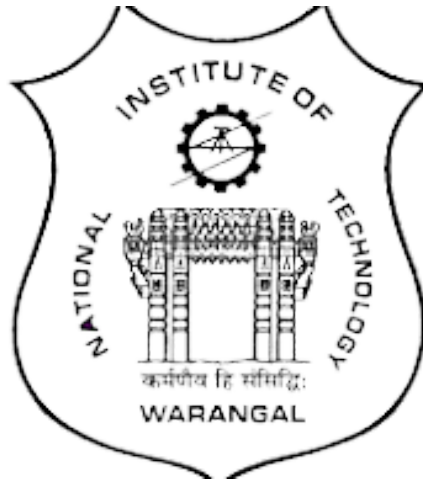


NATIONAL INSTITUTE OF TECHNOLOGY WARANGAL

(AN INSTITUTE OF NATIONAL IMPORTANCE)



DBMS PROJECT :

ONLINE QUIZ AND ASSESSMENT SYSTEM

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INTRODUCTION

This project aims to create an Online Quiz and Assessment System that transforms how quizzes, exams, students submissions, grading, and analytics are handled. It serves as a robust platform for educational institutions, training centers, and organizations needing an efficient way to manage assessments.

The system's main goal is to provide an intuitive interface for educators to create various types of assessments, from multiple-choice to essay-based questions. Students can access assessments online, submit answers, and receive instant feedback based on grading criteria.

Key features include a comprehensive database to securely store user profiles, course details, assessment content, submission records, grading , and analytical data. This centralized database ensures data integrity, accessibility, and scalability for managing large volumes of assessment-related information.

Overall, this Online Quiz and Assessment System aims to enhance the assessment experience for educators and students by providing a comprehensive solution for creating, managing, grading, and analyzing assessments in a digital and data-driven environment.

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SQL

Tables

1. USER TABLE

Store details about User who has been participating in Quiz

ATTRIBUTE	DATATYPE	CONSTRAINTS
USER_ID	INTEGER	PRIMARY KEY
EMAIL	VARCHAR	NOT NULL
USERNAME	VARCHAR	NOT NULL
PASSWORD	VARCHAR	NOT NULL
USER_TYPE	VARCHAR	NOT NULL

2. QUIZ

Store details of Quiz in which users are going to participate

ATTRIBUTE	DATATYPE	CONSTRAINTS
QUIZ_ID	INTEGER	PRIMARY KEY
QUIZ_NAME	VARCHAR	NOT NULL
DESCRIPTION	VARCHAR	NOT NULL
DATE_CREATED	DATE	NOT NULL

3. QUESTION

Stores details of Question type i.e, question text , question id and Quiz id

ATTRIBUTE	DATATYPE	CONSTRAINTS
QUES_ID	INTEGER	PRIMARY_KEY
QUES_TEXT	VARCHAR	NOT NULL
QUIZ_ID	INTEGER	FOREIGN_KEY

4. ANSWER

Store details of answer that is attempted by participant for given questions.

