41	Pratik Tiwari	7506405496	teestgmaail2@gmail.com	bmvpt3312g	30000
43	Nidhi Arora	7506405497	tiwari.manvi@yahoo.co.in	bmvpt3312g	20000
NULL	NULL	NULL	NULL	NULL	NULL

Figure 4.7 Teachers created by the administrators

A list of teachers created with their id being utilised for subject allocation and teacher payment.

id	short_form	full_form	institute_id
1	CBSE	Central Board of Secondary Education	ERP1234561
2	SSC Maharashtra	State board of Maharashtra	ERP1234561
3	ICSE	INDIAN CERTIFICATE OF SECONDARY EDUCAT...	ERP1234561
4	CBSE2	Central Board of Secondary Education2	ERP1234561
13	SSC2	State board 2	ERP1234561
14	SSC	State board of Maharashtra	ERP1234561
32	CBSE	Central board of Secondary education	bmvpt3312g
34	UPPSC	UTTAR PRADESH	bmvpt3312g
35	MPSC	MADHYA PRADESH STATE BOARD	bmvpt3312g
NULL	NULL	NULL	NULL

Figure 4.8 Custom boards created by various institutes

Classes at an institute have boards associated with it which further help in student enrolment for specific subjects being taught at an institute. As it is fully customizable, no pre-defined boards. Here, each institute can have same board we have used composite key concept to achieve the same.

id	standard_name	institute_id
25	10	bmvpt3312g
9	10	ERP1234561
10	6	bmvpt3312g
11	6	ERP1234561
2	7	ERP1234561
21	8	bmvpt3312g
1	8	ERP1234561
12	9	bmvpt3312g
3	9	ERP1234561
5	arts	ERP1234561
7	drawing	ERP1234561
24	XI	bmvpt3312g

Figure 4.9 Standard name table

Plays important role in student id creation, teacher id creation and class creation

id	subject_name	institute_id
16	ARTS	bmvpt3312g
20	Biology	bmvpt3312g
1	Biology	ERP1234561
10	CHEM	bmvpt3312g
4	Chemistry	ERP1234561
19	English	bmvpt3312g
5	English	ERP1234561
11	Geography	bmvpt3312g
9	Geography	ERP1234561
3	physics	ERP1234561
NULL	NULL	NULL

Figure 4.10 Custom subjects available

It also plays important role in student id creation, teacher id creation and class creation

id	student_name	contact	email	standard_id	board_id	institute_id
1	Pratik Tiwari	7506405495	pratiktiwari2001@gmail.com	9	1	ERP1234561
7	Pratik Tiwari student	7506405496	pratik.tiwari3@gmail.com	12	32	bmvpt3312g
8	Ranjit Pandey	7303002608	ranjeet112pandey@gmail.com	25	32	bmvpt3312g
13	Pratik Tiwari tcet	7506405497	1032180256@tcetmumbai.in	25	32	bmvpt3312g
NULL	NULL	NULL	NULL	NULL	NULL	NULL

Figure 4.11 Student table from all the institutes

Students table has relations with standard, board, and institute id's so as to properly assign to a particular class and complementarily is assigned to a teacher.

class_id	student_id
17	1
28	8
29	1
30	13
31	8
31	13
32	8
33	7

Figure 4.12 class-student table

This table is responsible for student's enrolment to the class and so gives the administrator a proper view of it.

student_id	father_name	mother_name	email	contact
1	Parshuram	Rami	1032180848@tcetmumbai.in	9892417974
7	Sunil	Neelam	s1032180256@gmail.com	9324071759
8	Parshuram	Rami	1032180848@tcetmumbai.in	9892417974
13				

Figure 4.13 Parent details of a student

Parent details are stored in a different table to reduce complexity while querying tables.

teacher_id	subject_id
33	1
33	4
33	5
34	9
37	10
37	16
37	19
37	20
38	10
41	10

Figure 4.14 Teacher-subject table

This table keeps track of teacher assigned to a particular subject, so indirectly assigned to a class created by the administrator.

Chapter 5. Result & Discussion

5.1. Actual Results

5.1.1. Outputs

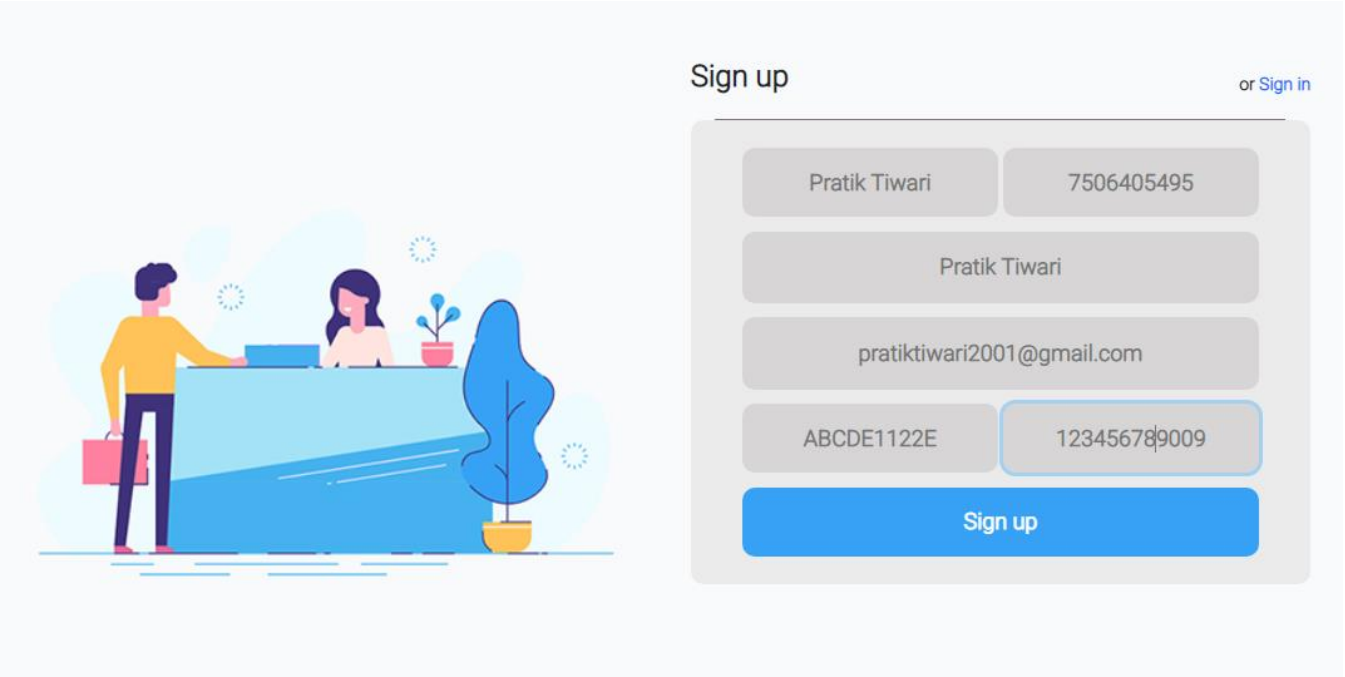

Figure 5.1 Registration screen for the administrator

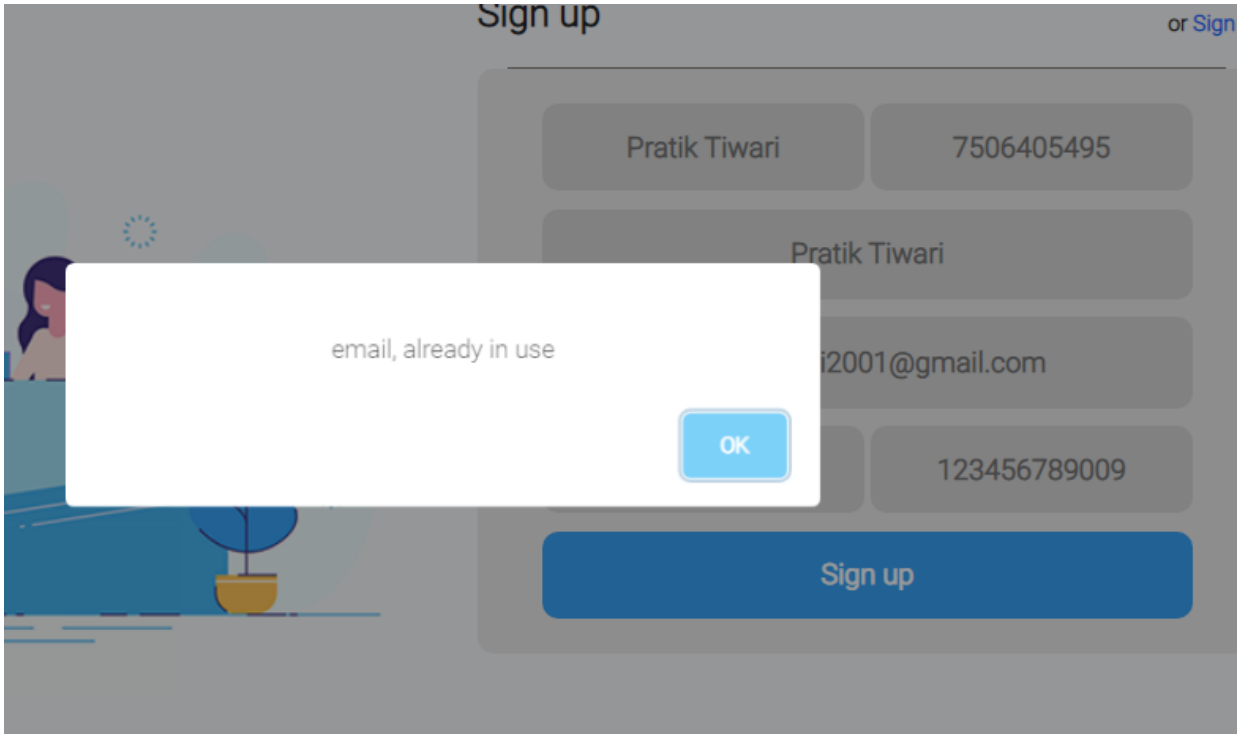

Figure 5.2 alert box (sweet alert)

