Dharmsinh Desai University, Nadiad

Faculty of Technology, Department of Computer Engineering

B.Tech. CE Semester – VI

Subject: System Design Practice

Project Title:

Online Learning Platform

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<u>CERTIFICATE</u>

This is to certify that System Design Practice project entitled "Online Learning Platform" is the bonafied report of work carried out by

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Content

1. Abstract

Online Learning Platform provides basic education functionality. It provides the platform to student. We basically provide subjects of Computer Engineering. Students have different functionality. Teachers are the mentor for the students. Teachers provide content for student. We try to provide medium with some graphical and video content so students can gain better knowledge of fundamentals.

2. Introduction

Online Learning Platform have different two types of users like students and teachers. Teachers have functionalities like upload content like file and video, upload topics articles, and add test questions for different subjects. Students have functionalities like read the articles, explore video and file content. Student can ask the query of any subject to respective subject teachers. Student can also refer the solutions of the past queries which were asked by another students.

Tools/Technologies

Technologies:

HTML 5

CSS 3

Bootstrap 4

Python

Django

DBSqlLite

Tools:

Atom

Sublime Text

Platforms:

Localhost:8000/ in browser

3. Software Requirement Specifications

3.1 Types of User

1. Student

2. Teacher

3. Admin

3.2 System Functional Requirements

R.1: Student

R.1.1: Login

IP: Provide username & password

OP: Success or invalid message

Process: validation of credentials

R.1.2: Register

IP: Add required information

OP: Successfully registered

R.1.3: Explore subject

Content and Credit of the subject will be provided

IP: Click on any subject

OP: Detailed information of the subject

R.1.4: Refer Articles

System provides different list of articles which is uploaded by teachers

IP: Click on articles

OP: Content will be shown

R.1.5: Explore Videos

IP: Click on the particular subject's video

OP: All video content of the subject

R.1.6: Explore Files

IP: Click on the particular subject content

OP: files of topics will be shown

R.1.7: Attempt Test

Student can attempt mini test of any subject

IP: Answer the Multiple choice question

OP: result of the test

R.1.8: Add Queries

Any doubt can be asked by the student

IP: provide query and subject name

OP: query will be sent to the provided subject's teacher

R.1.9: Explore Feed

Student can also explore solution provided by another queries

IP: just go to feed section

OP: All solution will be provided there

R.1.10: Check profile

IP: Check your profile & may change information

OP: Any changes will be applicable except username

R.1.11: Search topics

IP: enter topic or subject name and serach it

OP: related search output will be displayed

R.1.12: Provide feedback

    IP: Contact on our given phone or mail

    OP: Your suggestion will be considered by us

R.2: Teacher

R.2.1: Login

    IP: Provide username & password

    OP: Success or invalid message

    Process: validation of credentials

R.2.2: Register

    IP: Add required information

    OP: Successfully registered

R.2.3: choice subject

    Teachers can select maximum five subjects of their choice

    IP: Select from dropdown at registration time

    OP: Registered subject with their profile

R.2.4: Add Articles

    Topic and description article can be added by teacher

    IP: Attach article with description

    OP: Added to the list

R.2.5: Add Videos

    IP: Upload video of their own

    OP: Student can explore it

R.2.6: Add files content

    IP: Upload file content

    OP: students can refer it

R.2.7: Add Test

    Teachers have to add the test question for student

    IP: Add question with options and level of hardness

    OP: student can attempt test

R.2.8: Give solution

    Solve the queries raised by the students

    IP: give appropriate answer of query

    OP: all students can refer it

R.2.9: Check profile

    IP: Check your profile & may change information

    OP: Any changes will be applicable except username

R.2.10: Provide feedback

    IP: Contact on our given phone or mail

    OP: Your suggestion will be considered by us

R.3: Admin

R.3.1: Login

    IP: Provide username & password

    OP: Success or invalid message

    Process: validation of credentials

R.3.2: Show users

    IP: show request of users

    OP: List of students and teachers

R.3.3: Add subject

    Subject will be handled by admin

    IP: Added new subject

    OP: Added to the subject list

R.3.4: Remove teacher

    IP: remove inappropriate teacher

    OP: that teacher is no longer part of application

R.3.5: Manage feedback

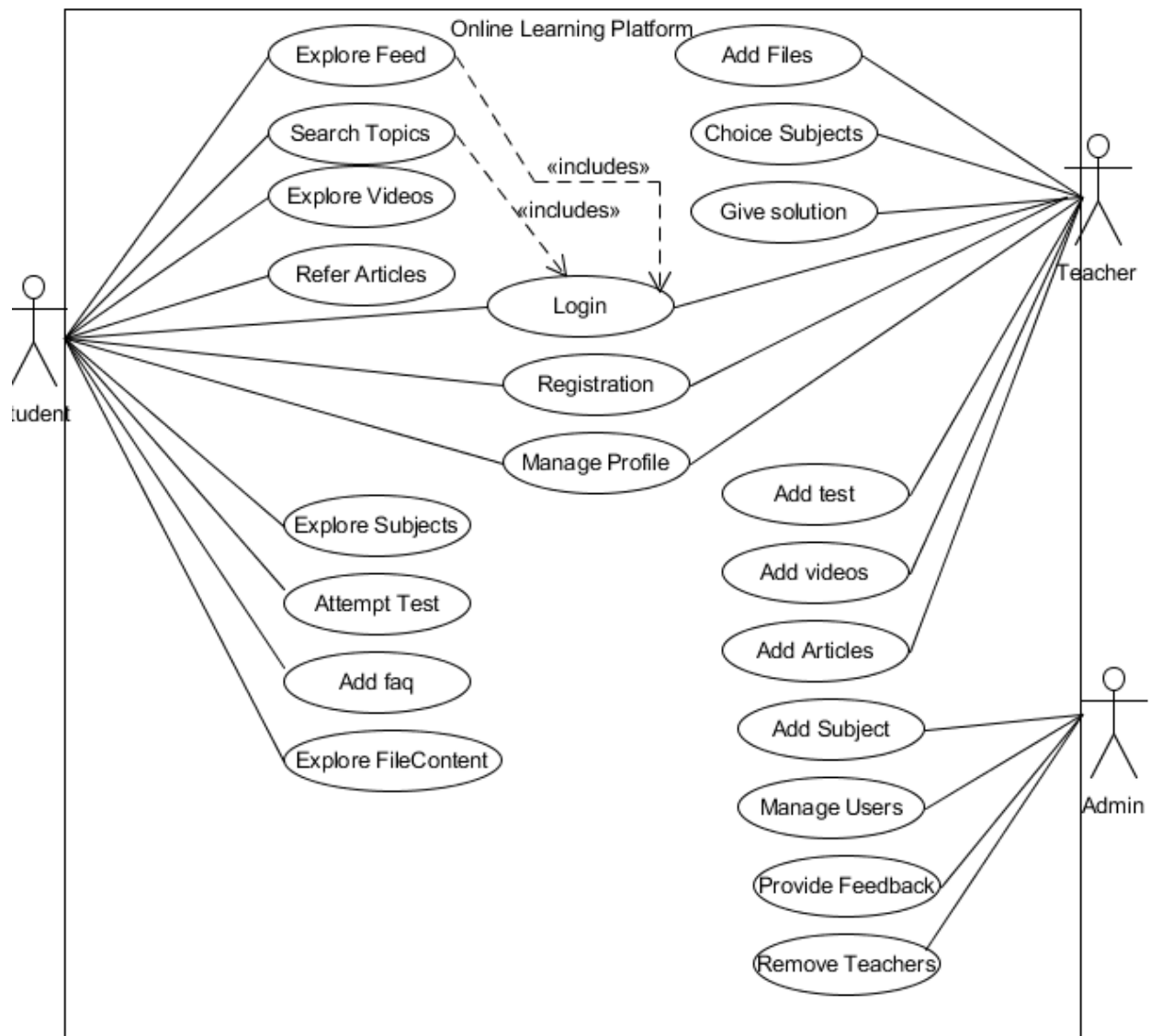   IP: show the list of feedback provided by users

