College Automation System

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Work Proof:

You can check live website here

You can check github repo here

Problem Statement

- In today’s world, in fact, Automation systems are used in almost any type of organization - large or small.
- The latest Automation tools available in the market today can cover a wide range of functions and integrate them into one unified database.
- In today’s competitive business world usage of Automation system is becoming a must for any educational organization to meet the challenges faced.
- So in order to be different and ready for action the institutes need a central resource planning that can manage the entire information and operations of the institutions.
- As we know that, a college consists of different departments, such as course departments, fees management, library, event management etc.
- By having one main system they can interact with each other from their respected system by having valid user id and password.

Scope

- The project is designed to help the teachers and students manage their daily basis college activities.
- It consists of relational databases of students, departments, faculty, courses of the entire university.
- Using these databases, various functions are included like Attendance management, Marks management and Timetable management are provided.
- Within attendance management, a teacher can enter the attendance status of each student for each course with their respective departments.
- Similar to attendance, Internal and Semester end marks can also be entered for each student.
- This is a complete full stack application.

Introduction

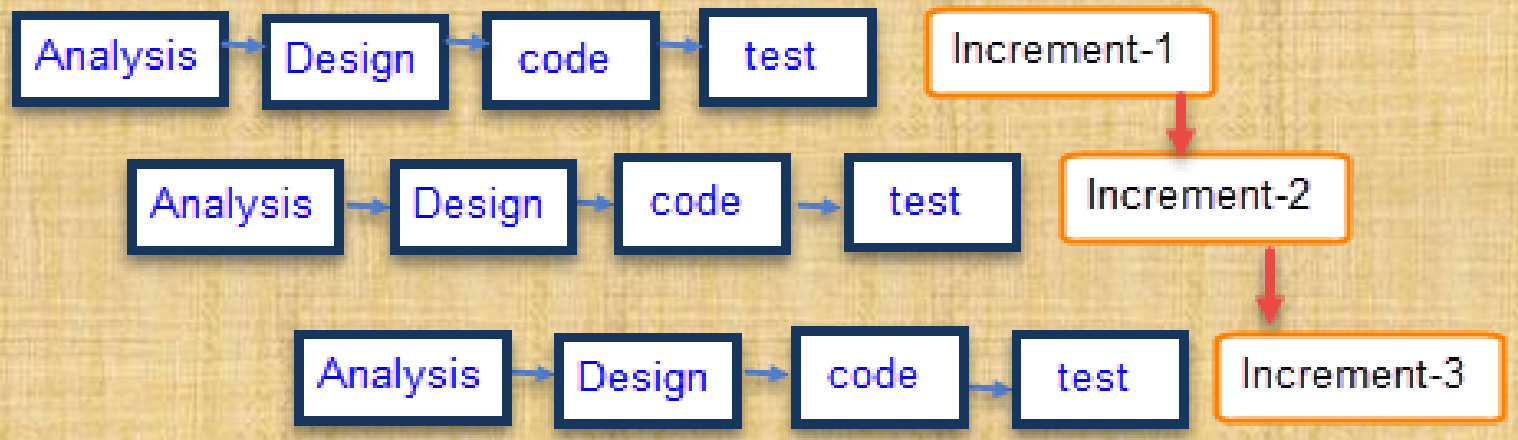
- The objective of College Automation System is to allow the administrator of any organization the ability to edit and find out the personal details of a students and teachers and allows to keep their profile up to date.
- Overall, it'll make Student Information an easier job for the administrator and the student of any organization.
- The main purpose of this project is intended to help any organization to maintain and manage personal data of their respective stakeholders which are most commonly like students and teachers.
- This integrated system connects daily operations in the college environment ranging from Attendance management, Records of marks.
- Efficient security features provide data privacy and hence, increase their productivity.