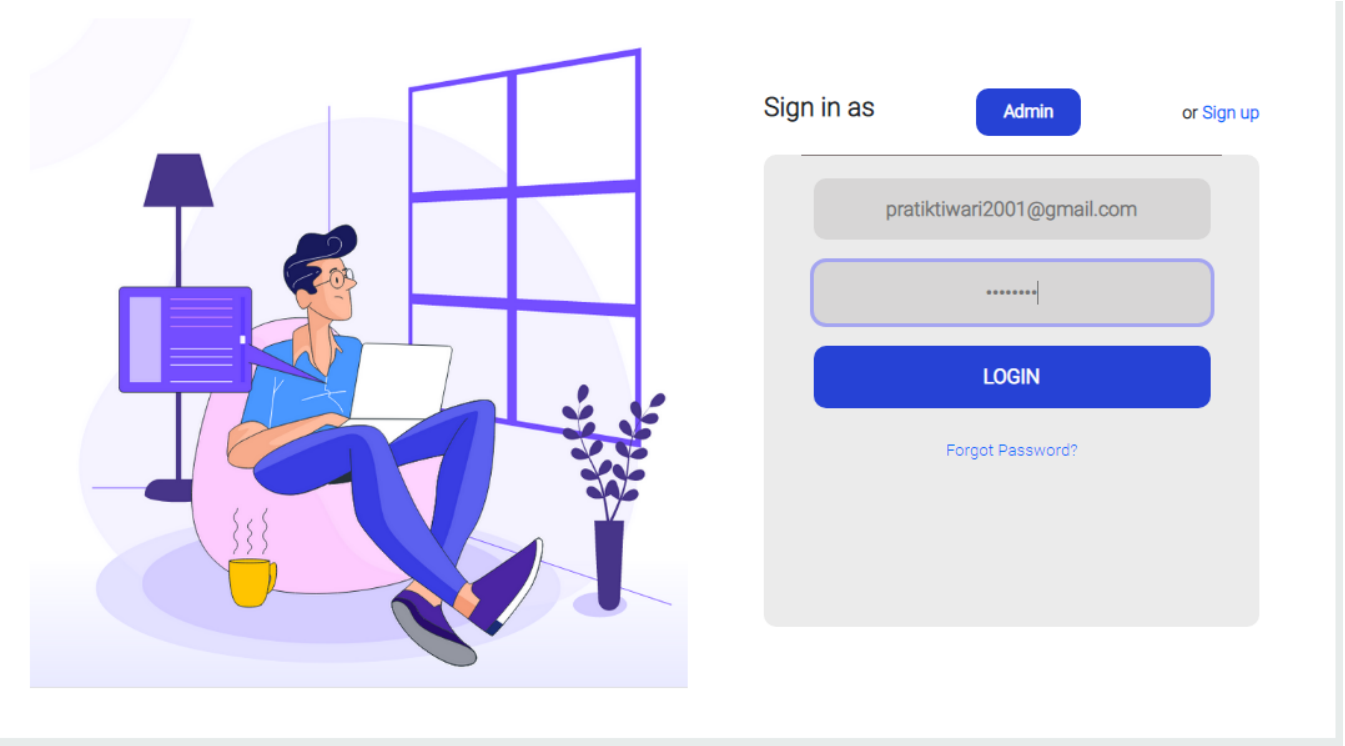

Figure 5.3 Login screen for the administrator

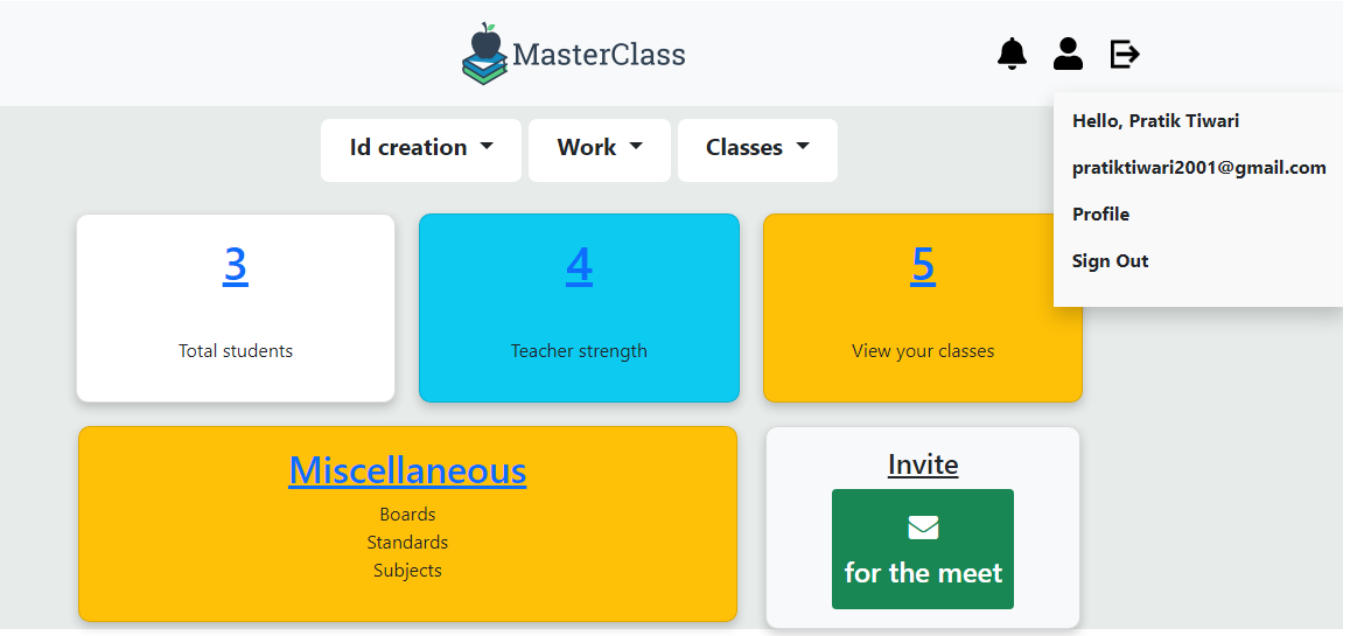

Figure 5.4 Dashboard view for the administrator

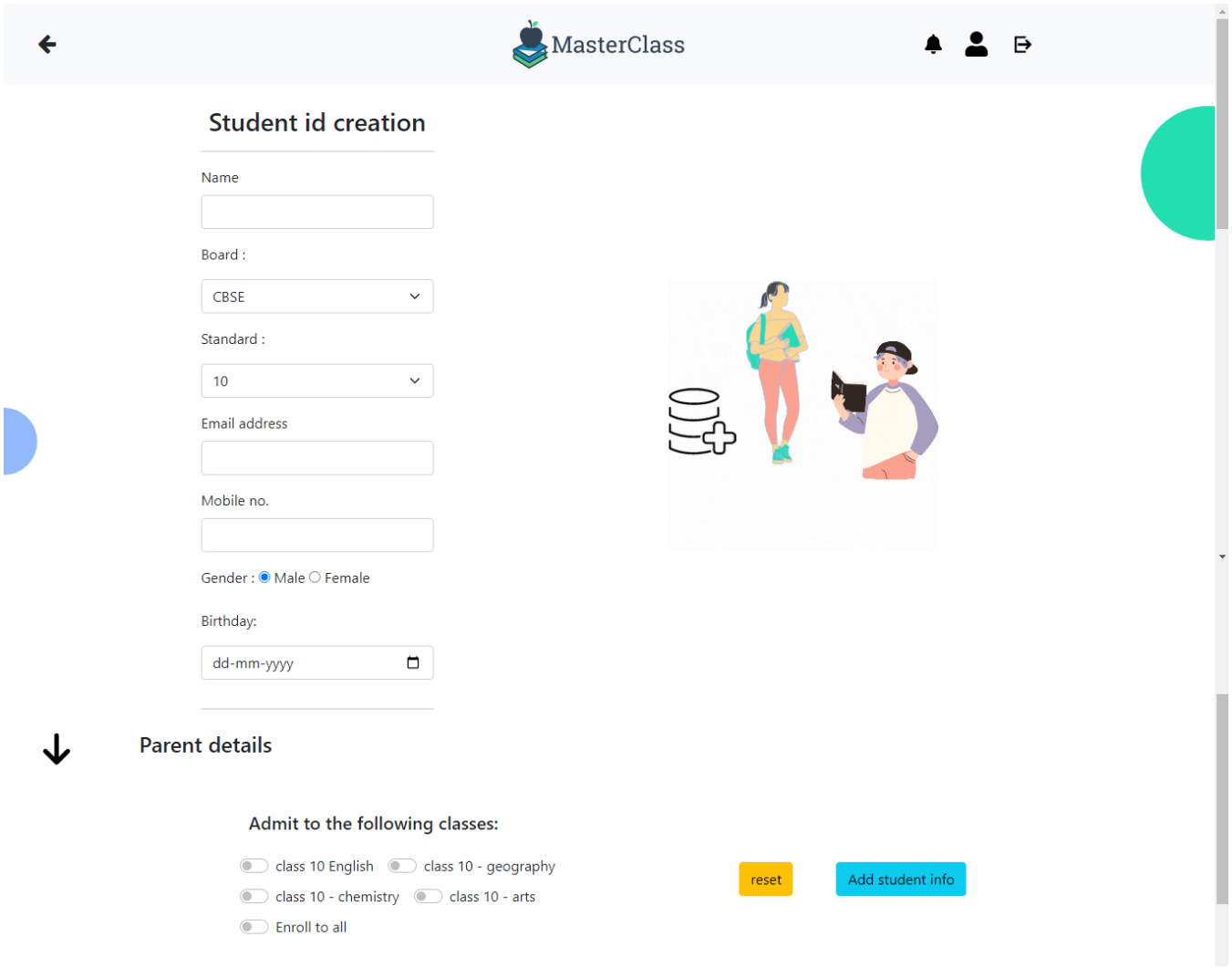

Figure 5.5 Student id creation

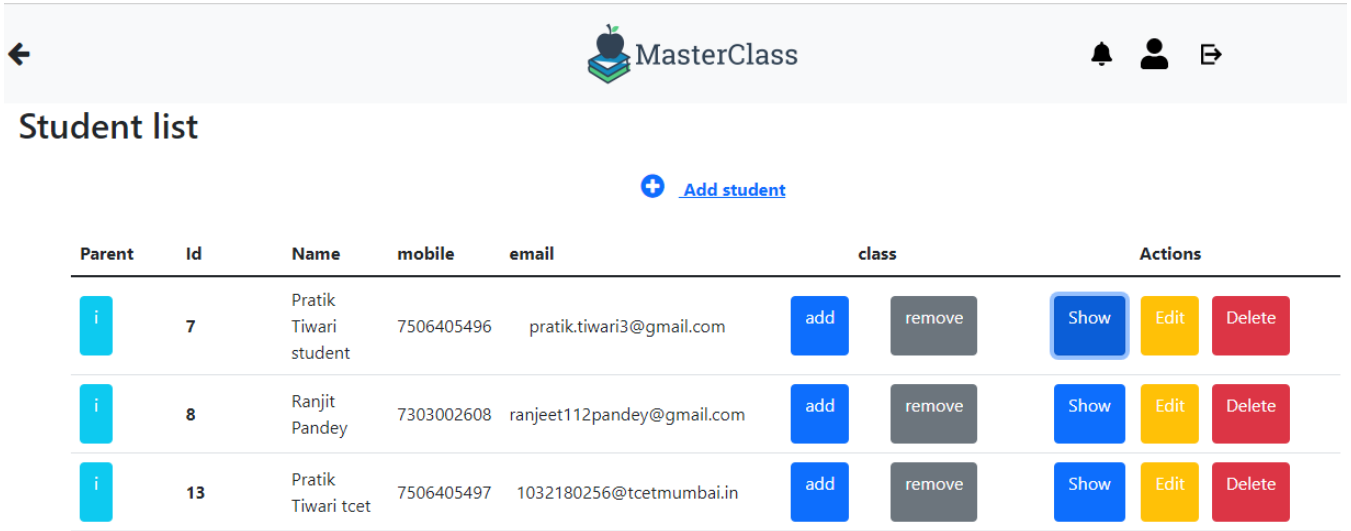

Figure 5.6 List of students

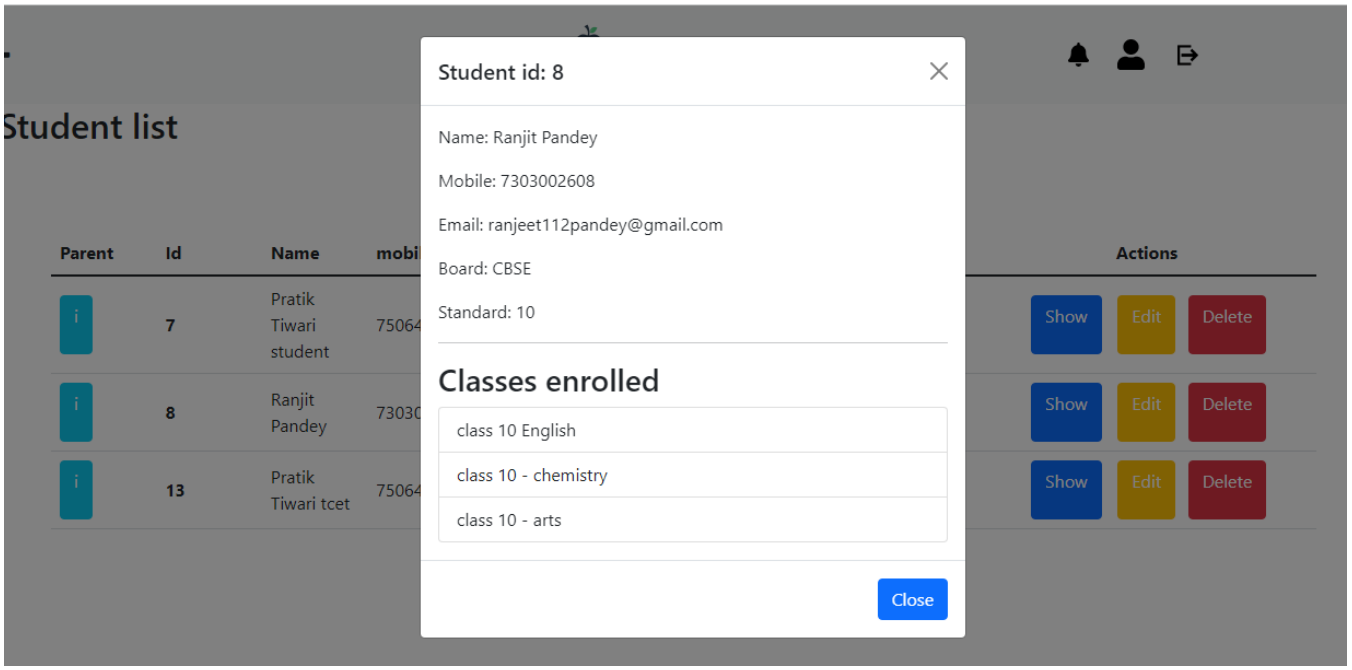

Figure 5.7 Student enrolled to classes

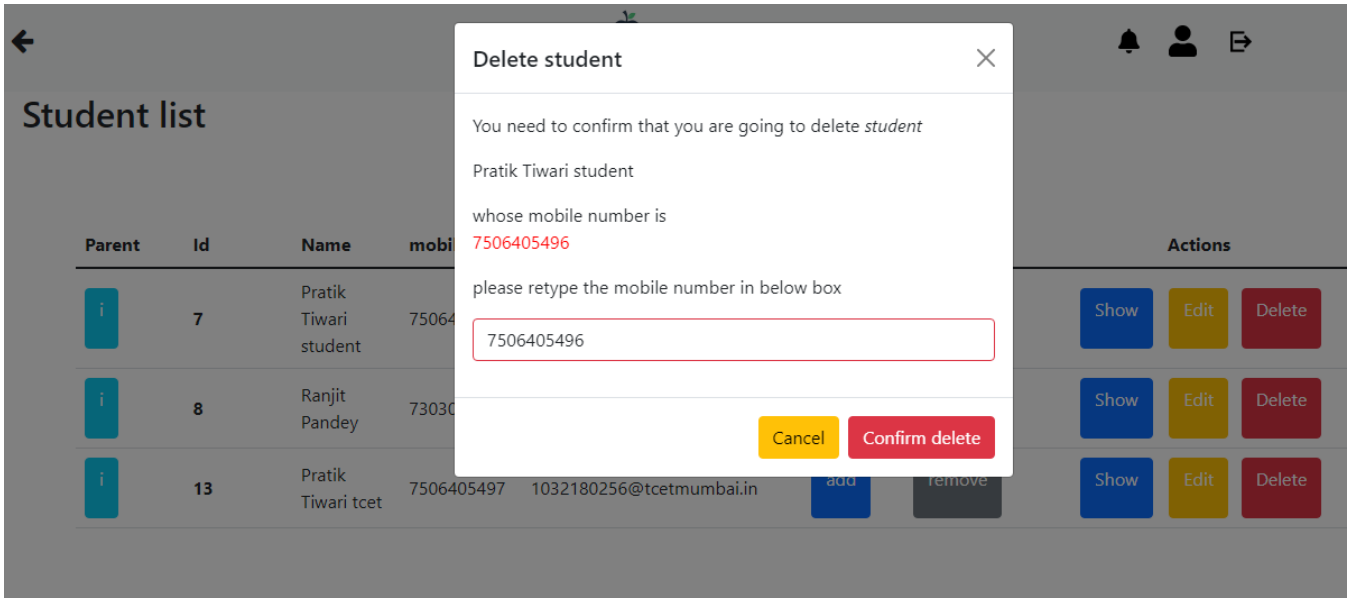

Figure 5.8 Delete student view

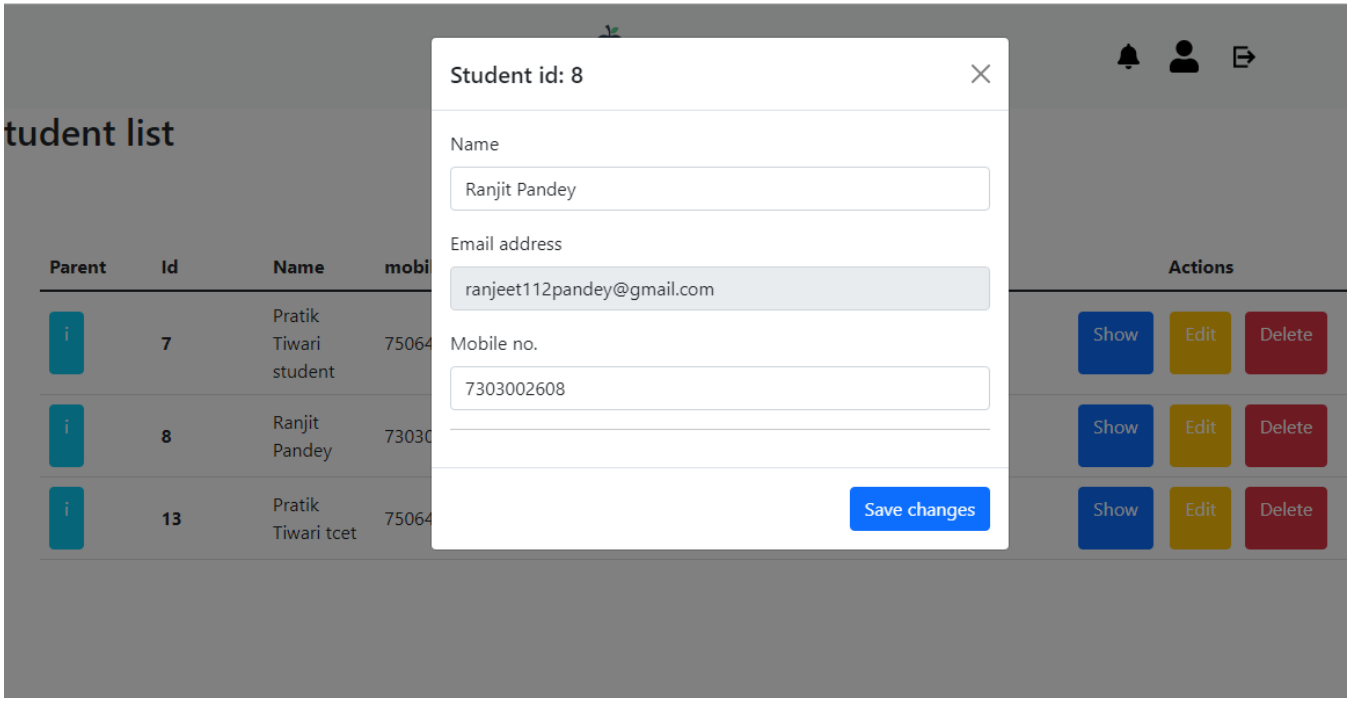

Figure 5.9 Edit student details view

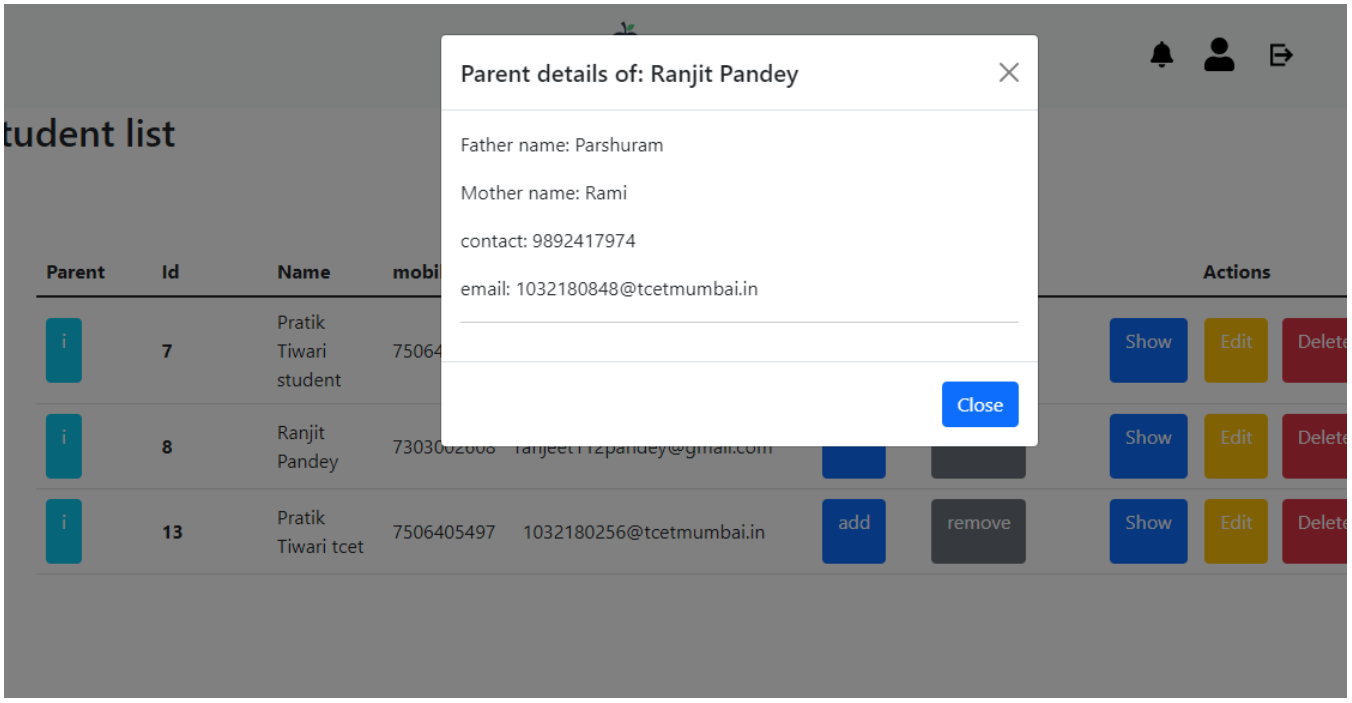

Figure 5.10 Parent details of a student

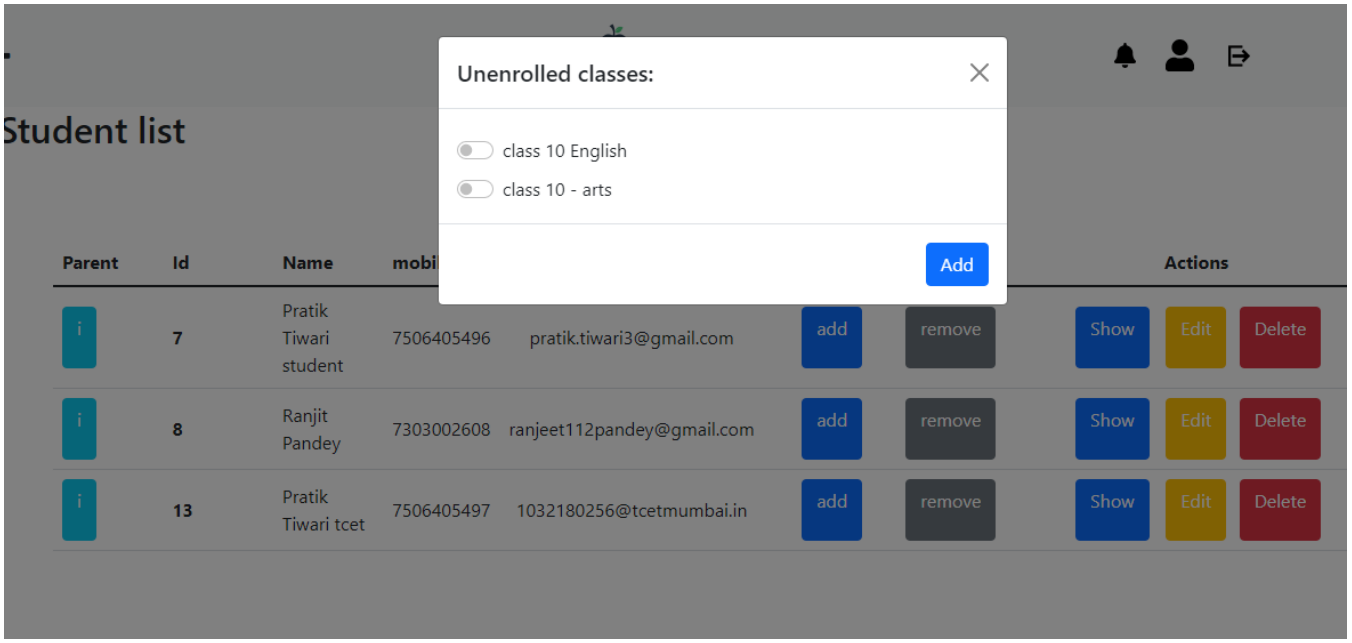

Figure 5.11 List of un-enrolled classes

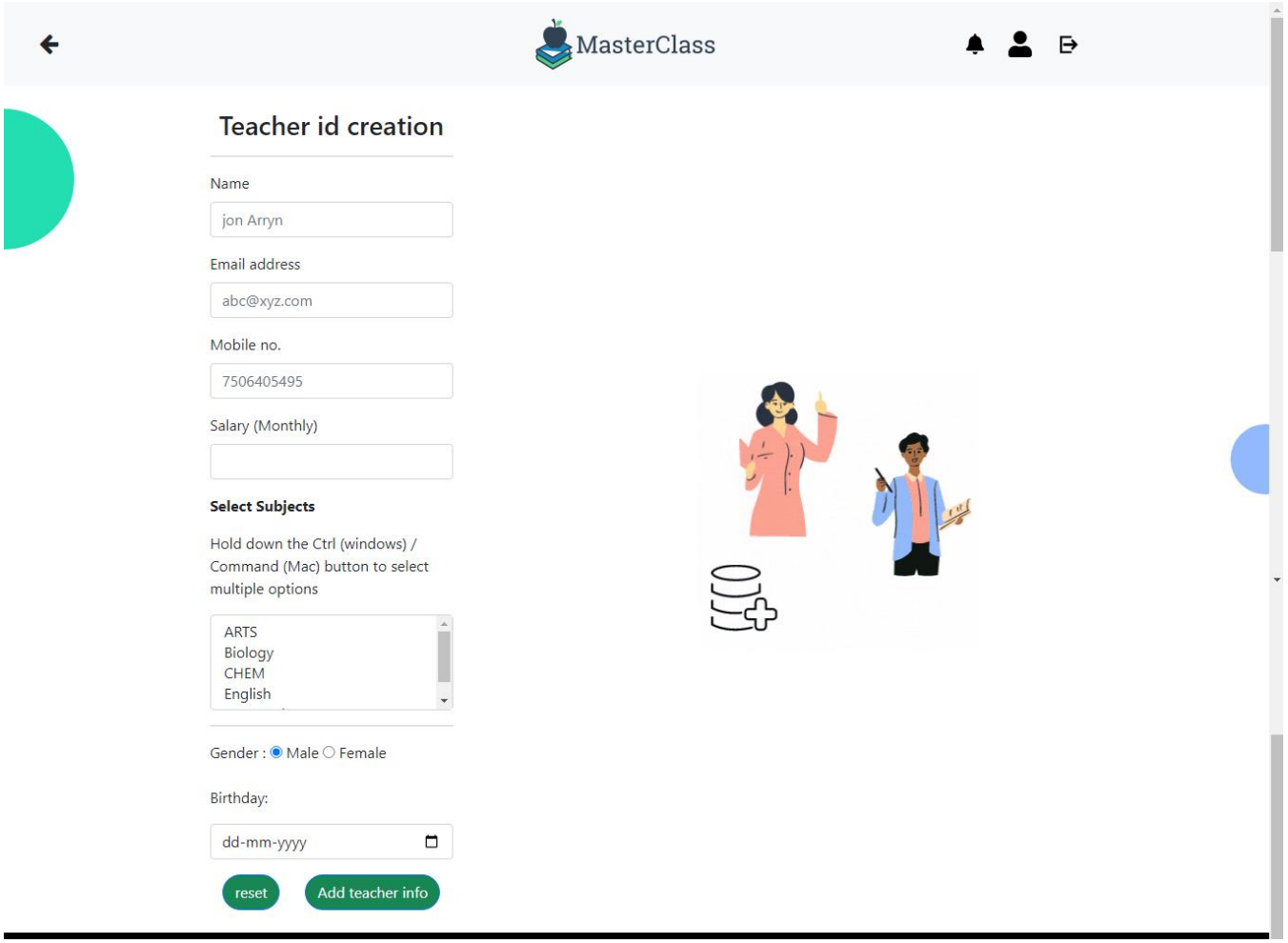

Figure 5.12 Teacher id creation

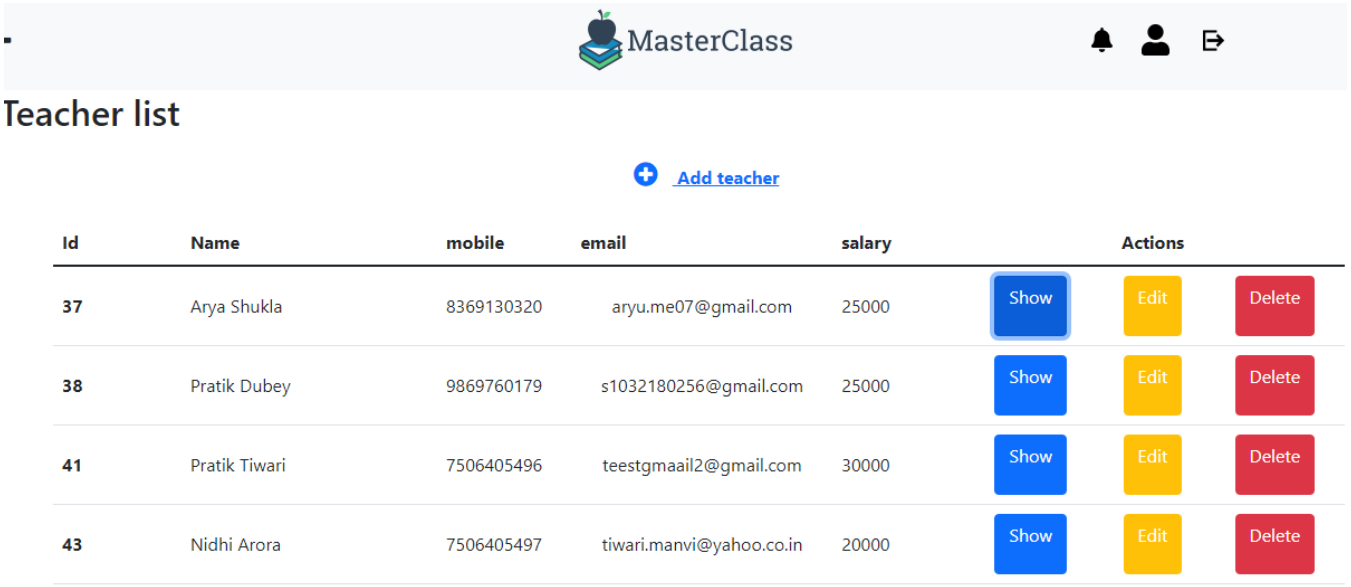

Figure 5.13 List of teachers

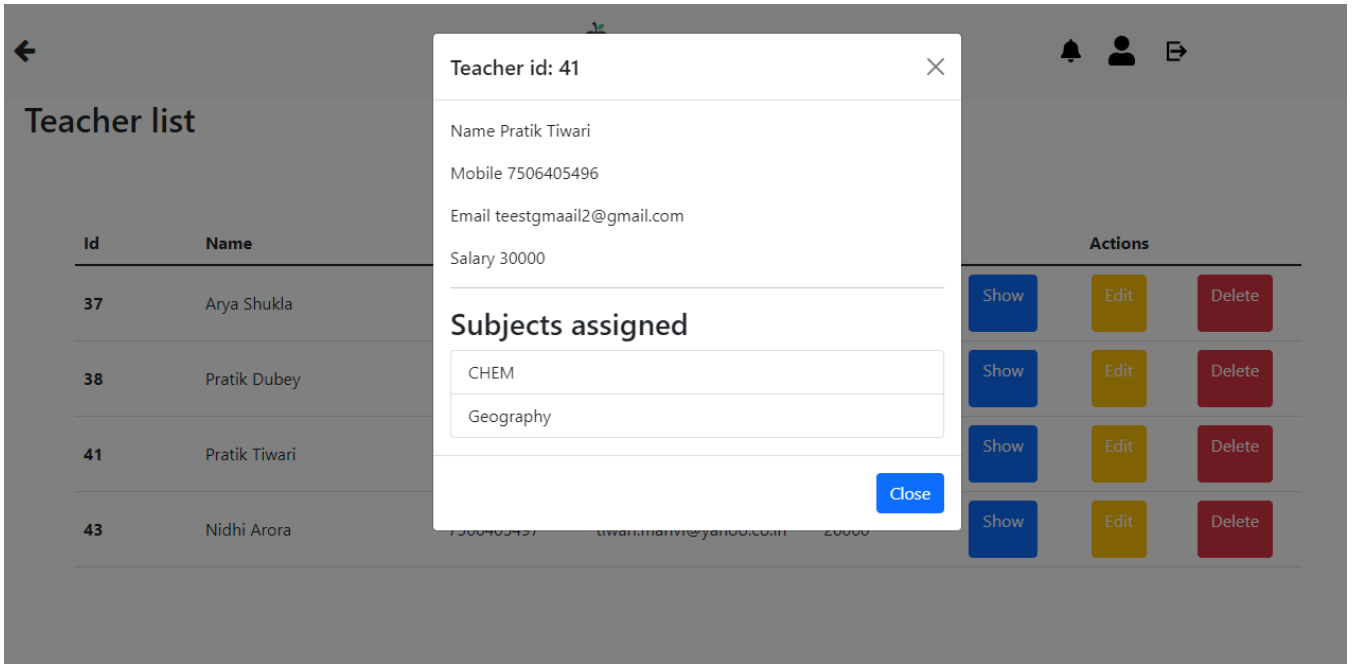

Figure 5.14 Subjects assigned to a teacher

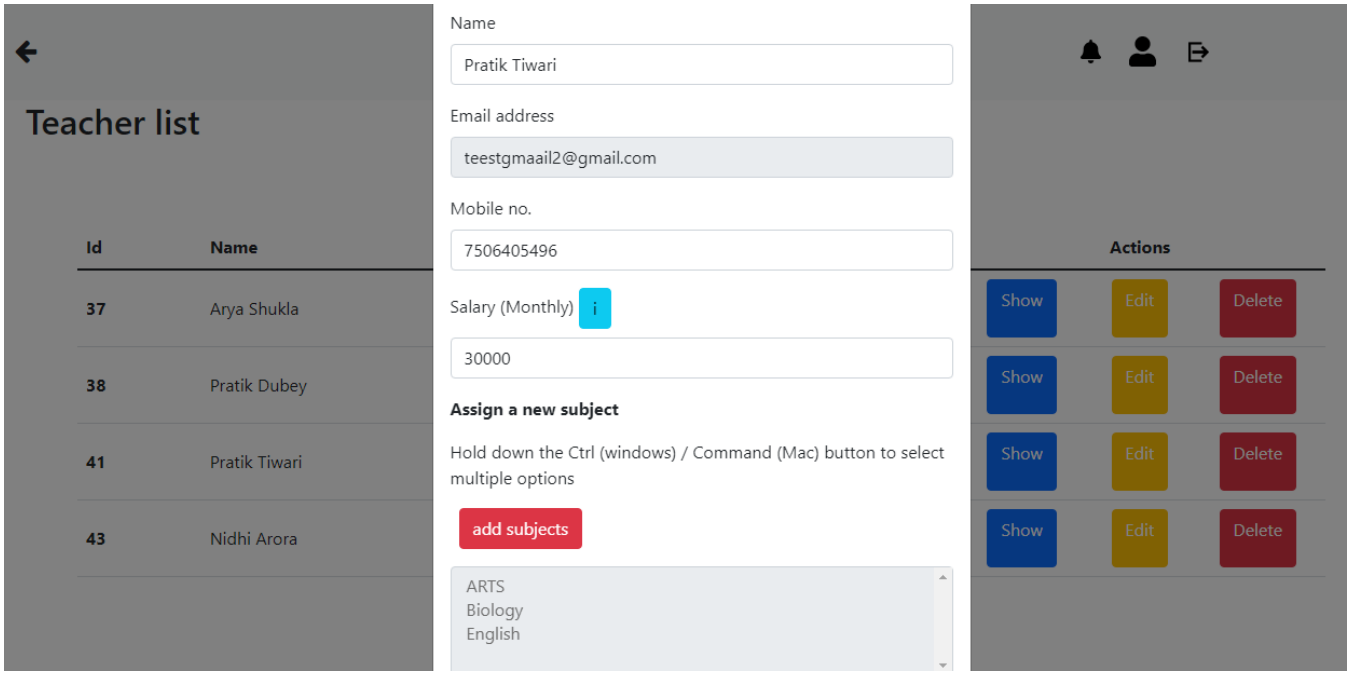

Figure 5.15 Edit teacher information

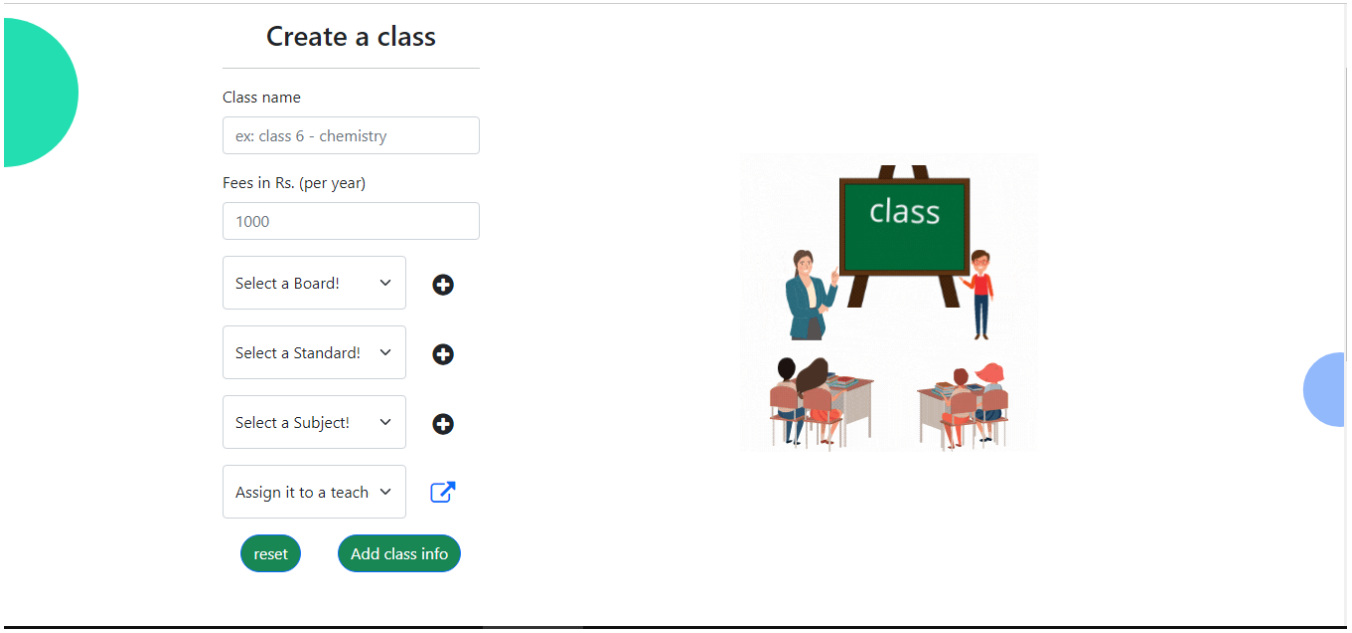

Figure 5.16 Creation of a class

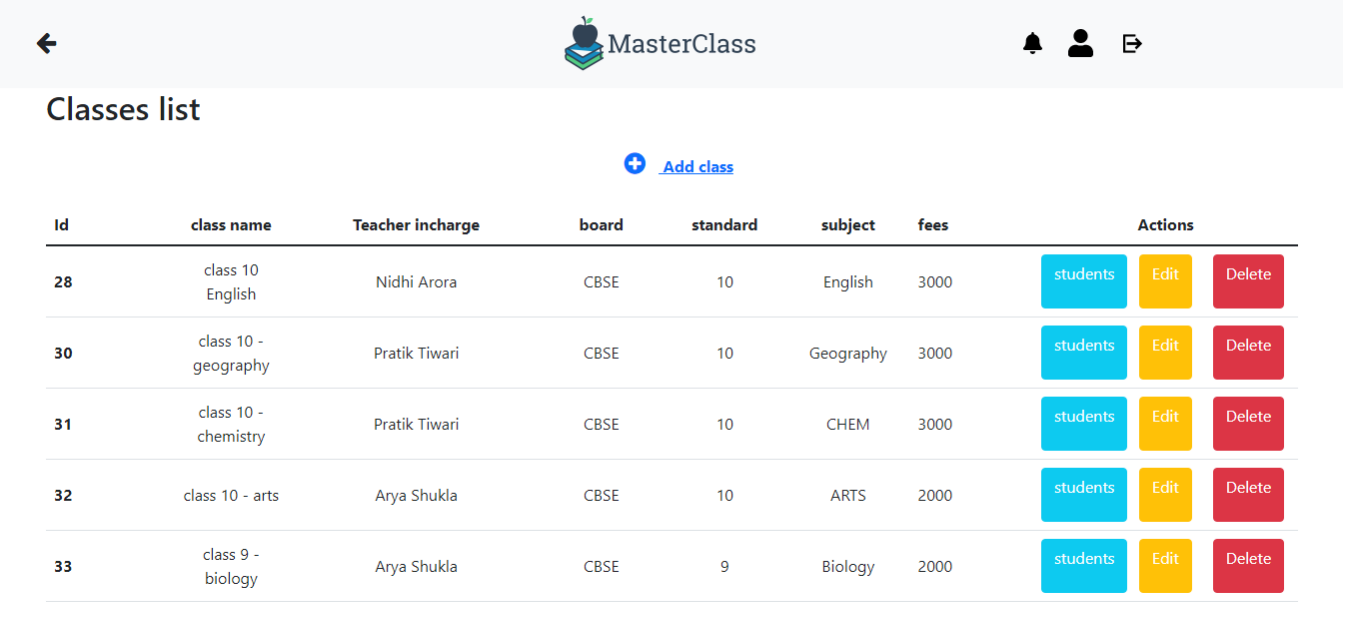

Figure 5.17 List of classes

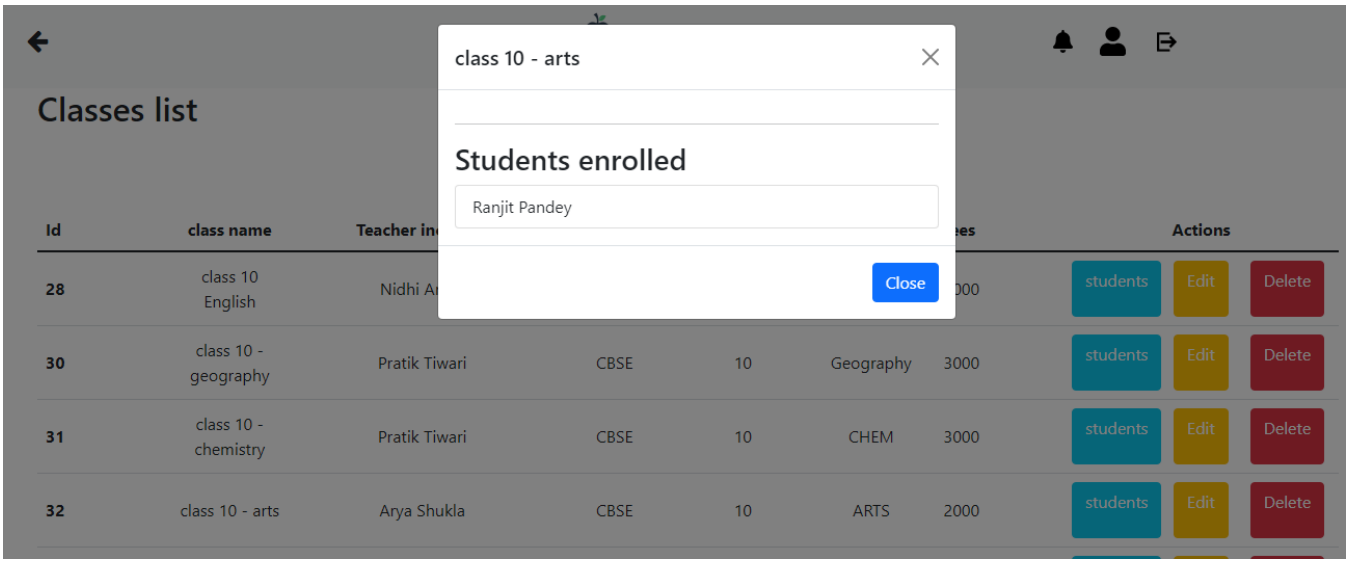

Figure 5.18 List of enrolled students

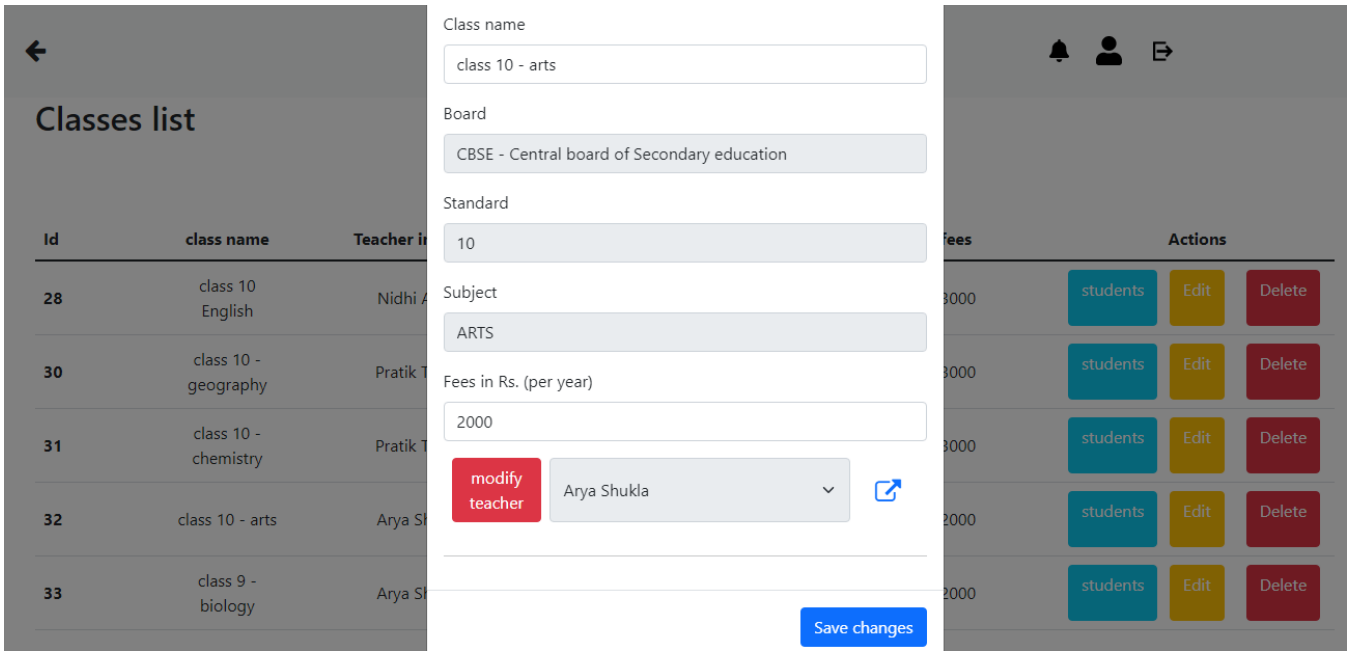

Figure 5.19 Edit class- assign new teacher

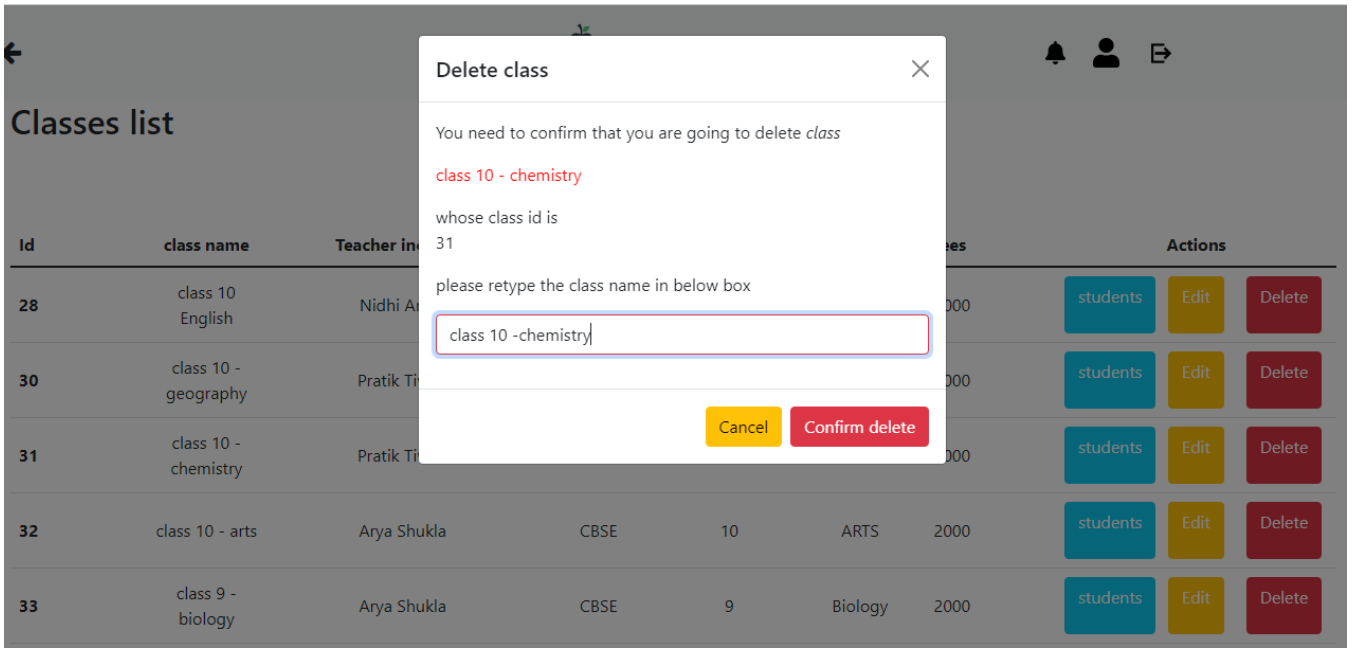

Figure 5.20 Delete a class

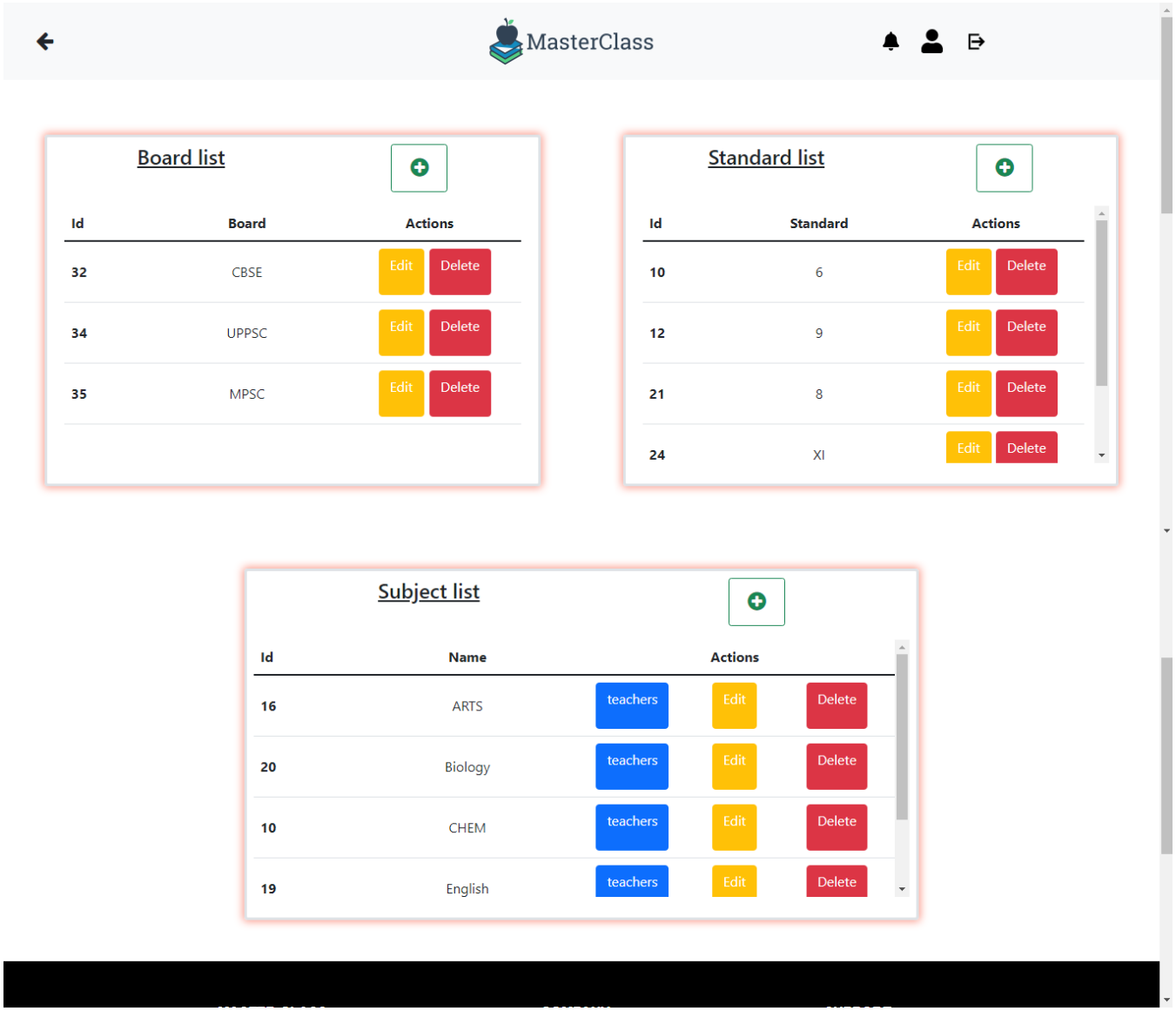

Figure 5.21 Custom board, standard and subject view

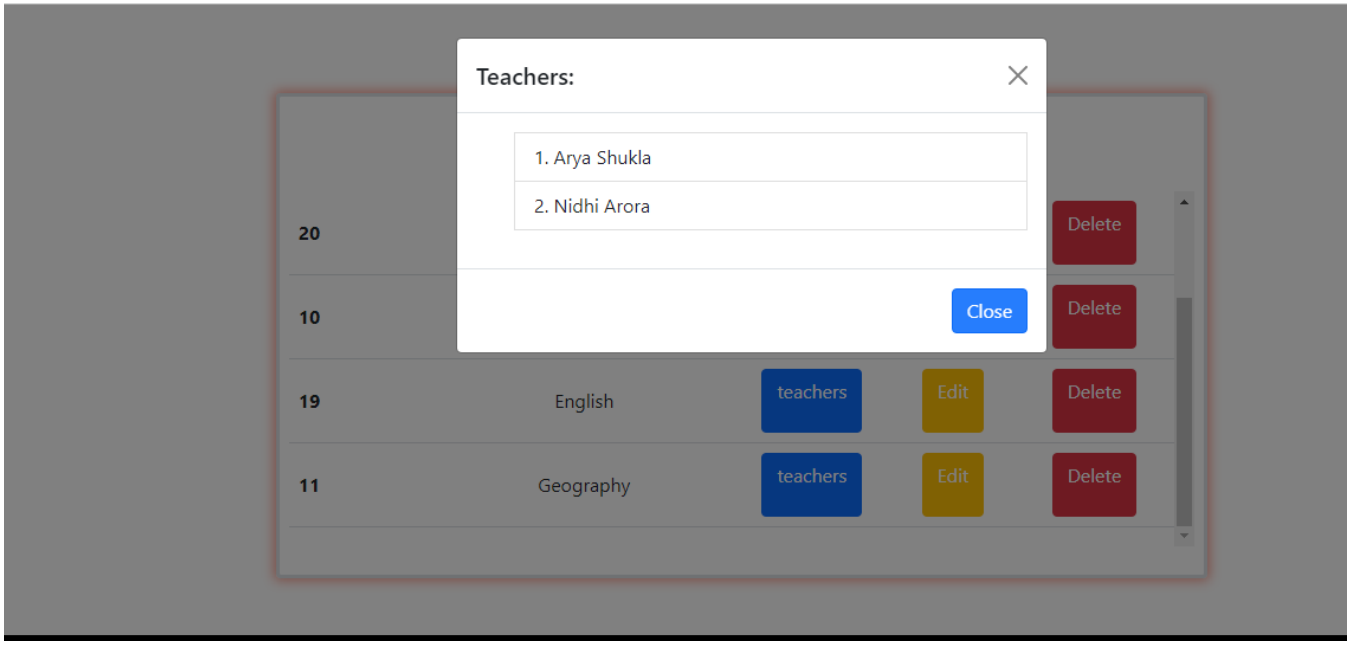

Figure 5.22 Teachers allotted a particular subject

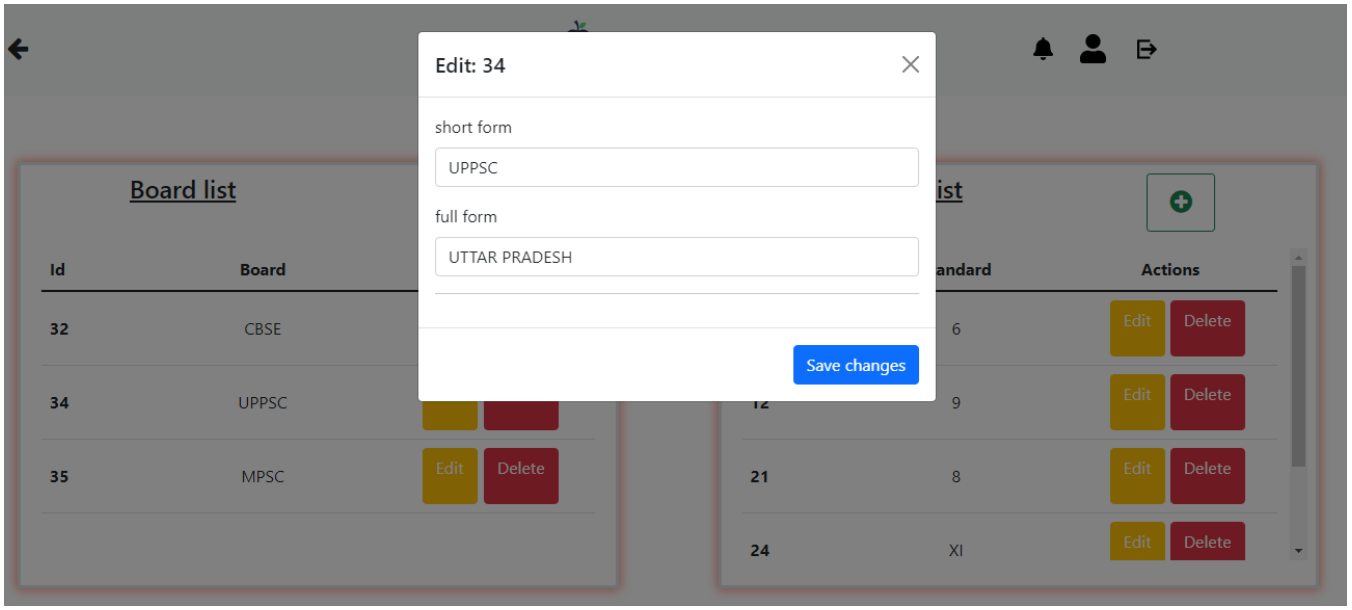

Figure 5.23 Editing a custom board value

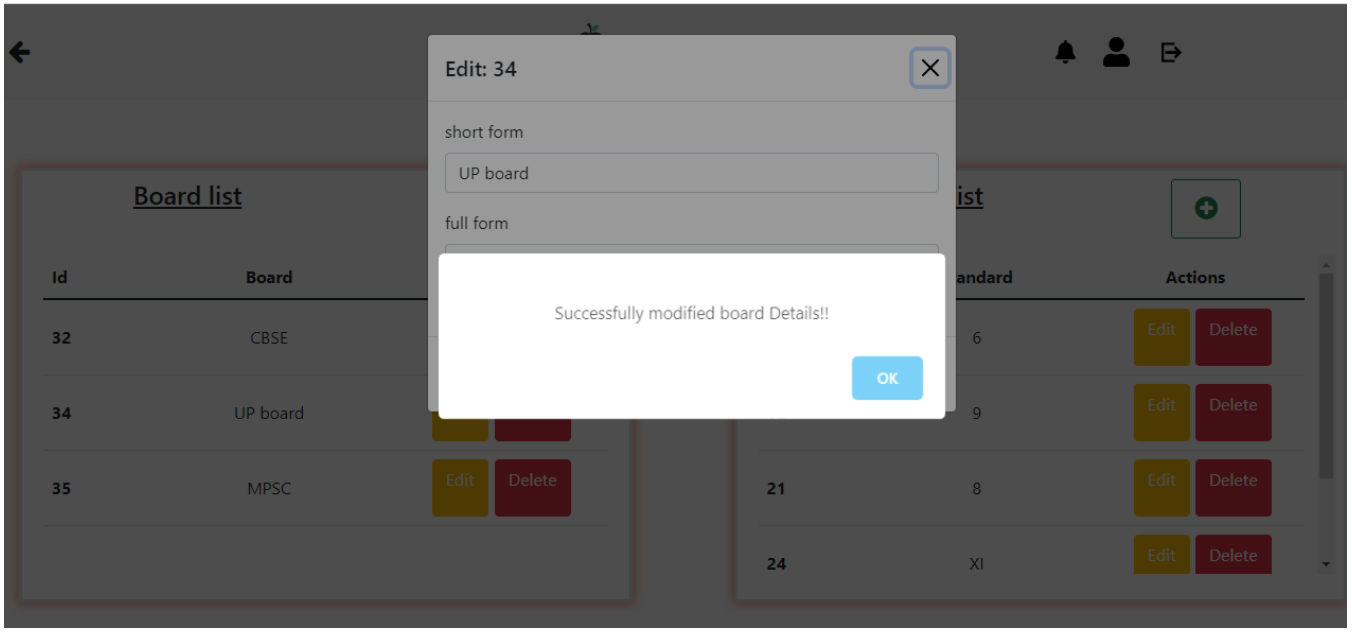