    OP: apply appropriate changes to courses

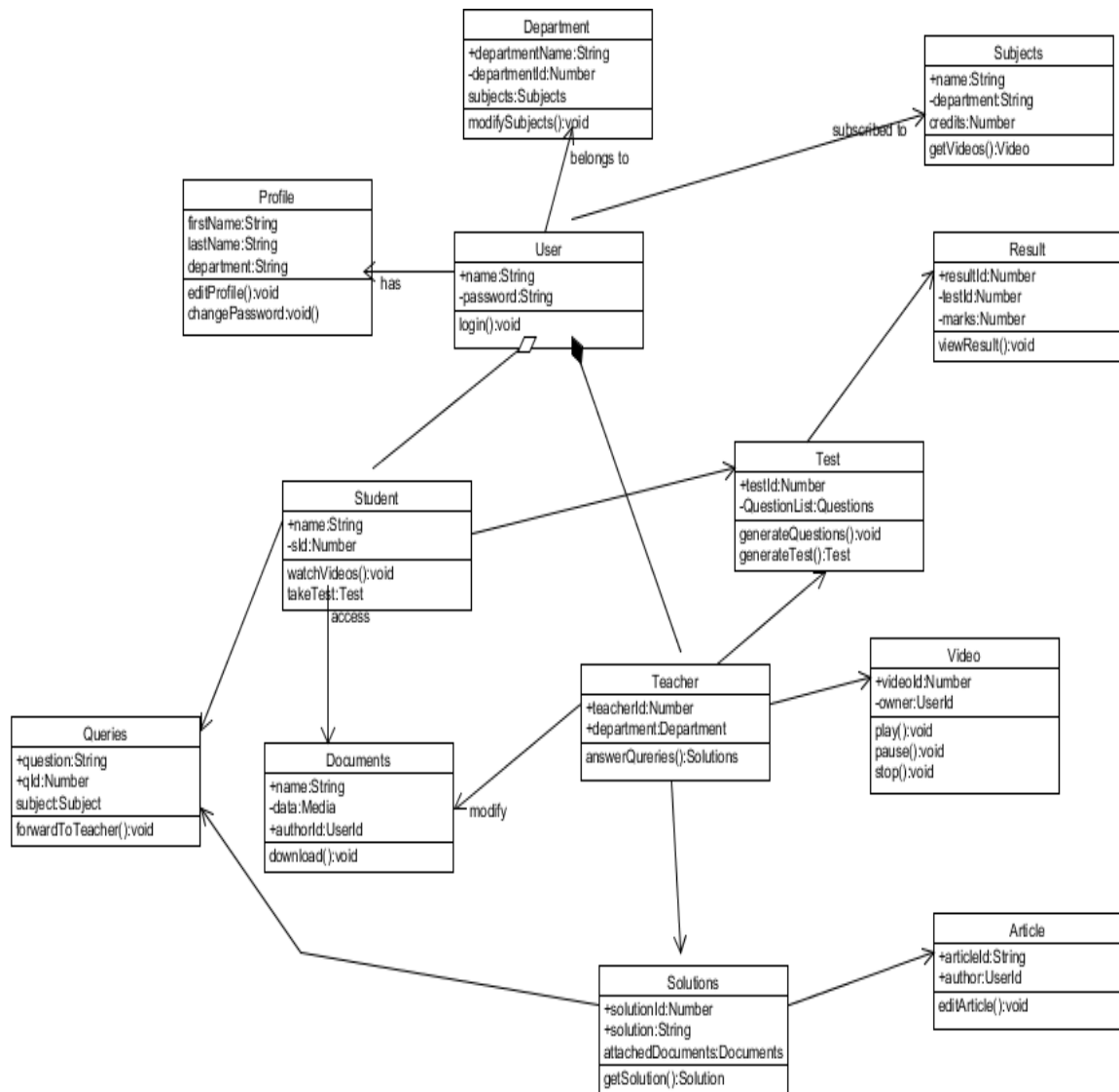## **3.3 System Non Functional Requirements**

- Database
- Editor like Atom
- Django API
- Gmail server
- Smtp server

4.Design

4.1 : Use Case Diagram

4.2: Class Diagram

Department
+departmentName:String
-departmentId:Number
subjects:Subjects
modifySubjects():void

Subjects
+name:String
-department:String
credits:Number
getVideos():Video

subscribed to

belongs to

Profile
firstName:String
lastName:String
department:String
editProfile():void
changePassword:void()

has

User
+name:String
-password:String
login():void

Result
+resultId:Number
-testId:Number
-marks:Number
viewResult():void

Test
+testId:Number
-QuestionList:Questions
generateQuestions():void
generateTest():Test

