Course Code: CSE-404

Course Title: Software Engineering and ISD Lab

Experiment No:03

Experiment Title: Logical design and data modeling of Online Based Education System

Submitted By:

Group No:07

Group Members:

Class Roll	Name
340	Sajia Bintea Jahangir
345	Fariha Rahman
358	Sayeda Parvin

Submitted to:
Dr Mohammad Zahidur Rahman
Professor
Department of Computer Science and Engineering
Jahangirnagar University
Dr Md. Humayun Kabir
Professor
Department of Computer Science and Engineering
Jahangirnagar University

1. Introduction:

It is an online-based education system designed to facilitate course enrollment and quiz administration. It aims to provide an interactive platform that enables learners to access educational courses, interact with educators, and participate in quizzes to assess their understanding and knowledge retention. It focuses on creating a user-friendly interface that enhances the learning experience and promotes effective evaluation.

2. Objectives:

The main objectives of 'Online Based Education System' are as follows:

- Provide learners with a wide range of courses covering diverse subjects and topics.
- Enable learners to easily enroll in courses of their choice and access course materials.
- Facilitate effective communication and interaction between learners and educators.
- Administer quizzes to assess learners' comprehension and progress.
- Deliver immediate feedback and performance evaluation to learners after quiz completion.
- Track learners' progress and provide personalized recommendations for further learning.

3. User Management:

User Registration: Users can create an account by providing their personal information and credentials.
User Authentication: Verify user identity through login credentials.
User Profiles: Users can manage their profiles, including personal information, profile picture, and preferences.

4. Course Management:

Course Creation: Instructors can create new courses by providing course details, objectives, and curriculum.
Course Enrollment: Users can enroll in courses they are interested in.
Course Progress Tracking: Track the progress of users in each enrolled course, including completed lessons, quizzes, and assignments.
Course Ratings and Reviews: Users can rate and review courses they have completed.

5. Content Delivery:

Lesson Materials: Instructors can upload various types of content such as text, images, videos, and presentations for each lesson.
Discussion Forums: Users can participate in course-specific discussion forums to interact with instructors and fellow learners.
Notifications: Users receive notifications about new lessons, announcements, and upcoming deadlines.

6. Assessment and Feedback:

Quizzes and Assignments: Instructors can create quizzes and assignments to assess the understanding and progress of learners.
Automated Grading: Implement automated grading for objective-based quizzes, while subjective assignments are manually graded.
Feedback and Grades: Provide learners with feedback and grades on their performance in quizzes and assignments.

7. Communication:

Messaging System: Users can communicate with each other and instructors through a messaging system.
Announcements: Instructors can send course announcements to all enrolled learners.
Support: Users can seek technical and administrative support through a support ticket system.

8. Payment and Billing:

Course Pricing: Instructors can set prices for their courses.
Payment Gateway Integration: Integrate with a secure payment gateway to handle course purchases and transactions.
Billing History: Users can view their payment history, invoices, and receipts.