Requirements

- Information regarding **students**, **teachers** and **courses** are stored in the database. Every user can view only certain information based on their user class.
- The **administrator** shall be able to view all the information in the database.
- Attendance and marks entry is the main feature of the College Automation system.
- Teachers update the attendance and marks of the students who are part of his/her class.
- Students can view their respective Attendance and marks of the courses they have taken.
- Teachers shall be able to view, update and edit the attendance and marks of the students, part of their class of their departments.
- Students may give their queries and feedback to a teacher and they may respond accordingly.

Design

- While designing, we have used Incremental Process model.
- We tried to keep this system less complicated as much as possible.
- Incremental model will be suitable for this system for its flexibility and ease to modify the system later.



Incremental Model

- Now, the main question is **Why we have used Incremental Model?**

  - A) We intend to develop our Web App in small stages. Each stage will be developed according to the priority.
  - B) We have an idea that initially the basic functionality of this app should be implemented.
  - C) And then to develop further we add more functionalities after proper analysis and discussion.

System Design

- The software is divided into **3 modules** which are **students**, **teachers** and **administrators**. We shall look at each module in detail.

Student

- Each student belongs to a class identified by semester and section. Each class belongs to a department and are assigned a set of courses. Therefore, these courses are common to all students of that class. The students are given a unique username and password to login. Each of them will have a different view. These **views** are described below.

- **Student information :**
  - Each student can view only their own personal information. This includes their personal details like name, phone no, address etc. Also, they can view the courses they are enrolled in and the attendance, marks of each of those.
- **Attendance information :**
  - Attendance for each course will be displayed. This includes the number of attended classes and the attendance percentage. If the attendance percentage if below a specified threshold, say 75%, It will be marked in red otherwise it be in green. There will also be a day wise attendance view for each course which shows the date and status. This will be presented in a calendar format.

System Design

Marks information :

There will be 2 internal exams named as (Test 1 and Test 2) and 1 end semester examination for each course. The marks for each of these will be provided in the system.

Timetable information :

Students can view timetable in a tabular form. The timetable displays all the courses of the respective student that he has registered for corresponding department and the time and day at which they are conducted.

Students Feedback :

Here students can give the feedback with open minded and identity of each student is kept private. They can give feedback for their respective courses and faculties .

Clubs and Events :

Here students can view all the club events and their details which are conducted by the institution.

Clubs Registration :

Here students can view all the club events and their details and can register to participate in different clubs.

System Design

Teacher

Each teacher belongs to a department and are assigned to classes with a course. Teachers will also have a username and password to login. The different views for teachers are described below.

Information :

The teachers will have access to information regarding the courses and classes they are assigned to. Details of the class include the department, semester, section and the list of students in each class. The teacher will also have access to information of students who belong to the same class as the teacher.

Attendance :

The teacher has the ability to add and also edit the attendance of each student. For entering the attendance, they will be given the list of students in each class and they can enter the attendance of the whole class on a day to day basis. There will be two radio buttons next to each student name, one for present and the other for absent. There will also be an option for extra classes.

System Design:

Marks :

The teacher can enter the marks for the 2 Internal exams named as Test 1 and Test 2 and 1 End Semester Exam for each course they are assigned. They also have the ability to edit the marks in case of any changes. Reports such as the report card including all the marks and CGPA of a student is generated with the help of these reports.

