Lab Assessment – 3

Learning Management System

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Course Title: Software Engineering Lab

1. ER Diagram

To develop a structural model of the **Learning Management System** using an Entity-Relationship Diagram (ERD), we need to:

1. Identify key entities
2. Define attributes for each entity
3. Establish relationships between entities

Step 1: Identify key entities

Users

1) Educator: A person who sets up different online courses available for taking.

2) Student: A user who wants to enrol and take the courses.

Step 2: Define attributes for Each Entity

User (UserID, Name, Email, Password)

Course (CourseID, Title, Description, EducatorID)

Enrollment (EnrollmentID, UserID (FK), CourseID (FK), EnrolledAt)

Quiz (QuizID, CourseID (FK), Title, CreatedAt)

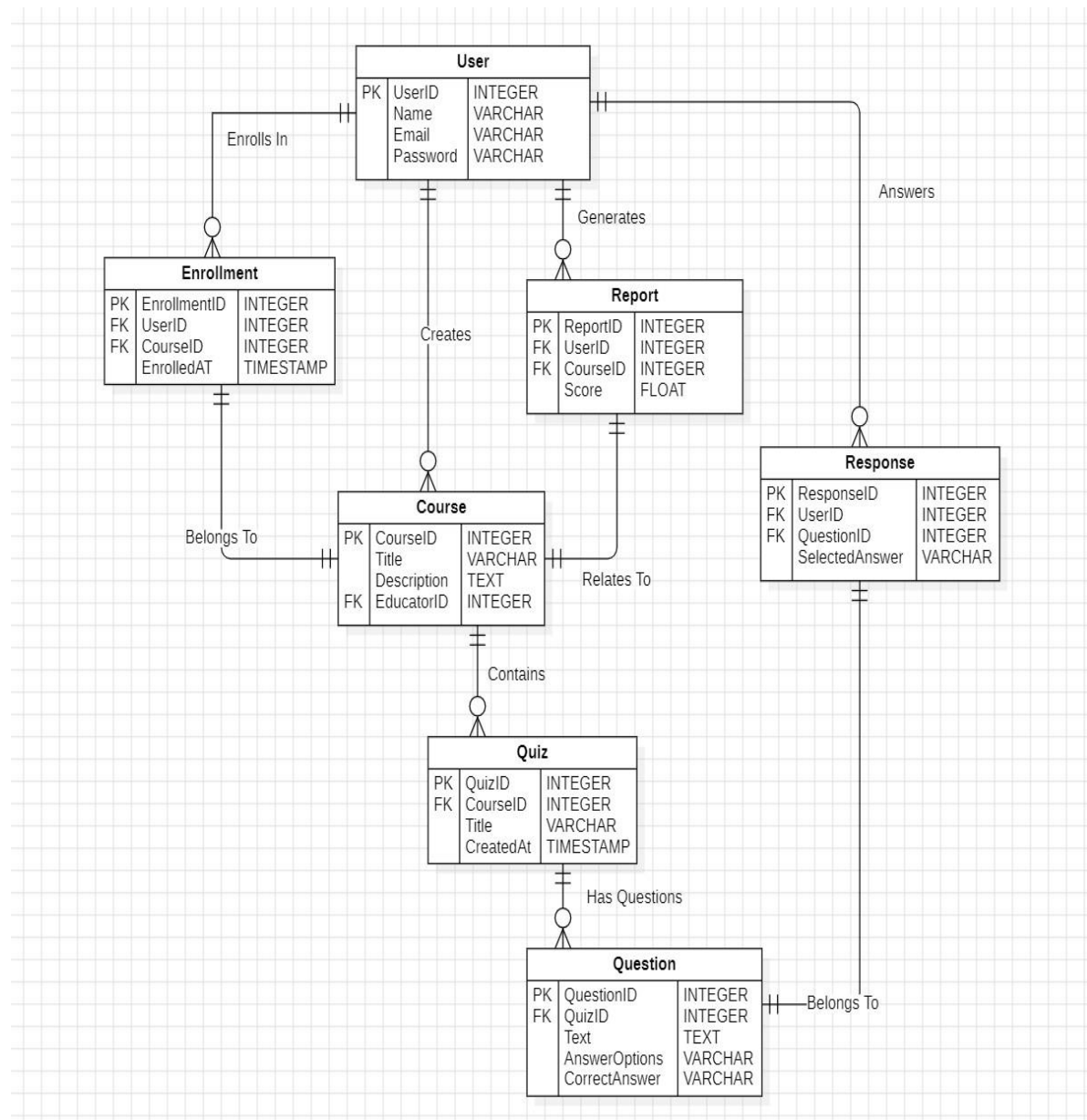**Question** (QuestionID, QuizID (FK), Text, AnswerOptions, CorrectAnswer)

Response (ResponseID, UserID (FK), QuestionID (FK), SelectedAnswer)

Report (ReportID, UserID (FK), CourseID (FK), Score)

Step 3 Define Attributes for Each Entity

Entity 1	Entity 2	Relationship	Type
User	Course	A User (Educator) can create multiple Courses, but each Course is created by only one Educator.	One-to-Many (1:M)
User	Enrollment	A User (Student) can enroll in multiple Courses, and a Course can have multiple enrolled Students.	Many-to-Many (M:N) (Resolved using the Enrollment table)
Course	Quiz	A Course can have multiple Quizzes, but each Quiz belongs to only one Course.	One-to-Many (1:M)
Quiz	Question	A Quiz can have multiple Questions, but each Question belongs to one Quiz.	One-to-Many (1:M)
User	Response	A User (Student) submits multiple Responses, but each Response belongs to only one User.	One-to-Many (1:M)
Question	Response	Each Question can have multiple Responses (from different Students), but each Response is linked to only one Question.	One-to-Many (1:M)
User	Report	A User (Student) has one Report per Course, but a Report belongs to only one User.	One-to-Many (1:M)
Course	Report	A Course can have multiple Reports (one per Student), but each Report is linked to one Course.	One-to-Many (1:M)

Step 3 Define Attributes for Each Entity

Entity Relationship Diagram (ERD)

User

PK	UserID	INTEGER
	Name	VARCHAR
	Email	VARCHAR
	Password	VARCHAR

Enrolls In

Generates

Answers

Creates

Enrollment

PK	EnrollmentID	INTEGER
FK	UserID	INTEGER
FK	CourseID	INTEGER
	EnrolledAT	TIMESTAMP

Report

PK	ReportID	INTEGER
FK	UserID	INTEGER
FK	CourseID	INTEGER
	Score	FLOAT

Response

PK	ResponseID	INTEGER
FK	UserID	INTEGER
FK	QuestionID	INTEGER
	SelectedAnswer	VARCHAR

Belongs To

Course

PK	CourseID	INTEGER
	Title	VARCHAR
	Description	TEXT
FK	EducatorID	INTEGER

Relates To

Contains

Quiz

PK	QuizID	INTEGER
FK	CourseID	INTEGER
	Title	VARCHAR
	CreatedAt	TIMESTAMP

Has Questions

Question

PK	QuestionID	INTEGER
FK	QuizID	INTEGER
	Text	TEXT
	AnswerOptions	VARCHAR
	CorrectAnswer	VARCHAR

Belongs To

2. UI/UX Diagram

Active Learning

Active Learning

Available Learning

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