9. ER Diagram

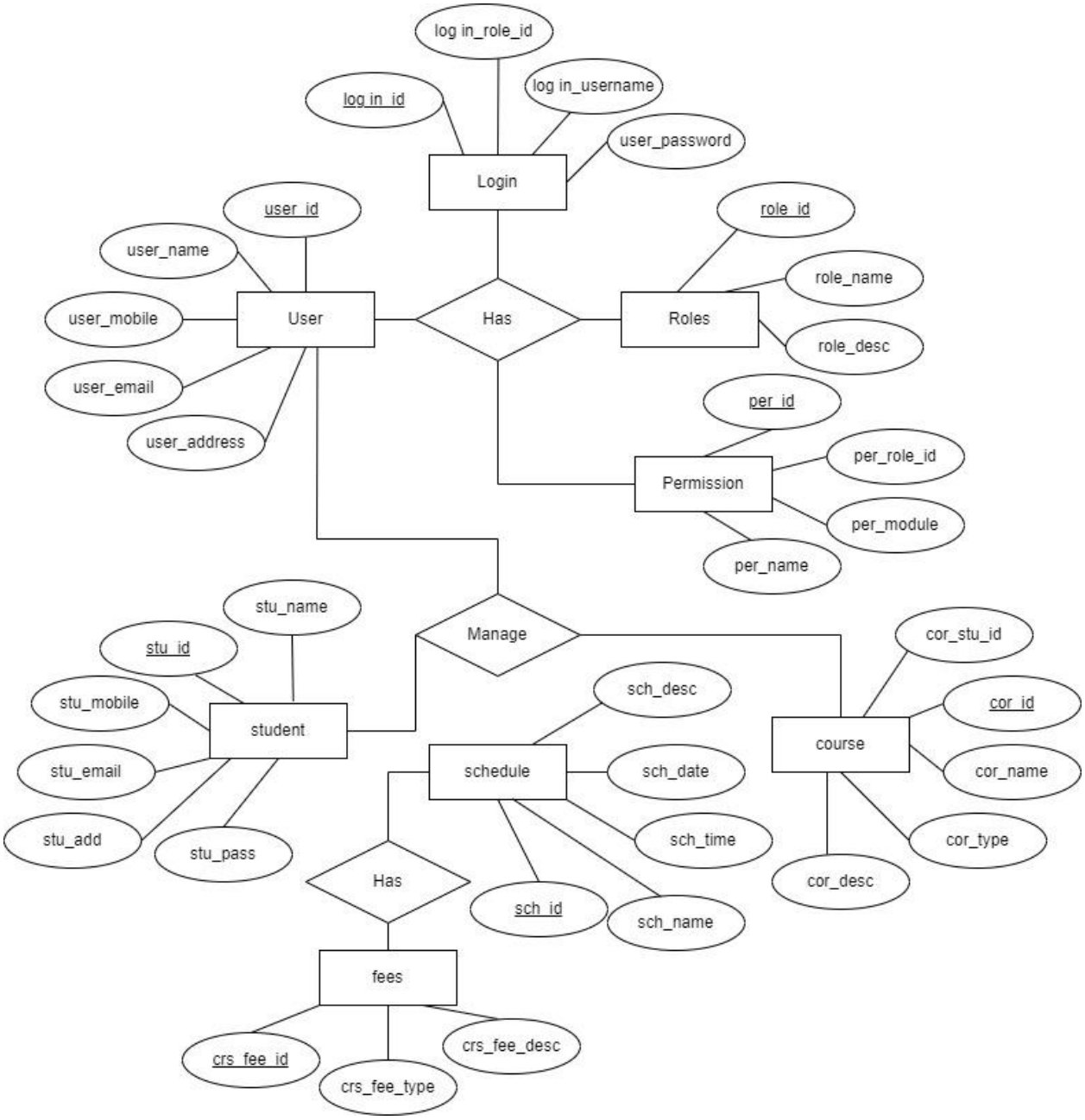


Fig: ER Diagram of Online Based Education System

10. Database Schema with keys

```
CREATE TABLE users (
  id INT NOT NULL AUTO_INCREMENT,
  username VARCHAR(255) NOT NULL,
  email VARCHAR(255) NOT NULL,
  password VARCHAR(255) NOT NULL,
  created_at DATETIME NOT NULL,
  updated_at DATETIME NOT NULL,
  PRIMARY KEY (id)
);

CREATE TABLE courses (
  id INT NOT NULL AUTO_INCREMENT,
  name VARCHAR(255) NOT NULL,
  description VARCHAR(255) NOT NULL,
  created_at DATETIME NOT NULL,
  updated_at DATETIME NOT NULL,
  PRIMARY KEY (id)
);

CREATE TABLE lessons (
  id INT NOT NULL AUTO_INCREMENT,
  course_id INT NOT NULL,
  title VARCHAR(255) NOT NULL,
  description VARCHAR(255) NOT NULL,
  content TEXT NOT NULL,
  created_at DATETIME NOT NULL,
  updated_at DATETIME NOT NULL,
  PRIMARY KEY (id),
  FOREIGN KEY (course_id) REFERENCES courses (id)
);

CREATE TABLE assignments (
  id INT NOT NULL AUTO_INCREMENT,
  lesson_id INT NOT NULL,
  title VARCHAR(255) NOT NULL,
  description VARCHAR(255) NOT NULL,
  due_date DATETIME NOT NULL,
  created_at DATETIME NOT NULL,
  updated_at DATETIME NOT NULL,
```

```
  PRIMARY KEY (id),
  FOREIGN KEY (lesson_id) REFERENCES lessons (id)
);

CREATE TABLE submissions (
  id INT NOT NULL AUTO_INCREMENT,
  assignment_id INT NOT NULL,
  user_id INT NOT NULL,
  content TEXT NOT NULL,
  grade INT NOT NULL,
  created_at DATETIME NOT NULL,
  updated_at DATETIME NOT NULL,
  PRIMARY KEY (id),
  FOREIGN KEY (assignment_id) REFERENCES assignments (id),
  FOREIGN KEY (user_id) REFERENCES users (id)
);

CREATE TABLE grades (
  id INT NOT NULL AUTO_INCREMENT,
  assignment_id INT NOT NULL,
  user_id INT NOT NULL,
  grade INT NOT NULL,
  created_at DATETIME NOT NULL,
  updated_at DATETIME NOT NULL,
  PRIMARY KEY (id),
  FOREIGN KEY (assignment_id) REFERENCES assignments (id),
  FOREIGN KEY (user_id) REFERENCES users (id)
);

CREATE TABLE notifications (
  id INT NOT NULL AUTO_INCREMENT,
  user_id INT NOT NULL,
  title VARCHAR(255) NOT NULL,
  message VARCHAR(255) NOT NULL,
  created_at DATETIME NOT NULL,
  updated_at DATETIME NOT NULL,
  PRIMARY KEY (id),
  FOREIGN KEY (user_id) REFERENCES users (id)
);
```

Here is a brief explanation of the purpose of each table:

1. Users table: This table stores information about the users of the online education system.
2. Courses table: This table stores information about the courses that are available in the online education system.
3. Lessons table: This table stores information about the lessons that are included in each course.
4. Assignments table: This table stores information about the assignments that are assigned to users in each lesson.
5. Submissions table: This table stores information about the submissions that users make for each assignment.
6. Grades table: This table stores information about the grades that users receive for their assignments.
7. Notifications table: This table stores information about the notifications that are sent to users.

This is just a basic schema, and it can be expanded or modified to meet the specific needs of our online education system.

11. Conclusion:

The logical design and data modeling outlined above provides an entity relationship(ER) diagram for developing online based education systems, focusing on different relationships between entities and attributes as the main features. Further design and implementation details would be required to bring the system to life.

Course Code : CSE - 404

Software Engineering and ISD Lab

Project Name : Online Based Education System

Experiment No : 03

Experiment Name : Logical Design and Data Modeling.

Group - 07

Group Members :

1) 345 — Faniha Rahman
2) 340 — Safia Bintea Jahangir
3) 358 — Sayeda Parvin

Submitted To :

1) Dr. Md Humayun Kabir
   Professor
   Department of CSE, JU

2) Dr. Mohammad Zahidur Rahman
   Professor
   Department of CSE, JU

Name : Jagia
Roll : 340
Group : 07

Experiment NO :- 03

Experiment Name :- Logical design and data modeling of Online based Education System.

1. Users Management :

Users Registation :

Users can create an account by providing their personal information and credentials.

Users Authentication :

Verify users identify through login credintials

Users Profiles :

Users can manage their profiles, including personal information, profile picture and preferences

2. Course Management :

Course creation : Instructors can create new courses details, objective, and curriculum.