Figure 5.24 Confirmation of custom board

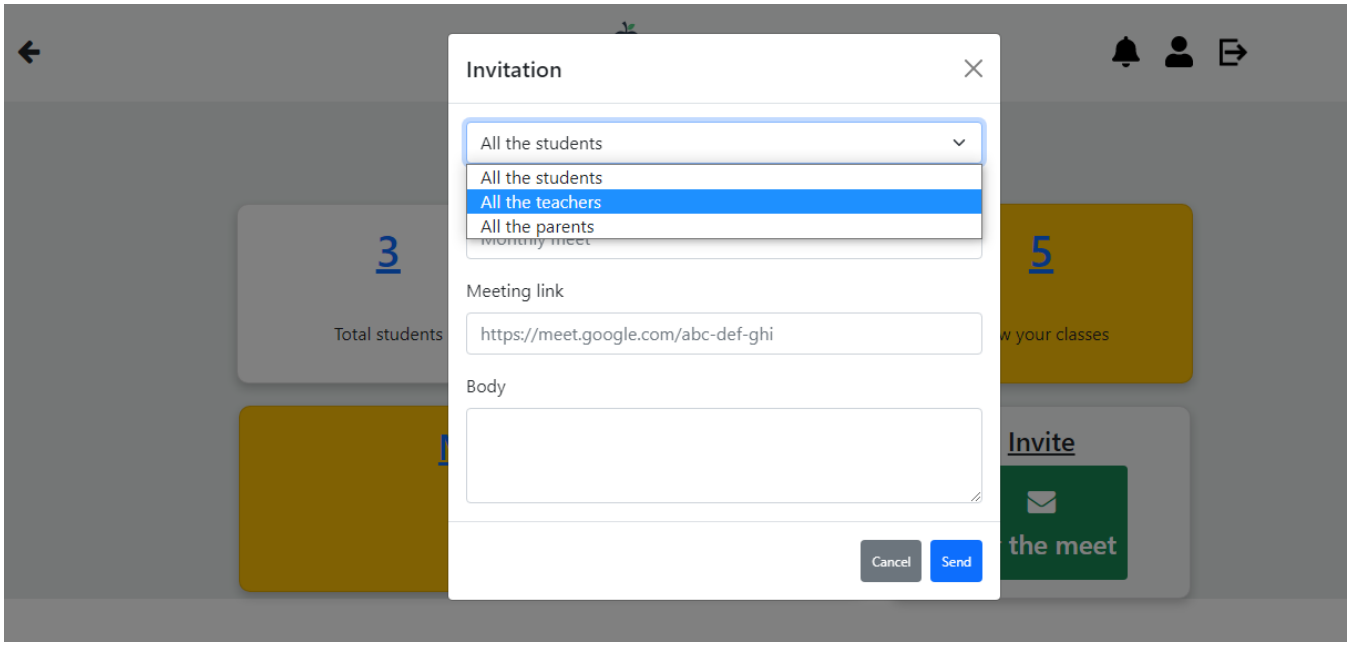

Figure 5.25 Invitation view via e-mail

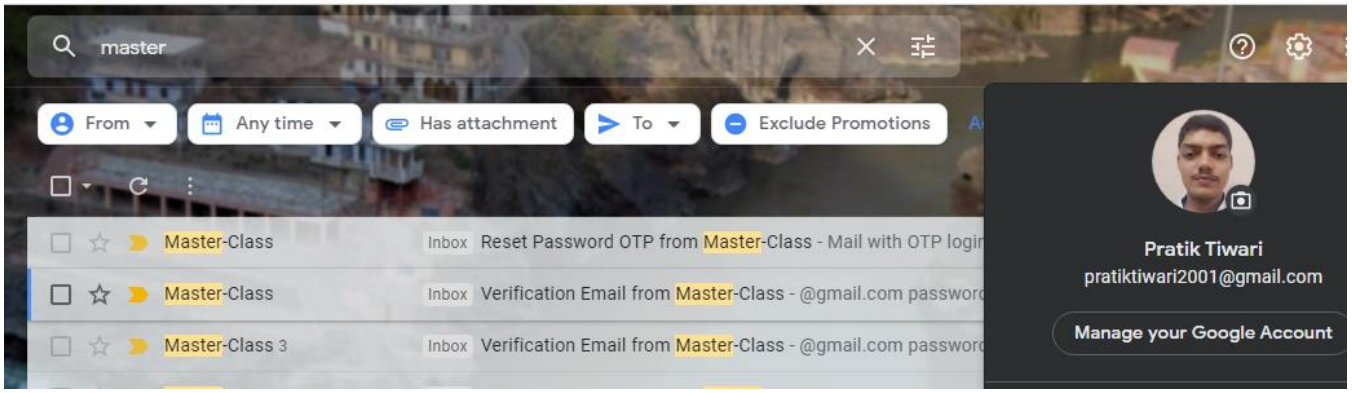

Figure 5.26 Proof of email being received

5.1.2. Discussion of the results

Results:

a. Use of mail jet API for email delivery.

b. Use of git technology

   a. Creation, merger, closing of pull requests

   b. Resolving of merge conflicts

   c. Creation of releases and tags

c. Use of Canva online tool for graphics creation

5.2. Future Scope

As we all know sky is the limit and here we have MIS which can include anything you may name as more features are added it will become a platform for coaching institute's to run virtual classrooms.

a. Integration of google classroom API's for structured organization who use google workspace for their business.

b. Attendance feature for faculties to mark the attendance with interesting graphics and easy interface which listens to student's name in a particular format and marks the attendance.

5.3. Testing

Mocha, which is a JavaScript test framework for Node.js programs which is used to test backend API's.

Test Designed by: Ayush Tiwari

Test Executed by: Ayush Tiwari

Pre-conditions: Mocha, chai, chai-http installed

Dependencies:

a. "mocha": "^9.2.2"

b. "chai": "^4.3.6"

c. "chai-http": "^4.3.0",

5.3.1. Unit Testing

Table 2 Testing connection to the port 8080

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Enter url: localhost:8080 or Enter command: npm test	N.A.	Website should be connected	Connected to website successfully	Pass

Table 3 Testing connection to the registration page

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Enter url: localhost:8080/users/register	N.A.	Signup page should be displayed	Connected to signup page successfully	Pass