Student
+name:String
-sId:Number
watchVideos():void
takeTest:Test

access

Teacher
+teacherId:Number
+department:Department
answerQureries():Solutions

Video
+videoId:Number
-owner:UserId
play():void
pause():void
stop():void

Queries
+question:String
+qId:Number
subject:Subject
forwardToTeacher():void

Documents
+name:String
-data:Media
+authorId:UserId
download():void

modify

Article
+articleId:String
+author:UserId
editArticle():void

Solutions
+solutionId:Number
+solution:String
attachedDocuments:Documents
getSolution():Solution

4.3 : Sequnce Diagram

4.3.1: Take the test

_:Student	_:Subject	_:Topic	_:System

select subject → select topic → start test

generate test

answer the question

submit the test

generate solution and result

4.3.2: Upload the content

_:teacher	_:Subject	_:Topic	_:System

select subject → select topic → add content

upload successfully

add questions

upload question

select subject → select topic → read query

upload solution
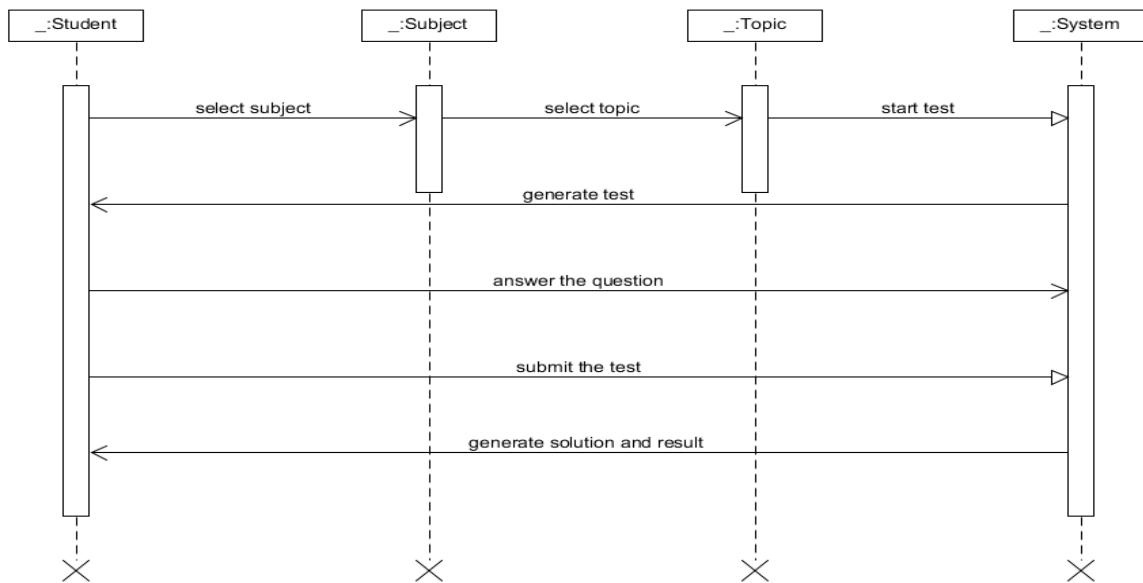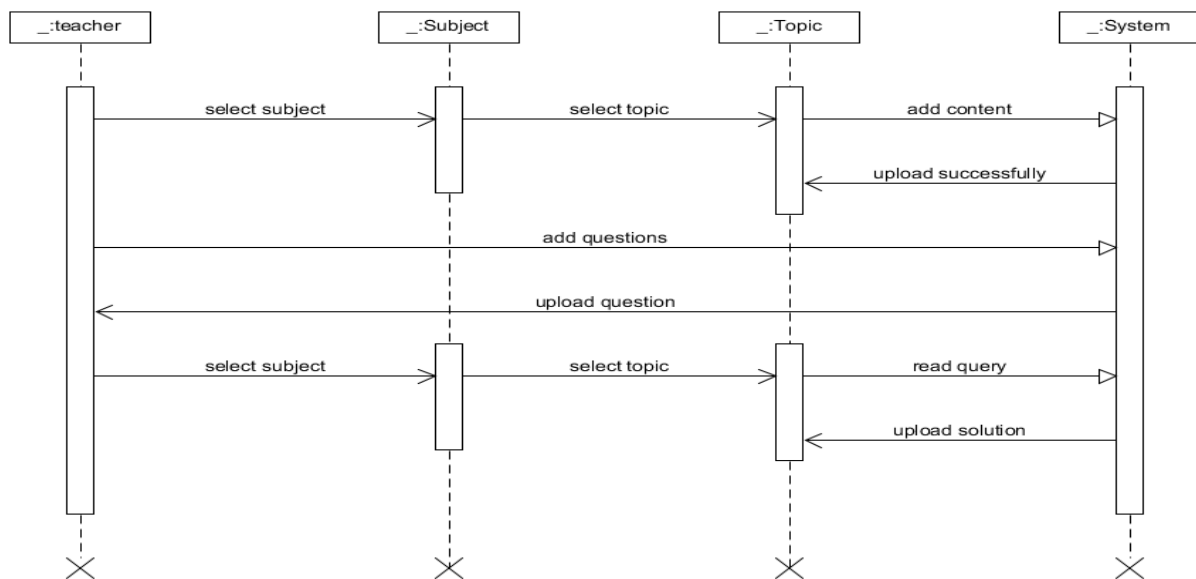
4.4: Activity Diagram