ATTRIBUTE	DATATYPE	CONSTRAINTS
ANS_ID	INTEGER	PRIMARY_KEY
ANS_TEXT	VARCHAR	NOT NULL
IS_CORRECT	VARCHAR	NOT NULL

5. RESULT

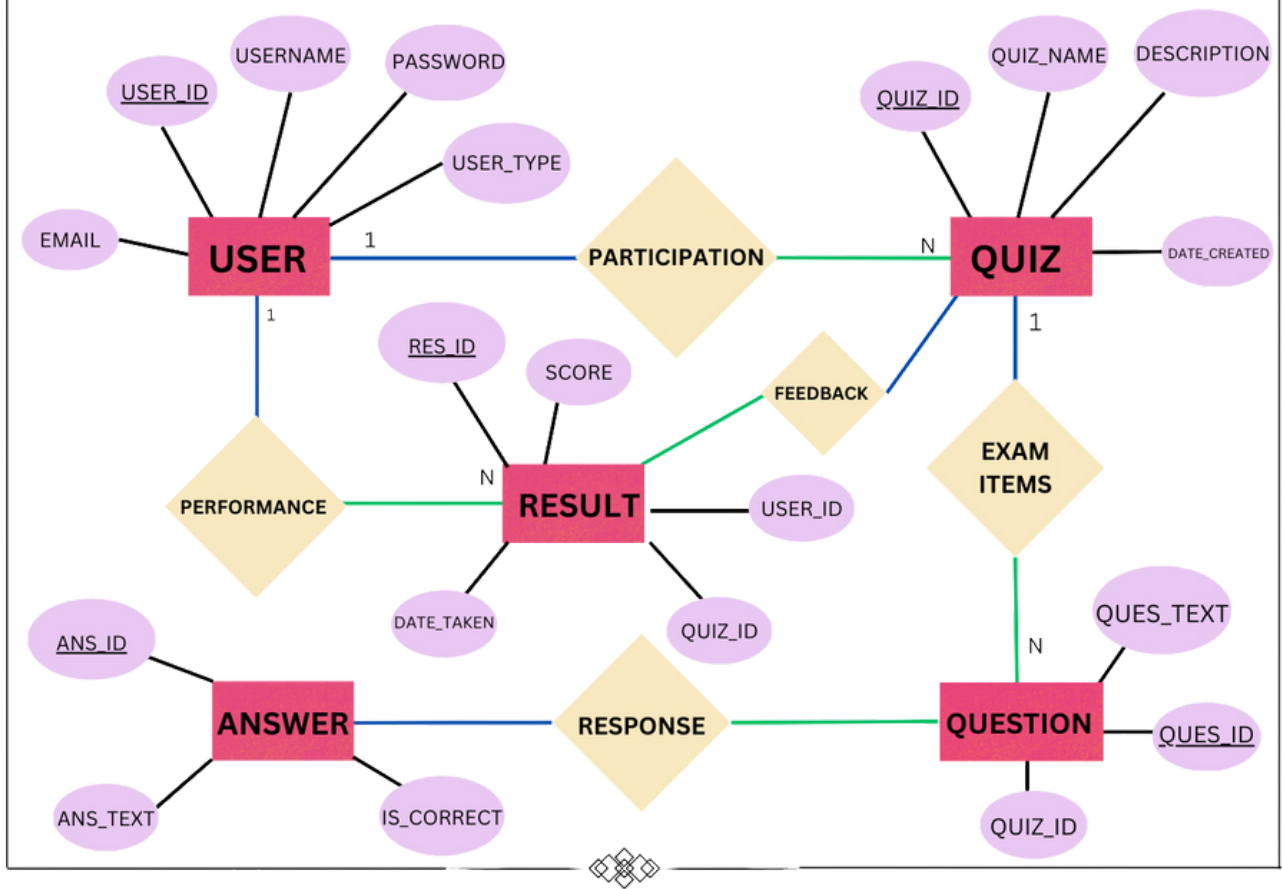
Store results of Users whoever participated in Quiz i.e, there score

ATTRIBUTE	DATATYPE	CONSTRAINTS
RES_ID	INTEGER	PRIMARY KEY
SCORE	INTEGER	NOT NULL
USER_ID	INTEGER	FOREIGN KEY
QUIZ_ID	INTEGER	FOREIGN KEY
DATE_TAKEN	DATE	NOT NULL

ER Model Assumptions

- Users can participate in multiple quizzes and each quiz can have multiple participants. This is reflected in the relationship between the USER and QUIZ entities, And it is uniquely identified by USER_ID .
- Each quiz can have multiple questions and each question can belong to one quiz. This is shown by the one-to-many relationship between QUIZ and QUESTION, And is uniquely identified by QUIZ_ID .
- An answer record exists for each user's response to a question. The ANSWER entity likely has a foreign key relationship with both USER and QUESTION entities, and may include attributes such as the user's answer text and whether it was correct , And it is uniquely identified by ANS_ID.
- A RESULT entity uniquely identified by RES_ID stores information about each user's performance in a quiz. This entity allows users to access their scores, the specific QUIZ_ID they attempted, and the date (Date/Time) they took the quiz.

ER DIAGRAM



FUNCTIONAL DEPENDENCIES AND **PRIMARY KEY**

- **USER**

USER (**USER_ID (Pk)** , Email , Username , Password , User_Type
Since all the fields depend on USER_ID , (USER_ID) \rightarrow R
Hence , USER_ID is a Primary Key

- **QUIZ**

QUIZ (**QUIZ_ID (Pk)** , Quiz_name , Description , Date_Created
Since all the fields depend on QUIZ_ID , (QUIZ_ID) \rightarrow R
Hence , QUIZ_ID is a Primary Key

- **QUESTION**

QUES_ID(**QUES_ID (Pk)** , Ques_text , Quiz_id
Since all the fields depend on QUES_ID , (QUES_ID) \rightarrow R
Hence , QUES_ID is a Primary Key

- **ANSWER**

ANS_ID(**ANS_ID (Pk)** , Ans_text , Is_Correct
Since all the fields depend on ANS_ID , (ANS_ID) \rightarrow R
Hence , ANS_ID is a Primary Key

- **RESULT**

RES_ID(**RES_ID (Pk)** , Score , User_Id , Quiz_Id , Date_Taken
Since all the fields depend on RES_ID , (RES_ID) \rightarrow R
Hence , RES_ID is a Primary Key

NORMALIZATION

1. USER:

Primary key : USER_ID

All attributes depend on the USER_ID, hence the table is in 2NF.