Table 4 Testing connection to the login page

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Enter url: localhost:8080/users/log in	N.A.	Sign in page should be displayed	Connected to sign in page successfully	Pass

Table 5 Testing logout functionality

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to dashboard and click on Logout button	N.A.	Session removed and navigation to the login page	Successfully navigated to the login page	Pass

Table 6 Testing connection to change password page

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to login page and click on forgot password button	N.A.	Change password page should be displayed	Change password page is displayed	Pass

Table 7 Testing connection to the student id creation page

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/ F)
1	Navigate to dashboard	N.A.	Student ID creation page should be displayed	Student ID creation page is displayed	Pass
2	Click on Id creation tab				
3	Select Student				

Table 8 Testing connection to the teacher id creation page

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/ F)
1	Navigate to dashboard	N.A.	Teacher ID creation page should be displayed	Teacher ID creation page is displayed	Pass
2	Click on Id creation tab				
3	Select Teacher				

Table 9 Testing connection to the add class page

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to dashboard	N.A.	Add Class page should be displayed	Add Class page is displayed	Pass
2	Click on Classes tab				
3	Select Add Class				

Table 10 Testing Dashboard: Total students

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to dashboard and click on Total students	N.A.	Student list should be fetched From the db.	Successfully fetched student list	Pass

Table 11 Testing Dashboard: Teacher strength

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to dashboard and click on Teacher strength	N.A.	Teacher list should be fetched From the db.	Successfully fetched teacher list	Fail (Timeout error)

Table 12 Testing Dashboard: View your classes

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to dashboard and click on View your classes	N.A.	Classes list should be fetched From the db.	Successfully fetched classes list	Fail (Timeout error)

Table 13 Testing Dashboard: Create topper

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to dashboard and click on Create topper	N.A.	Create topper page should be displayed	Successfully displayed create topper page	Pass

Table 14 Testing Dashboard: View topper

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to dashboard and click on View topper	N.A.	View topper page should be displayed	Successfully displayed View topper page	Pass

Table 15 Testing Dashboard: Teacher attendance

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to dashboard and click on Teacher attendance	N.A.	Teacher attendance page should be displayed	Successfully displayed Teacher attendance page	Pass

5.3.2. Integration Testing

Table 16 Testing register API

Description: Test whether registration details are stored into the db. whenever a new user registers

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to the signup page		Registration details should be stored in the MySQL database	The registration details of new user are successfully stored in the database	Pass
2	Enter admin's name	Test			
3	Enter institute's mob no.	1000000000			
4	Enter institute's name	Test Institute			
5	Enter institute's email id	Test@email.com			