4.4.1: Give the test

```
              ●
              │
              ▼
        ┌──────────────┐
        │ Select subject│
        └──────────────┘
              │
              ▼
        ┌──────────────┐
        │ Select topic │
        └──────────────┘
              │
              ▼
        ┌──────────────┐
        │ Start the test│
        └──────────────┘
              │
              ▼
        ┌──────────────────┐
        │ Answer the Questions│
        └──────────────────┘
              │
              ▼
            ◇
   [Not solve]
        │
        ▼
  ┌──────────────┐
  │ See the hint │          [Solve]
  └──────────────┘
                            │
            ◇
              │
              ▼
        ┌──────────────┐
        │ Submit the test│
        └──────────────┘
              │
              ▼
        ┌──────────────┐
        │ See solution │
        └──────────────┘
              │
              ▼
              ◉
```
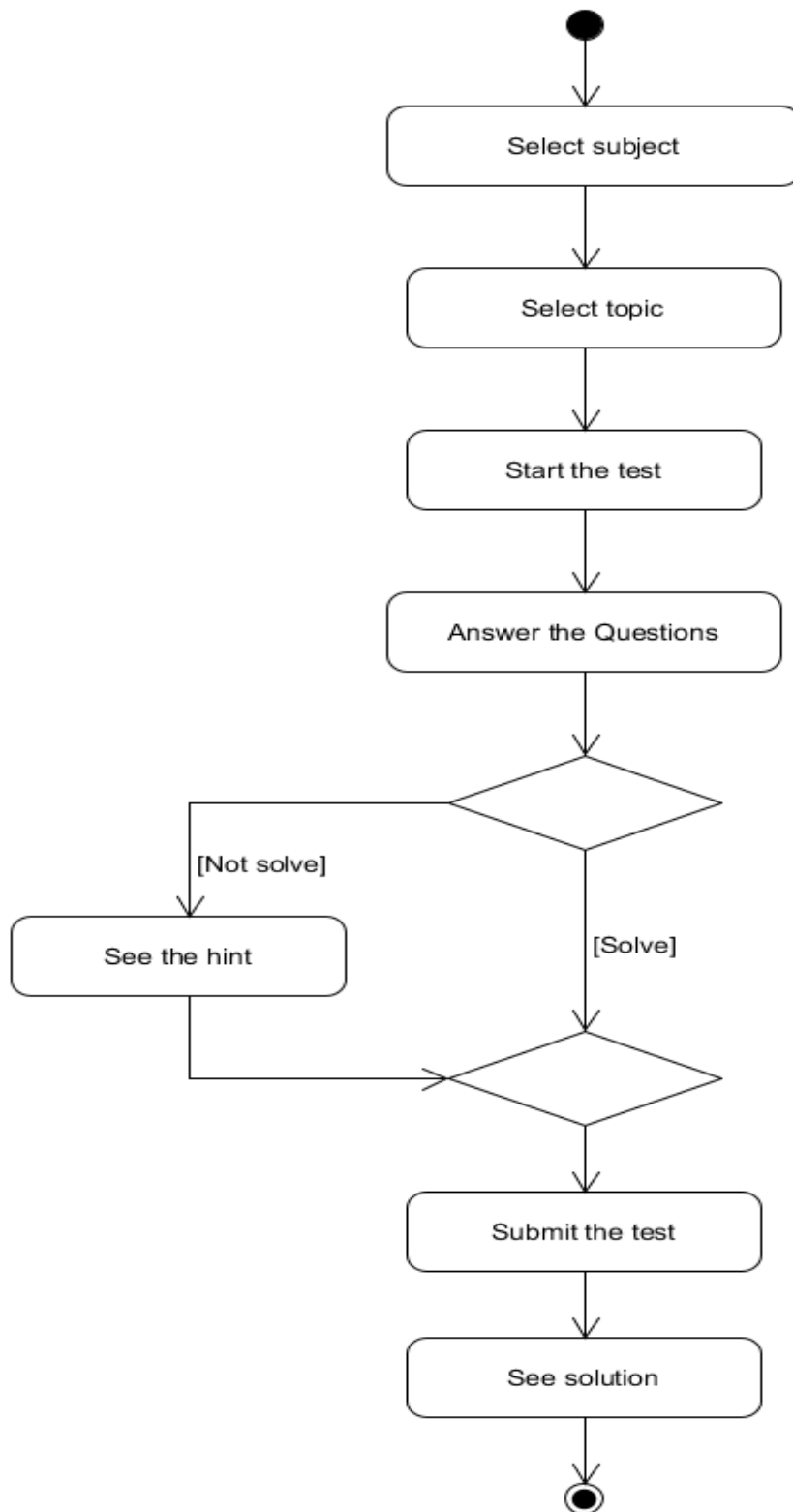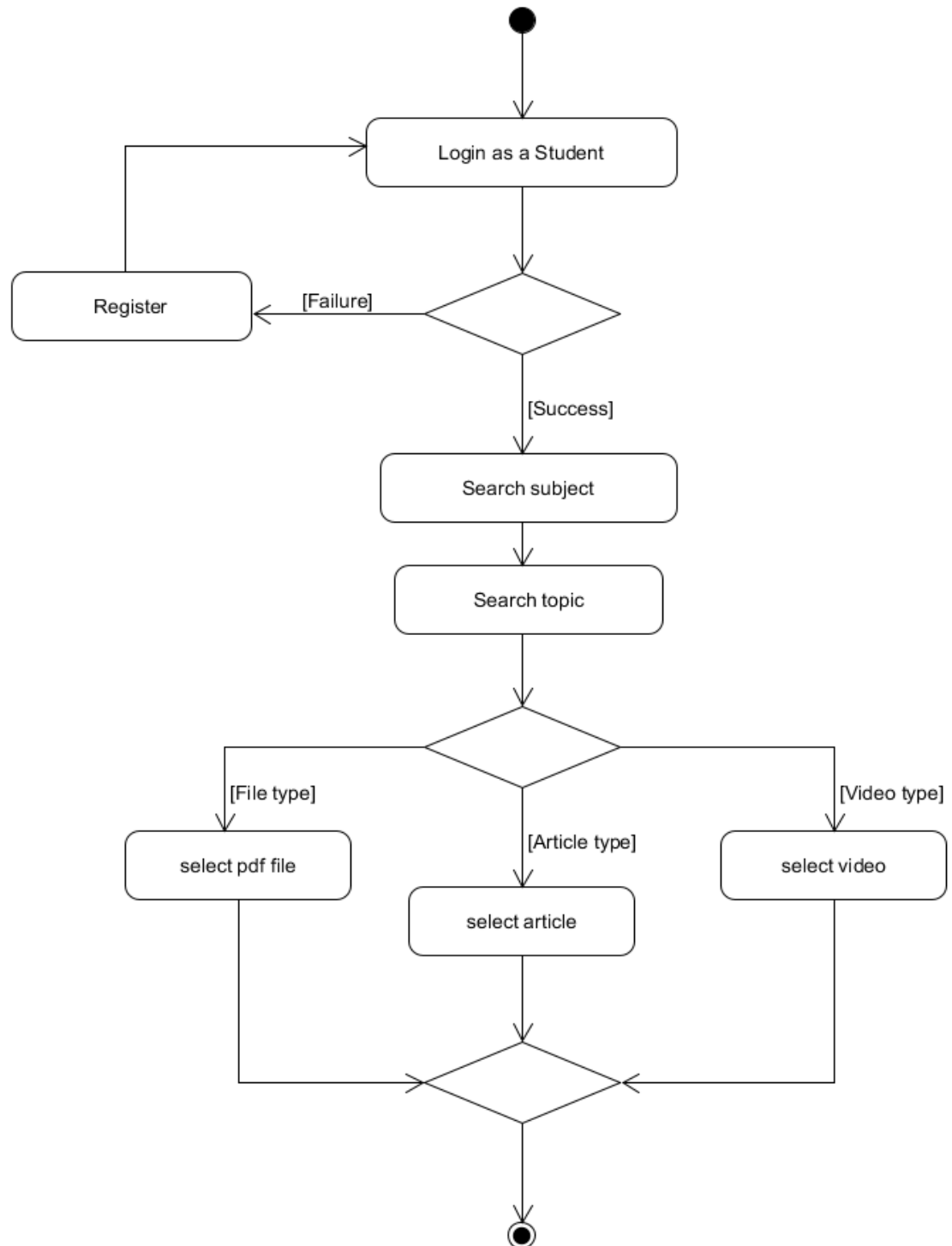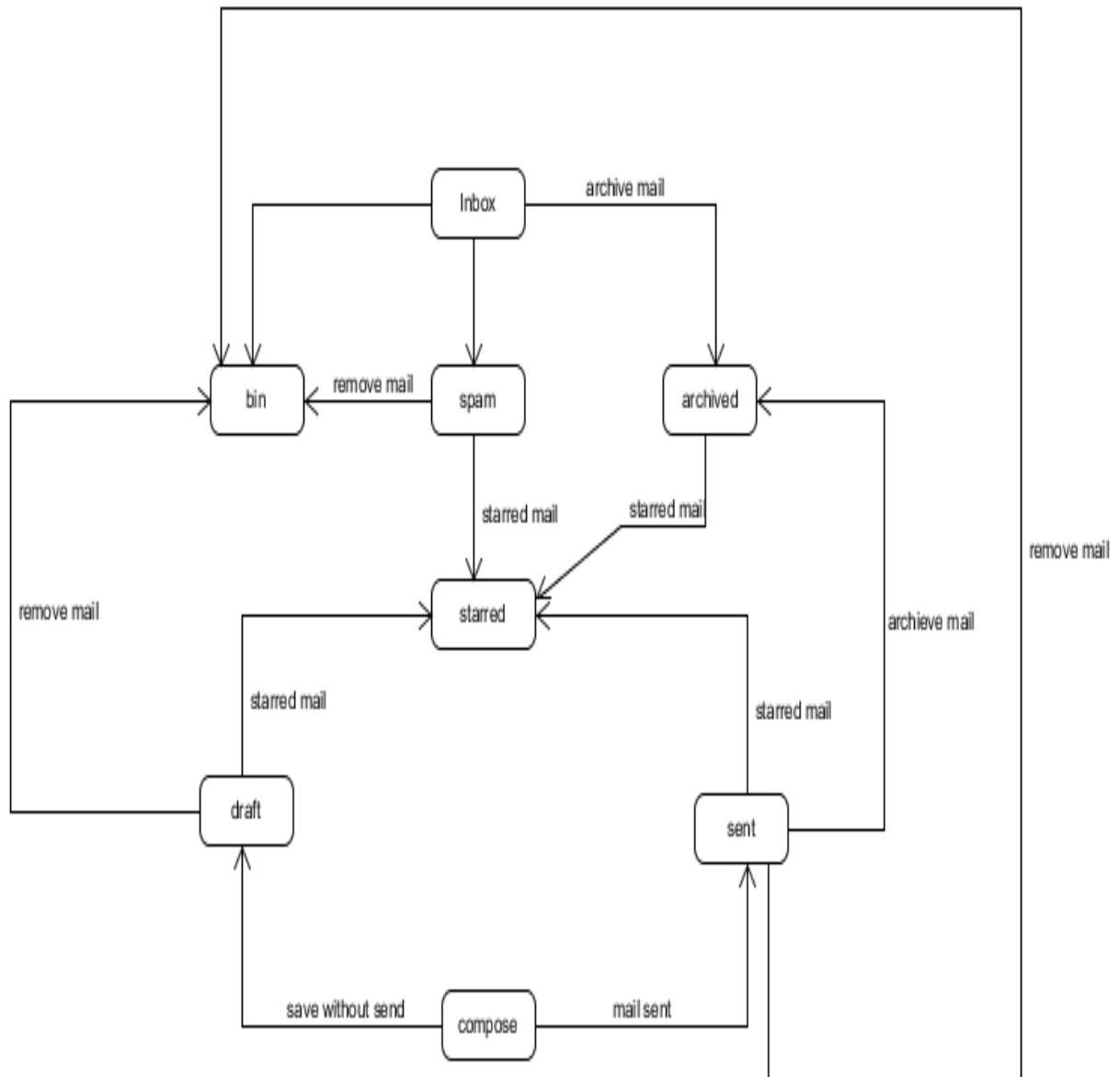
4.4.2: Upload Content
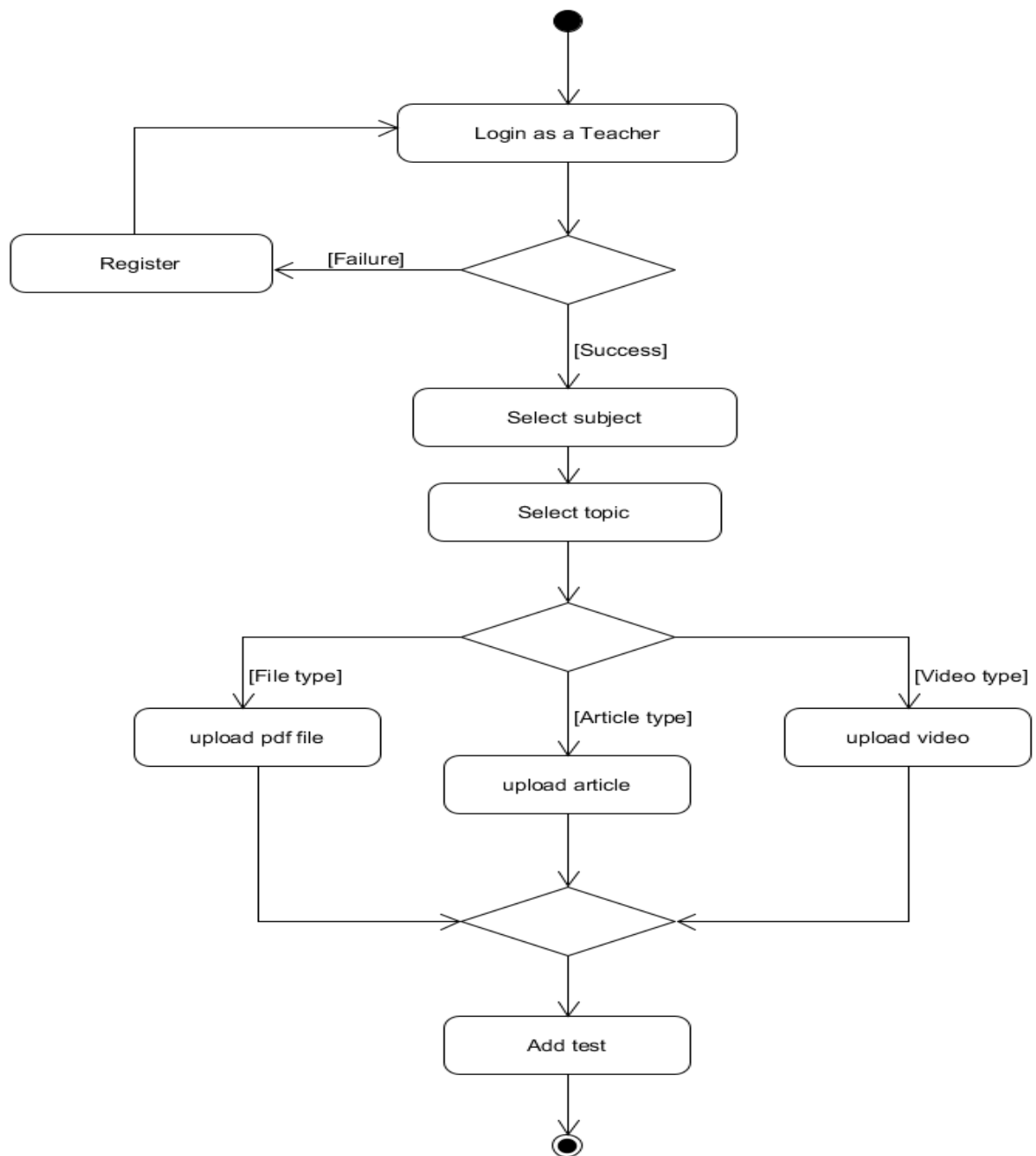
4.4.3: Explore Contents