All attributes depend directly on the USER_ID, hence the table is in 3NF.

All determinants (USER_ID) are candidate keys, hence the table is in BCNF.

2. QUIZ:

Primary key : QUIZ_ID

All attributes depend on the QUIZ_ID, hence the table is in 2NF.

All attributes depend directly on the QUIZ_ID, hence the table is in 3NF.

All determinants (QUIZ_ID) are candidate keys, hence the table is in BCNF.

3. QUESTION:

Primary key : QUES_ID

All attributes depend on the QUES_ID, hence the table is in 2NF.

All attributes depend directly on the QUES_ID, hence the table is in 3NF.

All determinants (QUES_ID) are candidate keys, hence the table is in BCNF.

4. ANSWER

Primary key : ANS_ID

All attributes depend on the ANS_ID, hence the table is in 2NF.

All attributes depend directly on the ANS_ID, hence the table is in 3NF.

All determinants (ANS_ID) are candidate keys, hence the table is in BCNF.

5. RESULT

Primary key : RES_ID

All attributes depend on the RES_ID, hence the table is in 2NF.

All attributes depend directly on the RES_ID, hence the table is in 3NF.

All determinants (RES_ID) are candidate keys, hence the table is in BCNF.

RELATIONSHIP SCHEMA:

***PARTICIPATION**

Being a one-to-many relationship between user and quiz, it is merged with the quiz table by having UserID as its foreign key.

***EXAM ITEMS**

Being a one-to-many relationship between quiz and question, it is merged with the question table by having QuizID as its foreign key.

***RESPONSE**

Being a one-to-many relationship between question and answer, it is merged with the answer table by having QuestionID as its foreign key.

***PERFORMANCE**

Being a one-to-many relationship between user and result, it is merged with the result table by having UserID as its foreign key.

***FEEDBACK**

Being a one-to-many relationship between result and quiz, it is merged with the result table by having QuizID as its foreign key.

SQL CODE:

```
CREATE TABLE USER
```

```
(  
    USER_ID INTEGER PRIMARY KEY,  
    EMAIL VARCHAR(100),  
    USERNAME VARCHAR(100),  
    PASSWORD VARCHAR(100),  
    USER_TYPE VARCHAR(100)  
);
```

```
CREATE TABLE QUIZ
```

```
(  
    QUIZ_ID INTEGER PRIMARY KEY,  
    QUIZ_NAME VARCHAR(100),  
    DESCRIPTION VARCHAR(100),  
    DATE_CREATED DATE  
);
```

```
CREATE TABLE QUIZ
```

```
(  
    QUIZ_ID INTEGER PRIMARY KEY,  
    QUIZ_NAME VARCHAR(100),  
    DESCRIPTION VARCHAR(100),  
    DATE_CREATED DATE  
);
```

```
CREATE TABLE QUESTION
```

```
(  
    QUES_ID INTEGER PRIMARY KEY,  
    QUES_TEXT VARCHAR(100),  
    QUIZ_ID INTEGER,  
    FOREIGN KEY(QUIZ_ID) REFERENCES QUIZ(QUIZ_ID)  
);
```

```
CREATE TABLE RESULT
(
    RES_ID INTEGER PRIMARY KEY,
    SCORE INTEGER,
    USER_ID INTEGER,
    QUIZ_ID INTEGER,
    DATE_TAKEN DATE,
    FOREIGN KEY (USER_ID) REFERENCES USER(USER_ID),
    FOREIGN KEY (QUIZ_ID) REFERENCES QUIZ(QUIZ_ID)
);
```