6	Enter GST/PAN no. (PK)	1000000000			
7	Enter Aadhaar no.	100000000000			
8	Click on Sign up button				

Table 17 Testing login API

Description: Verifying the login data from the db. and test whether user is able to sign in

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to the login page		User should be able to login	User is navigated to dashboard with successful login	Pass
5	Enter institute's email id	Test@email.com			
7	Enter password	XbHwSgC9u9J3TMH			
8	Click on login button				

Table 18 Testing forgot password API

Description: Changing old password to new password

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to the forgot pass page		User should be able to change password	User is navigated to dashboard and password is changed successfully	Pass
2	Enter old password sent on mail	XbHwSgC9u9J 3TMH			
3	Enter new password	Test@123			
4	Re-enter new password	Test@123			
5	Click on change pass button				

Table 19 Testing add class API

Description: Test whether a class is created and its details are stored into the db.

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to the Classes tab		Class details should be stored in the MySQL database	The details of class are successfully stored in the database	Pass
2	Select Add class option				
3	Enter class name	class 10 Maths			
4	Enter fees.	5000			
5	Enter/Select a board	CBSE			
6	Enter/Select a standard	10			
7	Enter/Select a subject	Maths			
8	Create/Assign it to teacher	Nidhi Arora			
9	Click Add Class info				

Table 20 Testing student id creation API

Description: Test whether student's registration details are stored into the db. whenever a new student is created