4.5: State Diagram

4.5.1: Mail

4.6: ER Diagram
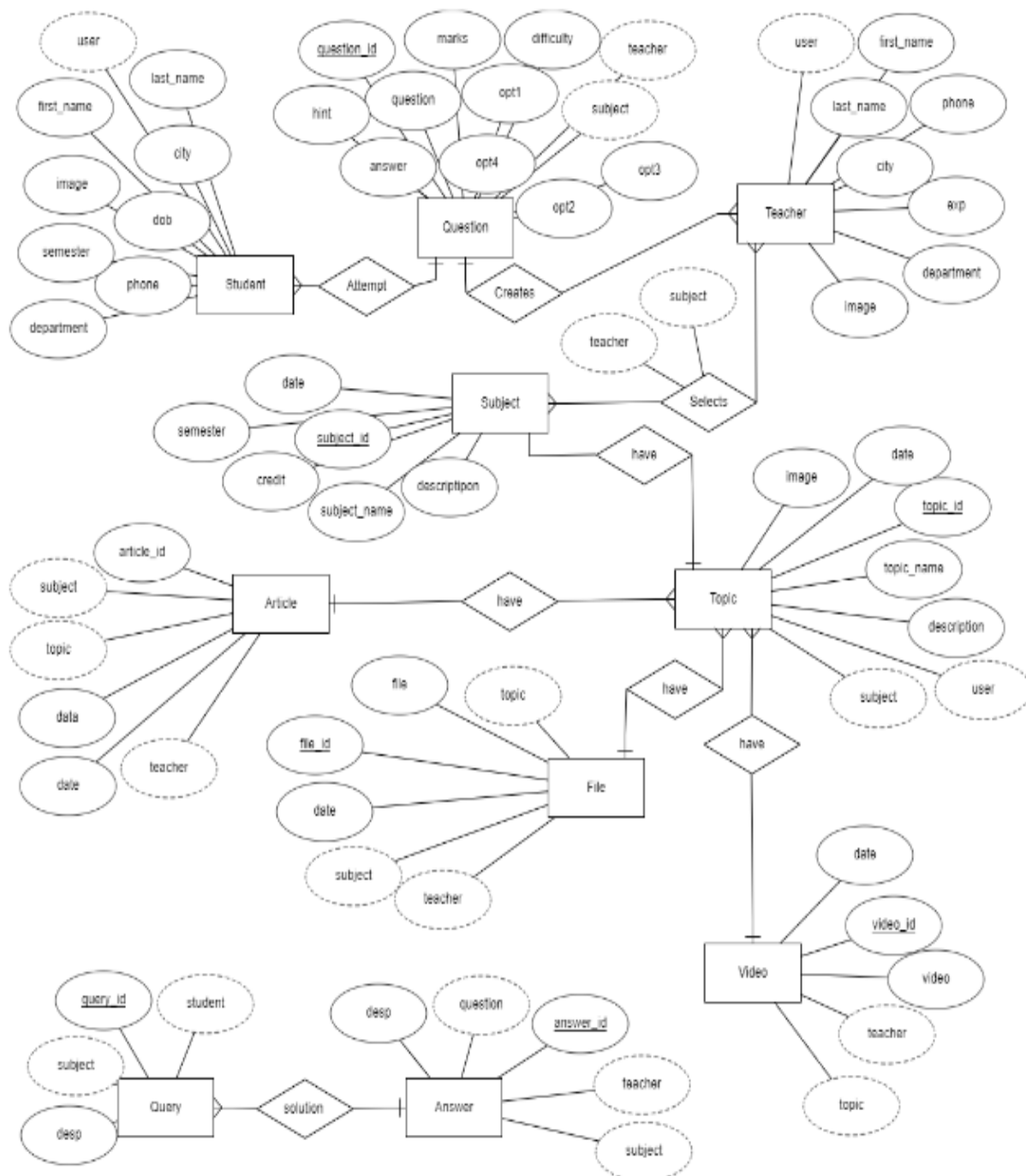
4.7: Data Dictionary

1. Article

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	article_id	autofield	1000	yes	yes	pk		Integer auto increment
2	date	DateTime	10	yes	no			Automatic taken
3	data	charfield	1000	yes	no			
4	topic	Textfield	100	yes	no	Fk	Topic	
5	teacher	Textfield	100	yes	no	Fk	Teacher	
6	subject	Textfield	100	yes	no	Fk	Subject	