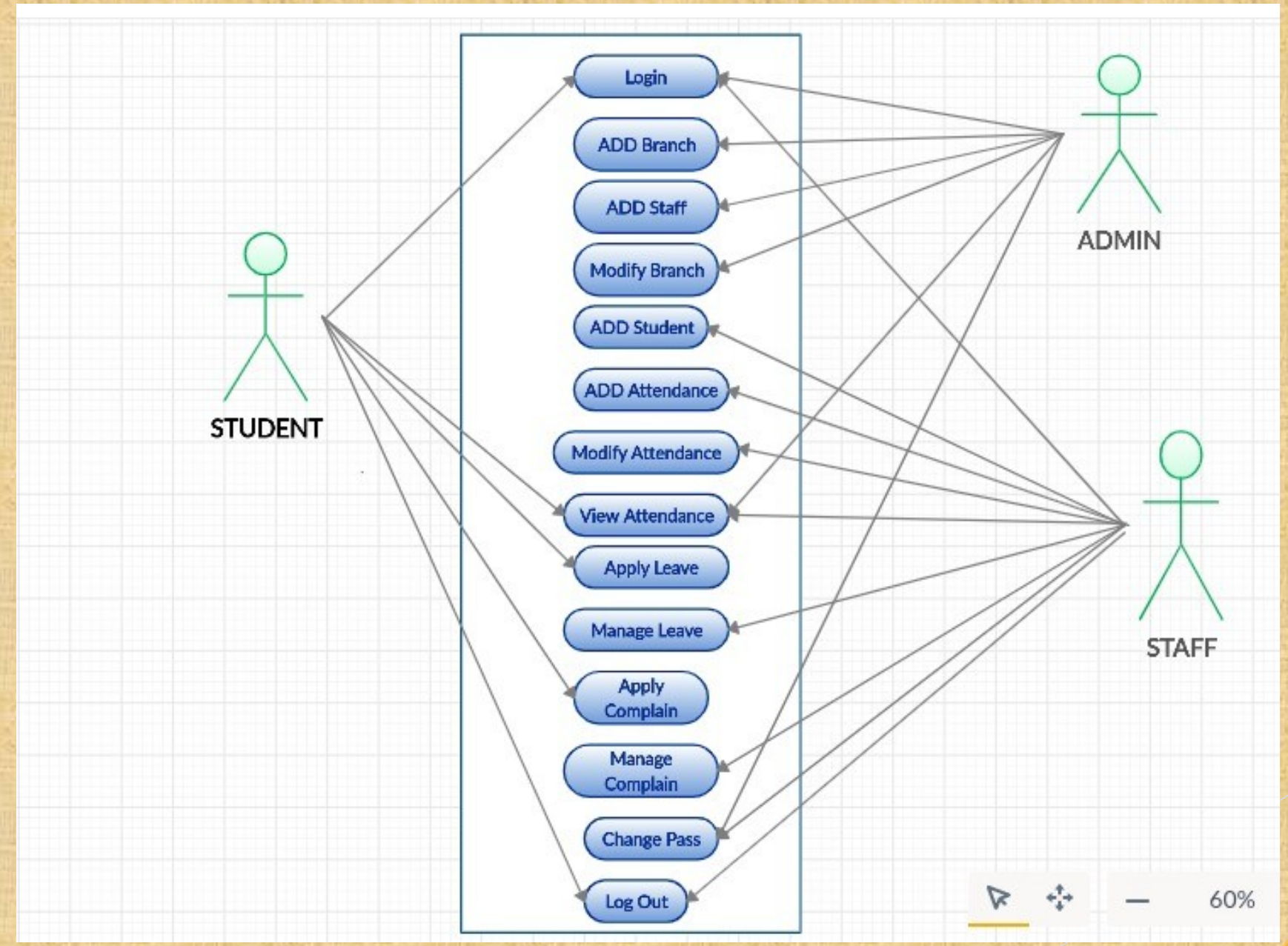
Administrator

The administrator will have access to all the information in the different tables in the database. They will access to all the tables in a list form. They will be able to add a entry in any table and also edit them. They will be provided with search and filter features so that they can access data efficiently. So here we can have more than one administrators also.