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Navigate to the Student id creation page		Student's registration details should be stored in the MySQL database	The registration details of a new student are successfully stored in the database	Pass
2	Enter student's name	Pratik Tiwari			
3	Enter email id	s1032180256@tcetmumbai.in			
4	Enter mobile no.	1234567890			
5	Enter gender	Male			
6	Select birth date	21-05-2008			
7	Select classes to admit	class1, class2			
8	Add Parent details	"optional"			
9	Click on Add student info button				

5.3.3. Deployment Testing

Table 21 testing the deployment of the website

Description: Verifying whether the website is functioning at the deployment stage https://master-class-b14.herokuapp.com/

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Enter the hosted website url	Enter the required details	• Website should be loading • All the pages should be opening	• Website is loading • All the pages are accessible by the admin • Website is working as efficient as it was on localhost	Pass
2	Register/Login				
3	Add Class/Student/Teacher				
4	View Dashboard				

Table 22 testing the deployment of the database

Description: Verifying whether the db. is deployed to the Amazon RDS

Step	Test Steps	Test Data	Expected Result	Actual Result	Status(P/F)
1	Register as admin	Enter the required details	• The registration details should be stored in the db. provided by Amazon RDS • The user should be able to login	• The registration details are stored successfully • The user is able to login and navigate to the dashboard • Hence, database is deployed successfully	Pass
2	Login as admin				

5.4. Deployment

We have used heroku which is platform as a service and provides 550 dyno hours per month. It provides https protocol support for deployment of hobby projects.