2. Question

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	question_id	autofield	1000	yes	yes	pk		Integer auto increment
2	question	charfield	300	yes	no			
3	opt1	charfield	100	no	no			
4	opt2	charfield	100	no	no			
5	opt3	charfield	100	no	no			
6	opt4	charfield	100	no	no			
7	answer	charfield	100	yes	no			
8	hint	charfield	500	yes	no			
9	marks	Integerfield	1	yes	no			
10	difficulty	Integerfield	1	yes	no			
11	teacher	Textfield	100	yes	no	FK	Teacher	
12	subject	Textfield	100	yes	no	Fk	Subject	

3. Query

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	query_id	autofield	1000	yes	yes	pk		Integer auto increment
2	desp	Textfield	1000	yes	no			
3	student	Textfield	100	yes	no	Fk	Student	
4	subject	Textfield	100	yes	no	Fk	Subject	

4. Answer

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	answer_id	autofield	1000	yes	yes	pk		Integer auto increment
2	desp	Textfield	1000	yes	no			
3	teacher	Textfield	100	yes	no	Fk	Teacher	
4	subject	Textfield	100	yes	no	Fk	Subject	
5	question	Textfield	100	yes	no	Fk	Query	

5.File

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	file_id	autofield	1000	yes	yes	pk		Integer auto increment
2	file	filefield	0	yes	no			Upload to static folder named media
3	date	DateTime	10	yes	no			Automatic taken
4	teacher	Textfield	100	yes	no	Fk	Teacher	
5	subject	Textfield	100	yes	no	Fk	Subject	
6	topic	Textfield	100	yes	no	Fk	Topic	

6.Subject

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	subject_id	autofield	1000	yes	yes	pk		Integer auto increment
2	subject_name	Textfield	100	yes	no			
3	date	DateTime	10	yes	no			Automatic taken
4	semester	Integerfield	1	yes .	no		Teacher	
5	credit	floatfield	1	no	no		Subject	
6	description	Textfield	500	no	no		Topic	

7.Topic

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	topic_id	autofield	1000	yes	yes	pk		Integer auto increment
2	topic_name	charfield	100	yes	no			
3	date	DateTime	10	yes	no			Automatic taken
4	data	Textfield	1000	yes	no			
5	image	floatfield	0	no	no			
6	description	Textfield	500	no	no			
7	user	Textfield	100	yes	no	Fk	User	Django provision user table
8	subject	Textfield	100	yes	no	Fk	Subject	

8.Student

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	first_name	charfield	100	yes	yes			
2	last_name	charfield	100	yes	no			
3	phone	charfield	10	yes	no			
4	city	charfield	100	yes	no			
5	dob	datefield	10	yes	no			
6	department	charfield	100	yes	no			default is computer dept.
7	semester	Integerfield	1	yes	no			
8	image	imagefield	0	no	no			
9	user	Textfield	100	yes	no	Fk	User	Django provision user table

9.Teacher

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	first_name	charfield	100	yes	yes			
2	last_name	charfield	100	yes	no			
3	phone	charfield	10	yes	no			
4	city	charfield	100	yes	no			
5	exp	charfield	100	yes	no			
6	department	charfield	100	yes	no			
7	image	imagefield	0	no	no			
8	user	Textfield	100	yes	no	Fk	User	Django provision user table

10.TeacherManager

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	teacher	Textfield	100	yes	yes	FK	Teacher	To provide multiple choices of subjects
2	subject	Textfield	100	yes	yes	FK	Subject	

11.Video

Sr No.	Field Name	Datatype	Width	Required	Unique	Pk/Fk	Ref. table	Description
1	video_id	autofield	1000	yes	yes	pk		Integer auto increment
2	video	filefield	0	yes	no			Upload to static folder named media
3	date	DateTime	10	yes	no			Automatic taken
4	teacher	Textfield	100	yes	no	Fk	Teacher	
5	subject	Textfield	100	yes	no	Fk	Subject	
6	topic	Textfield	100	yes	no	Fk	Topic	

5. Implementation Detail

5.1: Modules

- **Articles**

  Articles modules provide CRUD operation of the articles. so List of articles is useful for only students and other three operation can be done by teachers.

- **Exam**

  Exam module is useful for only teacher which require adding question with options and hardness level.

- **Faq**

  Faq module is useful to student by asking the query to teacher and then teacher can answer the query of students.

- **Home**

  It is only for the home page and basically no backend logic is there in home module.

- **Material**

  Teachers can upload file content using this module and students can view and read the uploaded files by teachers.

- **Media**

  Django provides static storage module called media which provides to store items like images, video, file.

- **Result**

  Calculations of test results and provide test score to student are done using result module.

- **Subjects**

  List of all subjects and brief and detailed description of subjects are provided by it. Topics description of particular subject is provided by this module.

- **Users**

  Registration, mail, login and forget password functionality are provided by users' module.

- **Videos**

  Video content are handled by this module.

5.2: Functions

- **Login**

  It is the basic function for authentication. Login function validates credentials and if it is correct then authorizarization will be performed as per student or teacher.

- **Register**

  At first time teacher or students have to register their selves. They have to provide required credentials and then they access the application further.

- **Mail**

After registration successfully mail will be provided and mail is also helpful to send otp in the case of forget password.

- **Verify**

  Verify function validate the answer and calculate the result for the student and displays the result. It is located in result module.

- **Answer**

  Answer function provide functionality to teachers for giving answer the asked queries and provide solutions.

- **Upload File**

  It provides functionality to teacher the upload content in the form of the files.

- **Take**

  Take function take the subject name and creates the test for that subject.

- **Upload video**

  It provides functionality to teacher the upload content in the form of the video.

- **Show Video**

  Students can see the uploaded video content of all subjects.

- **Set**

  It is useful to set the new password after forgetting password via mail functionality.