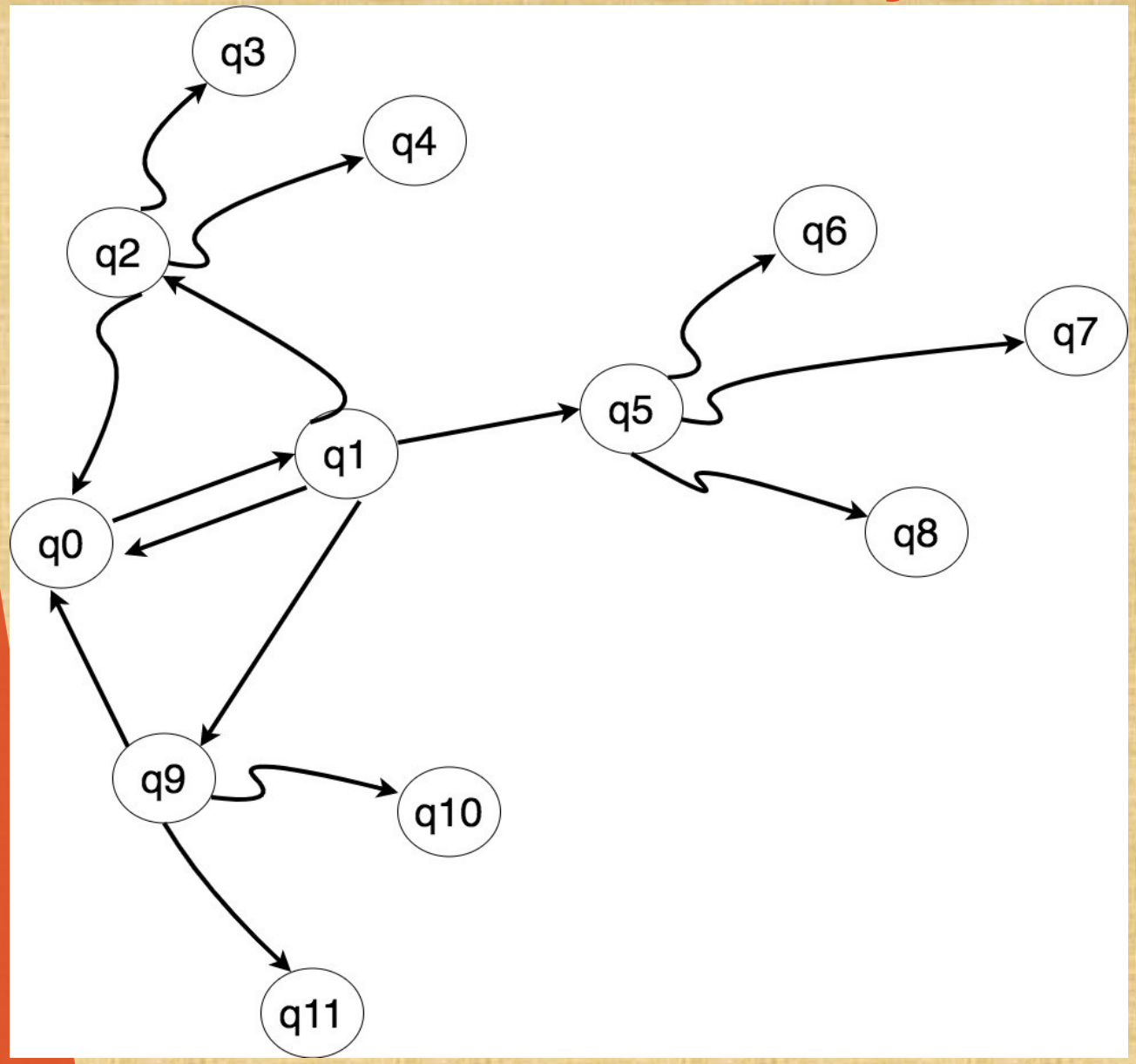
Following slides contain use case diagram and state diagram which will help to understand complete design of **College Automation System** .