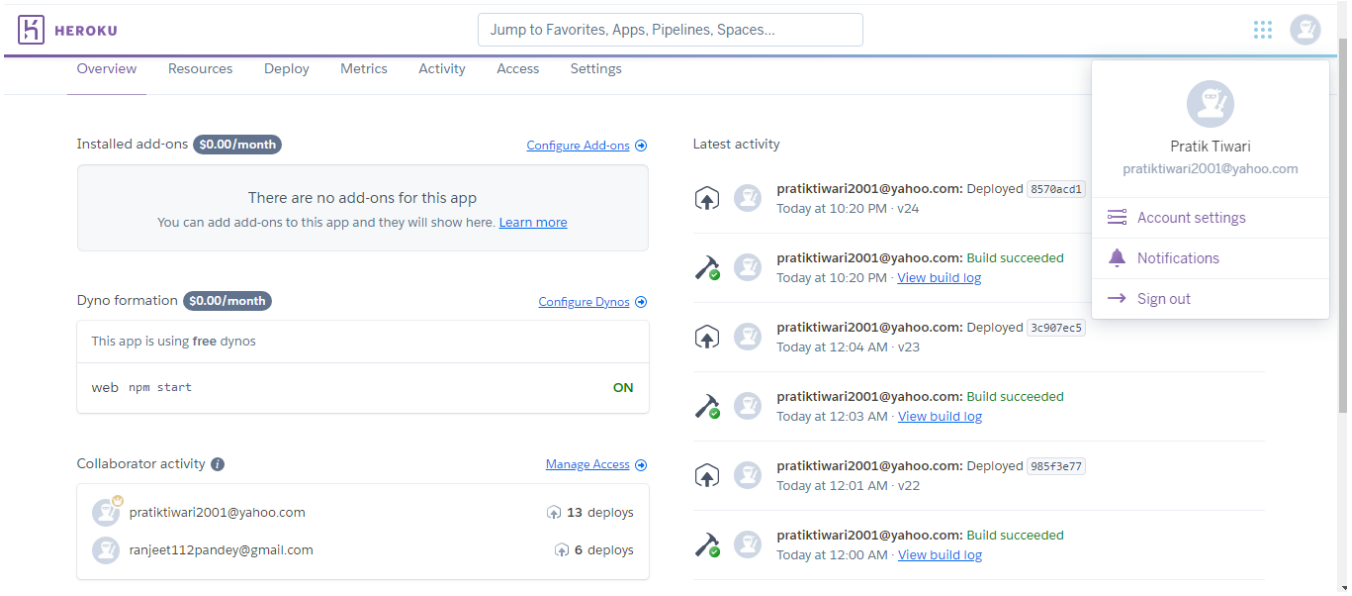

Figure 5.27 Heroku PAAS

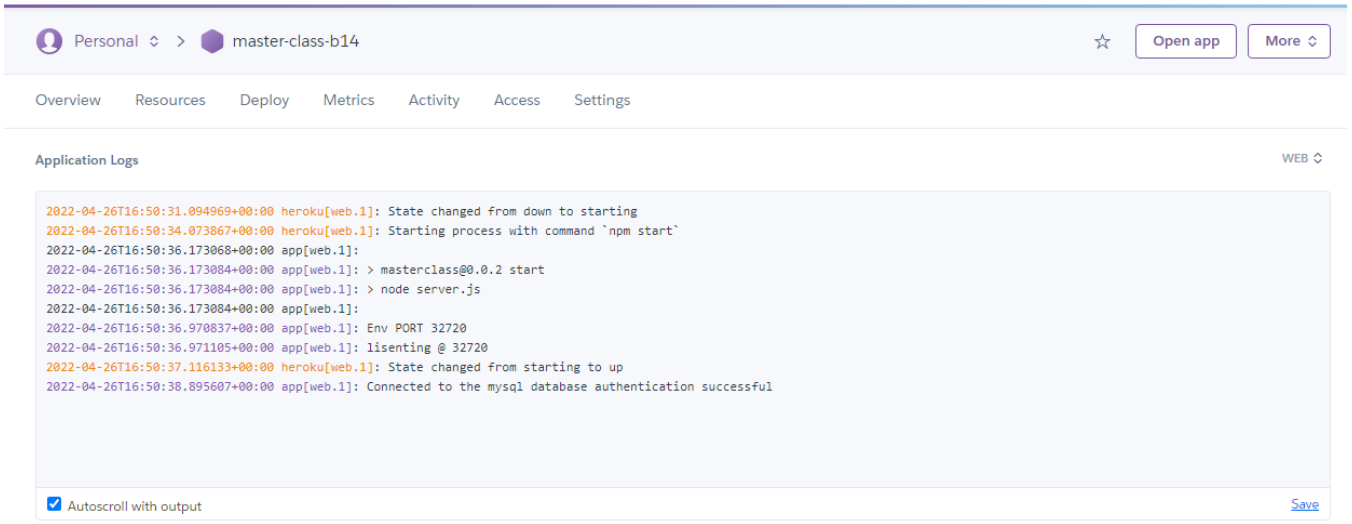

Figure 5.28 Deployment logs

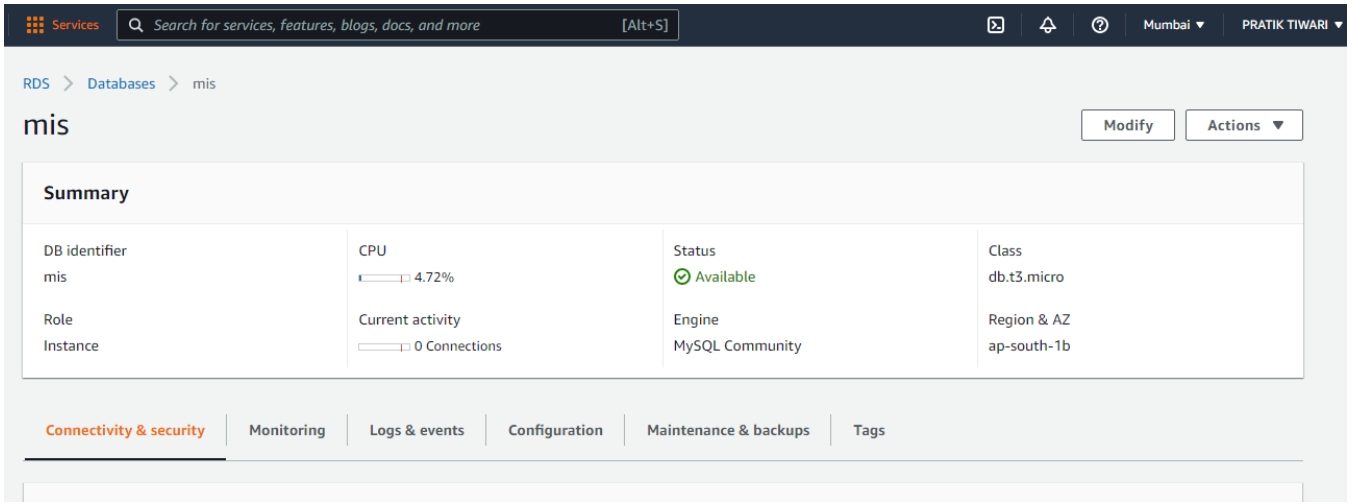

Figure 5.29 Amazon RDS service

Amazon RDS using MySQL community version to run our database.

Chapter 6. Conclusion

6.1. Conclusion

Master-class project is the crux of what we have learned in our engineering education from TCET which makes me feel proud of it. For us the project has opened various dimensions of life which will make our future bright and this project has taught how to plan, how to start early and how to get work done among us by collaborating and how to be serious about it. Deployment over the internet boosted the confidence level and gave us the light to excel and make better products by sincere efforts and team collaboration. This project was the reason we did customer interaction, we changed the tech stack based on feedback from first phase to MySQL as it had the reason why to use MySQL instead of MongoDB. Overall this project had made us a better individual.

References:

Table 23 references

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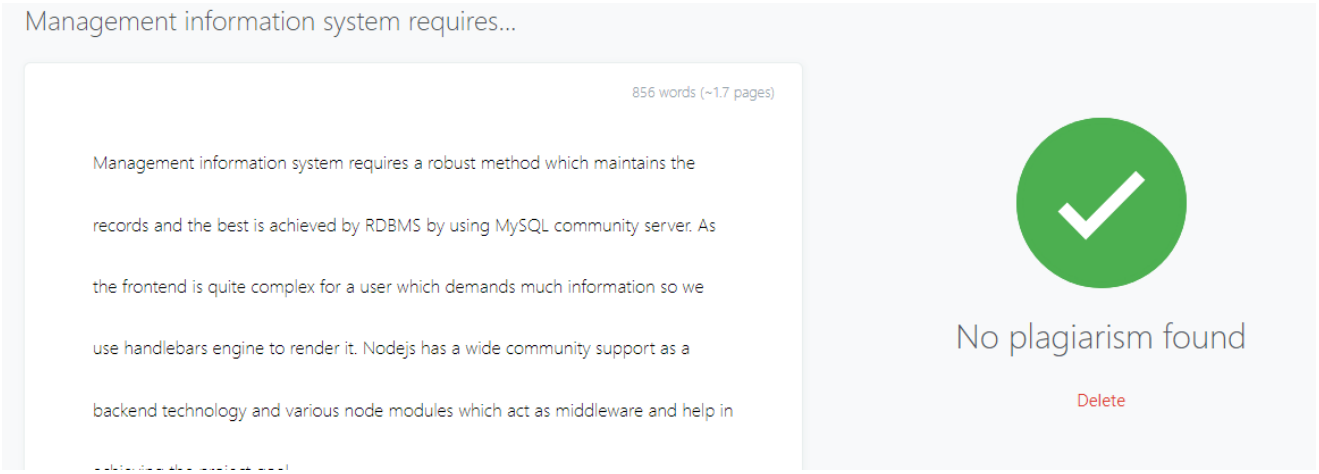
Appendix:

[A] Plagiarism check report



[B] Graduate Attributes and its mapping with the project

PO 5:	Modern Tool Usage (Git, Canva)
Po 8:	Ethics (Coding standards)
Po 10:	Communication (Customer interaction)
Po 11:	Life-Long Learning (Deployment)
Po 12:	Project Management & Finance (Amazon RDS)

Publication

Table 24 Journal papers

Sr. No.	Paper Title	Publication details	Phase of project
1	Development of MIS for Training Institute using MySQL, NodeJs, ExpressJs and Handlebars	ICICN 2022 SUBMISSION ID: 8	Web application

TCET
Celebrating 20 years of Imparting Quality Education

आज़ादी का अमृत महोत्सव

Estd. 2001

NASI Mumbai Chapter

13th

MEW 2022 Invention & Innovation

MULTICON-W 2022

- A platform for Multiple Conferences and Workshops Since 2010

February 25th & 26th 2022, Friday & Saturday

IC-ICN 2022

Certificate

APPRECIATION

This is to certify that Dr./Mr./Ms. **Pratik Tiwari** has presented/published a **FLP** length paper with the title **Development of MIS for Training Institute using MySQL, NodeJs, ExpressJs and Handlebars** in the **International Conference on Intelligent Computing & Networking (IC-ICN-2022)** organized during February, 25th & 26th, 2022 at Thakur College of Engineering and Technology, Kandivali (E), Mumbai.

(Dr. B. K. Mishra)
Principal & Programme Chair

Institute Partners	Other Partner	Collaborators

Lagdu Singh Charitable Trust's (Regd.)

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