6. Testing

6.1: Unit Testing

Python Django provides better way of testing. After combining all application. We can generate web application. Application can be tested using unit testing. We can check models using make migrations and migrate. Django also provides way to alter the field in models.py.

6.2: Integration Testing

After combining application web application needed to be tested. Whole web application can be tested after entering the different types of data. Application also tested login as different users like teacher and student. We solved some issues and break of the application.

6.3: Test Cases

1. Login as a student

2. Login as a teacher

3. Django Administration

7. Screen shots
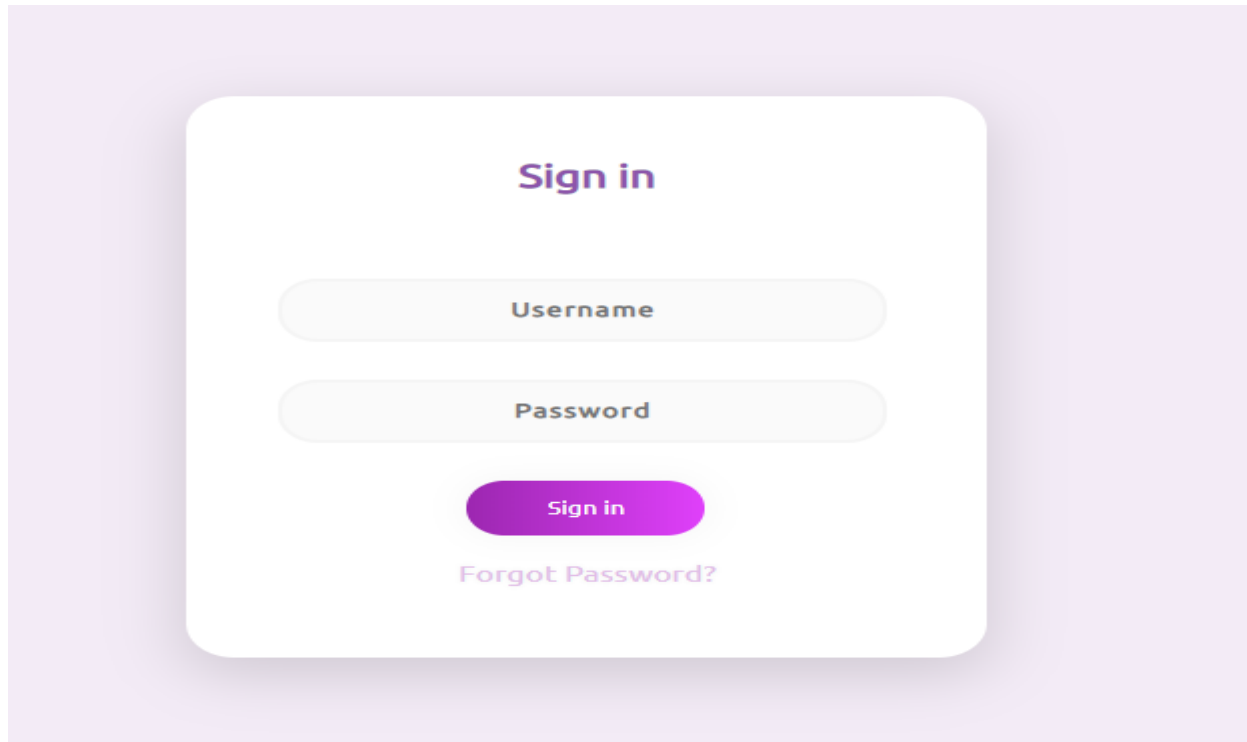
Home / Course / Question / solutions / Articles

Create Test

Create question for the test

CreateTest

Upload Documents

Upload file format

UploadFile

Upload Videos

Your Task

Join Today

First name*

Last name*

City

Phone

Dob

Department

Semester*

6

Image*

Choose File   No file chosen

mongodb

Test   Videos   Content

bigdata

Test   Videos   Content

Environmental Science

Test   Videos   Content

what is the round in AES?

○ 2

○ 5

○ 8

○ 10

what is the aes?

○ Decryption standard

○ encryption and decryption standard

○ algo for attack

○ Npne

what is the p in rabin algo?

○ less than 100

○ more than 100

○ prime

○ hello

What is the actual bit key in DES?

○ 64

○ 56

○ 48

○ 16

8. Conclusion

Online Learning Platform provides the intermediate role between students and teachers. System will be helpful to better understand basic fundamentals of subjects using graphical and video medium than traditional way of teaching. Student can study at any time anywhere so system provides portability. System provides different functions for different users are as follows:

8.1: Student's Functionalities

- Login
- Register
- Refer Subject
- Refer topics
- Read Articles
- Read File Content
- Show Video Content
- Attempt Test
- Search Articles
- Ask Queries
- Show Feeds
- Give Feedback
- Edit Profile

8.2: Teacher's Functionalities

- Login
- Register
- Subject Selection
- Add Topics
- Add Articles
- Add File Content
- Add Video Content
- Create Test
- Solve Queries
- Give Feedback
- Edit Profile

8.3: Admin's Functionalities

- Login
- Add subject
- Manage users
- Manage feedback
- Remove teachers

9. Limitations and Future Enhancements

9.1: Limitations:

We have only implemented for Computer Engineering. We are not implemented different versions and level of tests. We also don't have the dashboard. We don't provide the facility of downloading files or video, only reading or watching is allowed. Our application need more amount of data stores on server side so we need to shift our database on server which provides better maintainability and scalability.

9.2 Future Enhancements:

- We will extend our application for all courses on the large scale with some Machine Learning.
- We will also allow some more functionality to student like downloading video and files, bookmarks, various versions of tests and notification on new updates at our application. We will also implement the dashboard and progressive graph for students. We will provide different types of level in education and tests. Some of the above functionalities will be paid and basic functionality will be provided as free.
- We will hire best tutor for our application. We will also pay salary to them. We will provide some to do tasks to faculties. Tutors have to make an assignment, personal attention on students. Different versions of tests also will be implemented by the tutor and analysis of student's process report also done by our application.

10. Reference / Bibliography

- Following links and websites were referred during the development of this project.
- https://www.google.co.in
- http://www.getbootstrap.com
- http://www.w3schools.com
- http://www.stackoverflow.com
- https://docs.djangoproject.com/en/3.0/
- https://github.com/search?q=corey+schafer