- Software used for all project diagrams is – 1. **creately.com** 2. **draw.io**

Design Schema 1 : Use Case Diagram

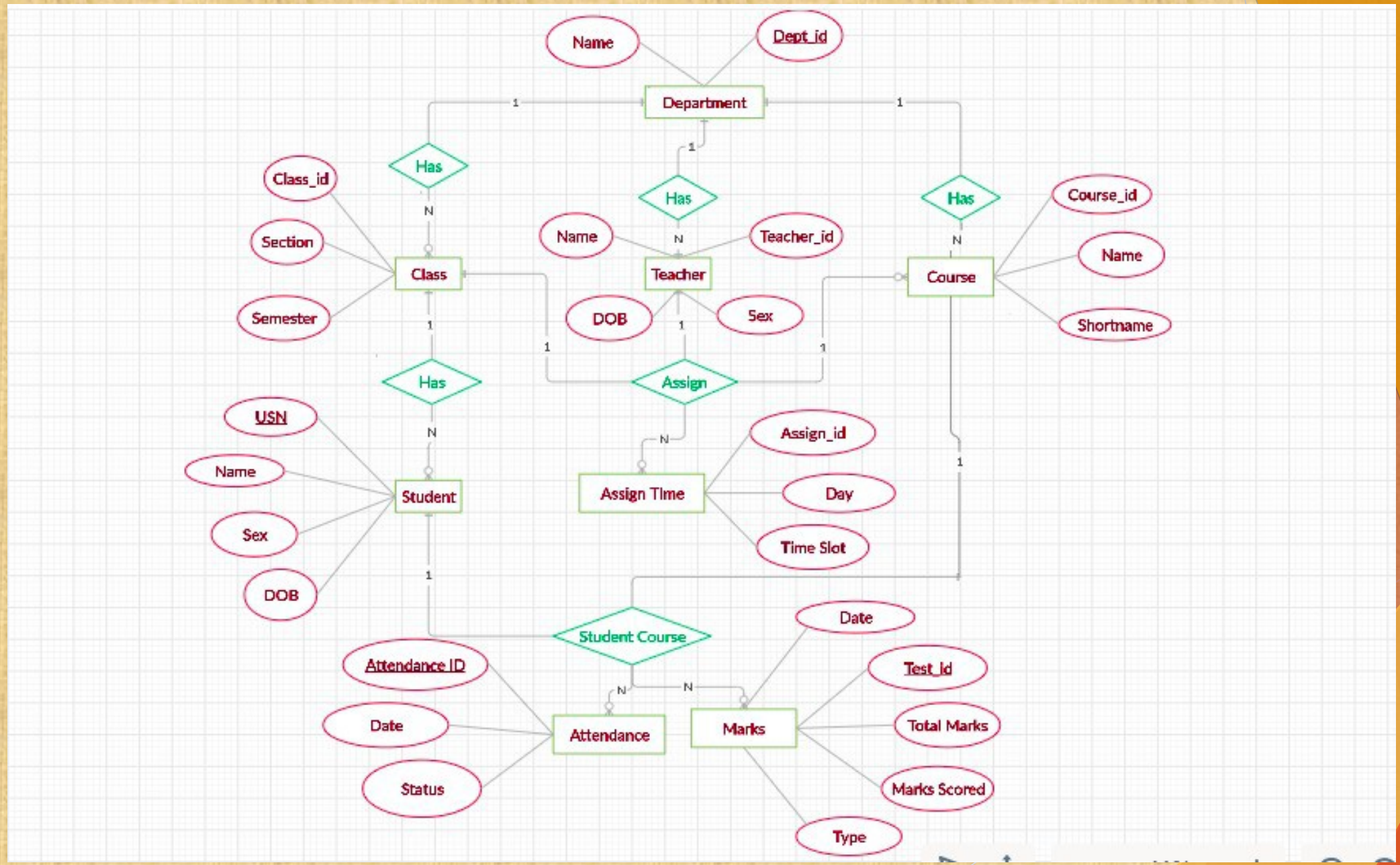


Design Schema 2: Finite state machine for system

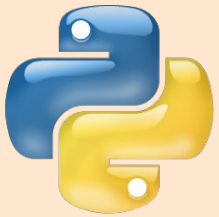


State	Description
q0	Homepage
q1	Login
q2	Admin Dashboard
q3	Managing Users
q4	Managing Timetable
q5	Employee Dashboard
q6	Student Attendance
q7	Leave Management
q8	Student Results
q9	Student Dashboard
q10	View Attendance
q11	View Result

Design Schema 3 : Entity Relationship Diagram



Implementation

Front End	Back End	Database	API
			
			
			

System Testing: White Box Testing

- This allows the software team to examine parts of a system that are rarely tested and ensures that the most important function points have been tested.
- This project is implemented using python with the Django framework. The code consists of models and views which can be tested.
- Models define the tables stored in SQL(Sqlite) and the relationship between the different tables using foreign keys.
- Python also provides file called **test.py** where we can write unit tests for the models and views.