Course Enrollment :

Users can enroll in courses they interested in

Course Progress Tracking :

Track the progress of users in each enrolled

Course, including completed lessons, quizzes and assignments.

Course Rating and Reviews:

Users can rate and review courses they have completed.

3. Content Delivery:

Lesson Materials:

Instructors can upload various types of content such as text, images, videos, and presentations for each lesson.

Discussion Forum:

Users can participate in course specific discussion forums to interact with instructors and fellow learners.

Notification:

Users can participate in course specific discussion forum to intenet upcoming deadlines.

4. Assesment and feedback:

Quizzes and Assignment -

Instructors can create quizzes and assignments to assess the understanding and progress of learners.

• Automatic Grading:

Implement automated grading for objective-based quizzes, while subjective assignments are manually graded.

Feedback and Grades:

Provide learners with feedback and grades on their performance in quizzes and assignments.

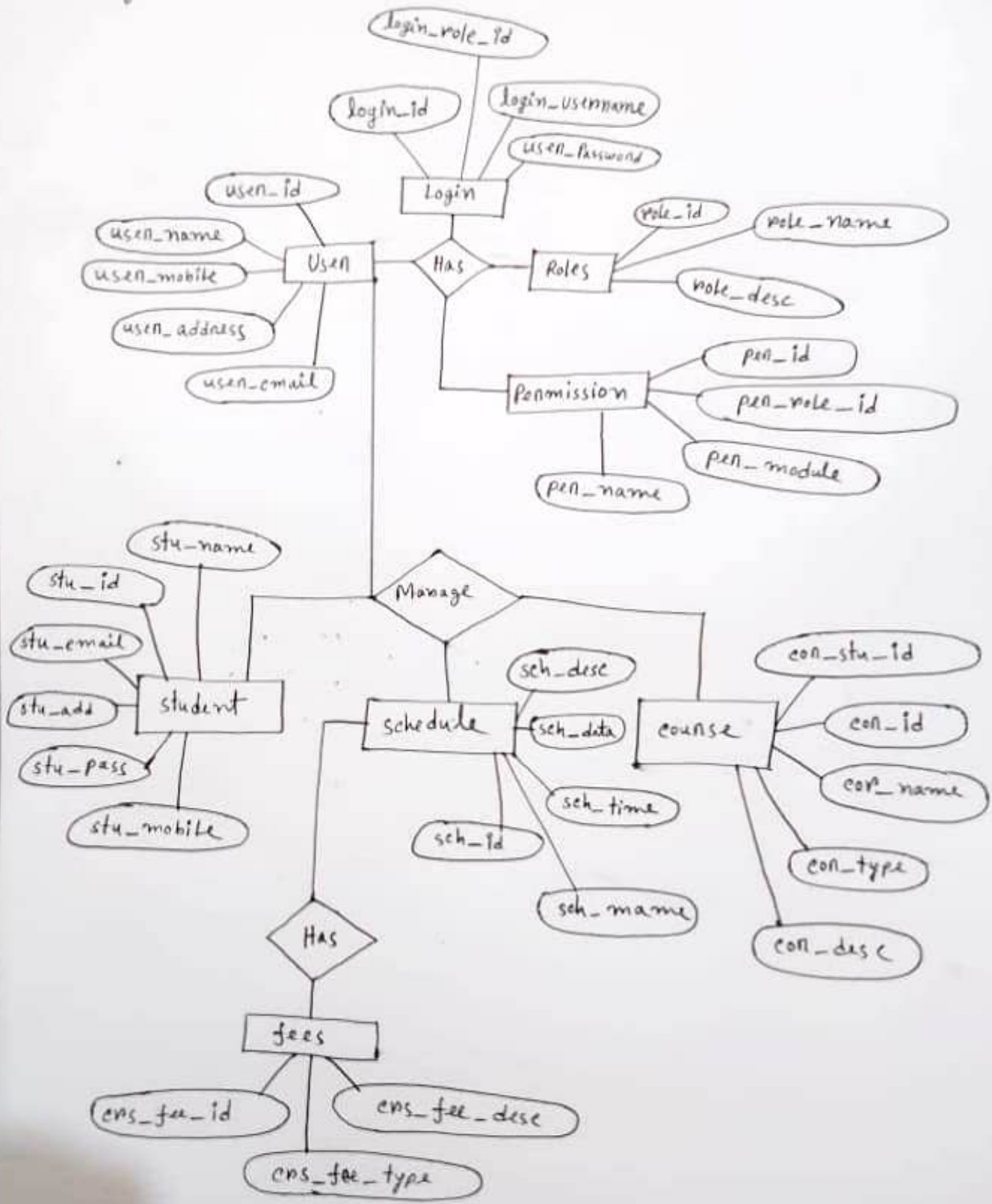
Communication:

Messaging system
Announcement
Support
Payment and billing

Name: Sayeda Parvin
Roll: 358
Date: 08-06-23

Experiment No: 03
Experiment Name: Logical design and data modeling of Online Based Education System

- ER Diagram:-



Name: Fariha Rahman
ID: 345
Exam Roll: 191327

Project Name: Online Based Education system
Experiment No: 03
Experiment Name: Logical design and Data Modeling of our project using Tools

Group: 07

Database Schemas with Keys:

```
Create database Online_Education;
use Online_Education;
create table users(
  id int not null auto_increment,
  username varchar(255) not null,
  email varchar(255) not null,
  password varchar(255) not null,
  created_at datetime not null,
  updated_at datetime not null,
  primary key(id)
);
create table courses(
  id int not null auto_increment,
  name varchar(255) not null,
  description varchar(255) not null,
  created_at datetime not null,
```

```
    updated_at datetime not null,
    primary key(id)
);

create table lessons(
    id int not null auto_increment,
    course_id int not null,
    title varchar(255) not null,
    description varchar(255) not null,
    content text not null,
    created_at datetime not null,
    updated_at datetime not null,
    primary key (id),
    foreign key (course_id) references courses(id)
);

create table assignments(
    id int not null auto_increment,
    lesson_id int not null,
    title varchar(255) not null,
    description varchar(255) not null,
    due_date datetime not null,
    created_at datetime not null,
    updated_at datetime not null,
```

```
    primary key(id),
    foreign key (lesson_id) references lessons(id)
);

create table submissions (
    id int not null auto_increment,
    assignment_id int not null,
    user_id int not null,
    content text not null,
    grade int not null,
    created_at datetime not null,
    updated_at datetime not null,
    primary key(id),
    foreign key (assignment_id) references
                                assignments(id),
    foreign key (user_id) references users(id)
);

create table grades (
    id int not null auto_increment,
    assignment_id int not null,
    user_id int not null,
    grade int not null,
```

```
    created_at datetime not null,
    updated_at datetime not null,
    primary key (id),
    foreign key (assignment_id) references
                                assignments (id),
    foreign key (user_id) references users (id)
);

create table notifications (
    id int not null auto_increment,
    user_id int not null,
    title varchar(255) not null,
    message varchar(255) not null,
    primary key (id),
    foreign key (user_id) references users (id)
);
```

Here is a brief explanation of the purpose of each table:

1. Users table: This table stores information about the users of the online education system.

2. Courses table: This table stores information about the courses.

3. Lessons table: This table stores information about the lessons

4. Assignments table: This table stores information about the assignments

5. Submissions table: This table stores information about the submissions that users makes for each assignment.

6. Grades table: This table stores information about the ~~ma~~ grads that users receive for their assignments

7. Notifications table: This table stores information about the notifications that are sent to users.

This is just a basic schema, and it can be expanded on modified to meet the specific needs of our ~~online~~ online education system.