INSERT VALUES:

```
INSERT INTO "USER" VALUES (01, 'xyz@gmail.com', 'XYZ', '@123', 'student');
INSERT INTO "USER" VALUES (02, 'abc@gmail.com', 'ABC', '@125', 'student');
INSERT INTO "USER" VALUES (03, 'MNC@gmail.com', 'MNC', '@127', 'student');
INSERT INTO "USER" VALUES (04, 'inst_1@gmail.com', 'INST1', '@210', 'instructor');
INSERT INTO "USER" VALUES (05, 'inst_2@gmail.com', 'INST2', '@220', 'instructor');
INSERT INTO "USER" VALUES (06, 'g1@gmail.com', 'guest_1', '@310', 'guest');
INSERT INTO "USER" VALUES (07, 'admin@gmail.com', 'admin_01', '@910', 'admin');
```

```
INSERT INTO "QUIZ" VALUES (1, 'Biology Basics Quiz', 'Test your knowledge of
fundamental concepts in biology. ', '2023-01-23');
INSERT INTO "QUIZ" VALUES (2, 'Geometry Challenge Quiz', 'Challenge yourself with
geometric shapes and properties.', '2023-02-23');
INSERT INTO "QUIZ" VALUES (3, 'Grammar Guru Quiz', 'Master grammar rules and
improve your language skills.', '2023-03-24');
INSERT INTO "QUIZ" VALUES (4, 'World History Timeline Quiz', 'Explore historical
events from different eras and civilizations.', '2024-04-20');
INSERT INTO "QUIZ" VALUES (5, 'Computer Basics Quiz', 'Test your understanding of
computer hardware and software.', '2024-05-02');
INSERT INTO "QUIZ" VALUES (6, 'Trivia Time Quiz', 'Have fun with a variety of
trivia questions from different categories.', '2024-06-12');
```

```
INSERT INTO "QUESTION" VALUES(11, 'What is the powerhouse of the cell?', 1),
INSERT INTO "QUESTION" VALUES(12, 'Solve for x:  $2x + 5 = 15$ ', 2),
INSERT INTO "QUESTION" VALUES(13, 'Identify the correct use of "their" in a
sentence. ', 3),
INSERT INTO "QUESTION" VALUES(14, 'When did the Industrial Revolution begin?', 4),
INSERT INTO "QUESTION" VALUES(15, 'What is RAM?', 5),
INSERT INTO "QUESTION" VALUES(16, 'Who is the author of "Harry Potter" series?',
6);
```



```
INSERT INTO "ANSWER" VALUES(21, 'Mitochondria','Yes');
INSERT INTO "ANSWER" VALUES(22, '21', 'No');
INSERT INTO "ANSWER" VALUES(23, 'It is their house.','Yes');
INSERT INTO "ANSWER" VALUES(24, '1760', 'Yes');
INSERT INTO "ANSWER" VALUES(25, 'Random-Access-Memory', 'Yes');
INSERT INTO "ANSWER" VALUES(26, 'Einstein', 'No');
```

```
INSERT INTO "RESULT" VALUES(901, 90, 201 , 1, '2023-01-24');
INSERT INTO "RESULT" VALUES(902, 82, 202, 2 , '2023-03-24');
INSERT INTO "RESULT" VALUES(903, 85, 203, 3 , '2023-03-24');
INSERT INTO "RESULT" VALUES(904, 95, 204, 4 , '2024-04-20');
INSERT INTO "RESULT" VALUES(905, 80, 205, 5, '2024-05-02');
INSERT INTO "RESULT" VALUES(906, 70, 206, 6, '2024-06-12');
```

TABLES AFTER CREATION:

USER

USER_ID	EMAIL	USERNAME	PASSWORD	USER_TYPE
201	xyz@gmail.com	XYZ	@123	student
202	abc@gmail.com	ABC	@125	student
203	MNC@gmail.com	MNC	@127	student
204	inst_1@gmail.com	INST1	@210	instructor
205	inst_2@gmail.com	INST2	@220	instructor
206	gl@gmail.com	guest_1	@310	guest
207	admin@gmail.com	admin_01	@910	admin

QUIZ

QUIZ_ID	QUIZ_NAME	DESCRIPTION	DATE_CREATED
1	Biology Basics Quiz	Test your knowledge of fundamental concepts in biology.	2023-01-23
2	Geometry Challenge Quiz	Challenge yourself with geometric shapes and properties.	2023-02-23
3	Grammar Guru Quiz	Master grammar rules and improve your language skills.	2023-03-24
4	World History Timeline Quiz	Explore historical events from different eras and civilizations.	2024-04-20
5	Computer Basics Quiz	Test your understanding of computer hardware and software.	2024-05-02
6	Trivia Time Quiz	Have fun with a variety of trivia questions from different categories.	2024-06-12

QUESTION

QUES_ID	QUES_TEXT	QUIZ_ID
11	What is the powerhouse of the cell?	1
12	Solve for x: $2x + 5 = 15$	2
13	Identify the correct use of "their" in a sentence.	3
14	When did the Industrial Revolution begin?	4
15	What is RAM?	5
16	Who is the author of "Harry Potter" series?	6

ANSWER

ANS_ID	ANS_TEXT	IS_CORRECT
21	Mitochondria	Yes
22	21	No
23	It is their house.	Yes
24	1760	Yes
25	Random-Access-Memory	Yes
26	Einstein	No

RESULT

RES_ID	SCORE	USER_ID	QUIZ_ID	DATE_TAKEN
901	90	201	1	2023-01-24
902	82	202	2	2023-03-24
903	85	203	3	2023-03-24
904	95	204	4	2024-04-20
905	80	205	5	2024-05-02
906	70	206	6	2024-06-12