Unit Testing :

```
(newenv) Adityas-MacBook-Air:CollegeAS adityagarde$ ls
CollegeAS       db.sqlite3      info            manage.py       newenv          test.py
(newenv) Adityas-MacBook-Air:CollegeAS adityagarde$ python manage.py test -v2
Creating test database for alias 'default' ('file:memorydb_default?mode=memory&cache=shared')...
Operations to perform:
  Synchronize unmigrated apps: info, messages, staticfiles
  Apply all migrations: admin, auth, contenttypes, sessions
Synchronizing apps without migrations:
  Creating tables...
    Creating table info_user
    Creating table info_dept
    Creating table info_course
    Creating table info_class
    Creating table info_student
    Creating table info_teacher
    Creating table info_assign
    Creating table info_assigntime
    Creating table info_attendanceclass
    Creating table info_attendance
    Creating table info_attendancetotal
    Creating table info_studentcourse
    Creating table info_marks
    Creating table info_marksclass
    Creating table info_registrationdata
    Creating table info_eventregistration
    Creating table info_clubs
    Running deferred SQL...
```

```
Running migrations:
  Applying contenttypes.0001_initial... OK
  Applying admin.0001_initial... OK
  Applying admin.0002_logentry_remove_auto_add... OK
  Applying admin.0003_logentry_add_action_flag_choices... OK
  Applying contenttypes.0002_remove_content_type_name... OK
  Applying auth.0001_initial... OK
  Applying auth.0002_alter_permission_name_max_length... OK
  Applying auth.0003_alter_user_email_max_length... OK
  Applying auth.0004_alter_user_username_opts... OK
  Applying auth.0005_alter_user_last_login_null... OK
  Applying auth.0006_require_contenttypes_0002... OK
  Applying auth.0007_alter_validators_add_error_messages... OK
  Applying auth.0008_alter_user_username_max_length... OK
  Applying auth.0009_alter_user_last_name_max_length... OK
  Applying auth.0010_alter_group_name_max_length... OK
  Applying auth.0011_update_proxy_permissions... OK
  Applying sessions.0001_initial... OK
System check identified some issues:
```

System Testing : User Acceptance Testing

- Acceptance testing performed by the customer is known as user acceptance testing (UAT).
- Since our project is on College Automation System, the teachers and students are key stakeholder.
- Hence, it was important to allow the students and teachers to test the software and get their approval as they intend to use the software the most. Therefore, to my best I discussed with my project partner and other colleagues and gave the demonstration of the project
- We discussed all the features and functionality of the website.
- And overall, with the help of their feedbacks we tried to meet the needs of this automation system.

Conclusion

- By using Existing System accessing information from files is a difficult task and there is no quick and easy way to keep the records of students and staff members .
- As the name suggests it is the system that deals with the issues related to a particular institution.
- With the help of this project, fundamental problem in maintaining and managing the work by the administrator is hence overcome.
- By developing this web-based application the administrator can enjoy the task, doing it ease and also by saving the valuable time.
- The amount of time consumption is reduced and also the manual calculations are omitted, the reports can be obtained regularly and also whenever on demand by the user.
- Thus the system developed will be helpful to the administrator by easing his/her task.

Future Scope

- This System provide the automate admissions ,no manual processing is required. Hence in future most of the manpower will be saved due to paperless work.
- As all years of information need to be stored , hence Blockchain technology will help to make database more secure and reliable.
- With the help of this , the data which is stored in the repository helps in taking intelligent decisions by the management providing the accurate results.
- In future, the storage facility will ease the job of the operator.

Thank You !