Online Quiz Management System

(Case Study Presentation)

Presented By:

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Introduction

- **Brief Overview** - Essential tool in **educational** and **training** environments. They are provides a platform for **creating, managing, and analysing** quizzes efficiently.
- **Aim** - To design and implement an Online Quiz Management System that allows users to take quizzes, manage questions and options, and track scores effectively.

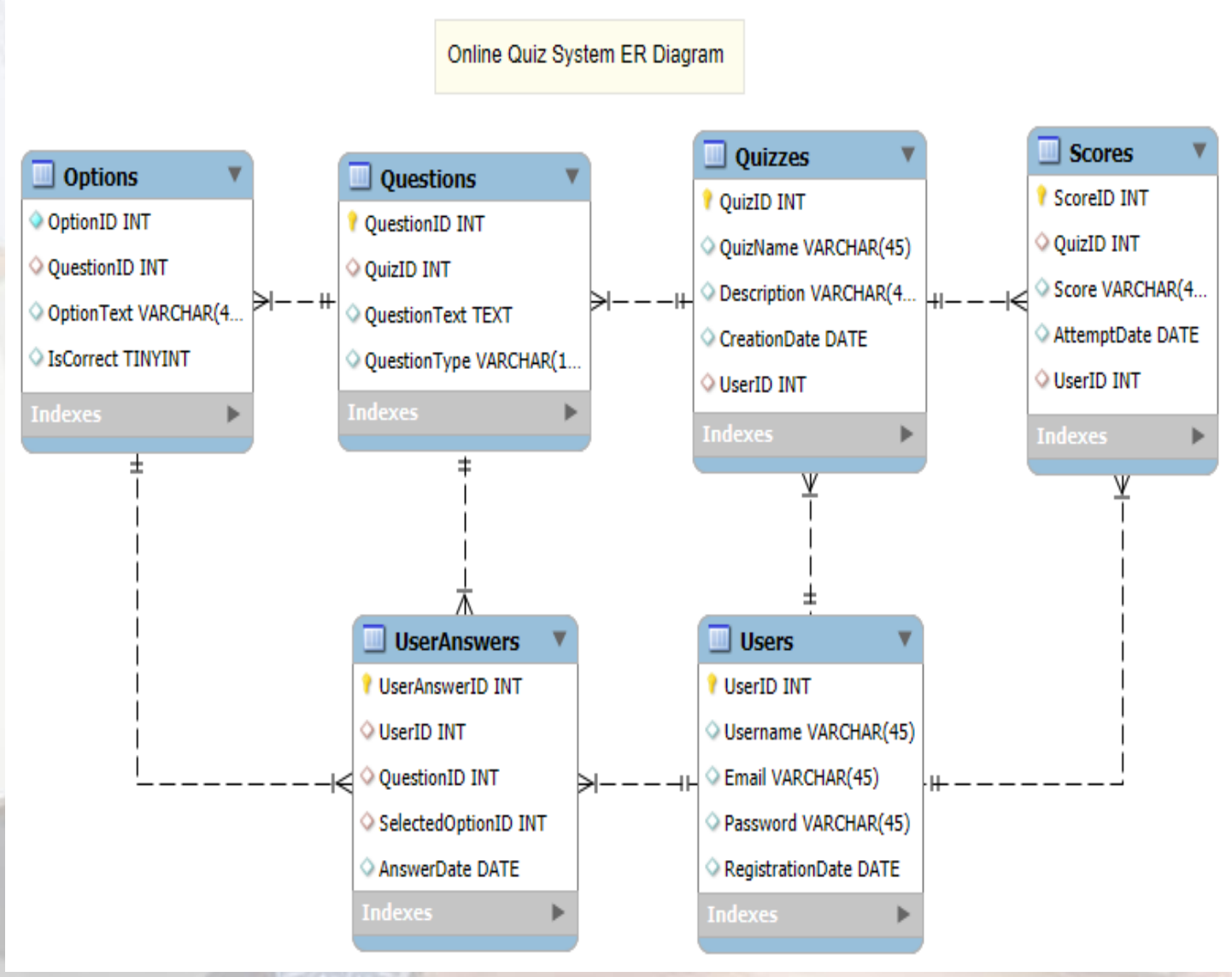
Objectives

- To design a relational database schema for the quiz management system.
- To implement the database using SQL.
- To populate the database with sample data.
- To perform various SQL queries to demonstrate system functionality.

System Overview

- **System Components**: Users, Quizzes, Questions, Options, UserAnswers, and Scores.
- Key functionalities of each component.
  - **Users** : Manage user information
  - **Quizzes :** Create and manage **quiz details** such as name, description, and creation date.
  - **Questions :** Store questions associated with quizzes, including question text and type.
  - **Options :** Provide 4 options for each question, indicating the correct answer.
  - **UserAnswers :** Record **user responses** to quiz questions.
  - **Scores :** Track **user scores** for each quiz attempt.

ER Diagram



- Diagram should show the relationships between Users, Quizzes, Questions, Options, UserAnswers, and Scores.
  1. **Users and Quizzes**:One-to-Many relationship (one user can create many quizzes).
  2. **Quizzes and Questions**:One-to-Many relationship (one quiz can have many questions).
  3. **Questions and Options**:One-to-Many relationship (one question can have many options).
  4. **Users and UserAnswers**:One-to-Many relationship (one user can provide many answers).
  5. **Questions and UserAnswers**:One-to-Many relationship (one question can have many answers).
  6. **Options and UserAnswers**:One-to-Many relationship (one option can be selected in many user answers).
  7. **Users and Scores**:One-to-Many relationship (one user can have many scores).
  8. **Quizzes and Scores**:One-to-Many relationship (one quiz can have many scores).

Database Schema

- The database schema was created using SQL statements to define tables and relationships:

Users

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default
UserID	int	NO	PRI	NULL
Username	varchar(100)	YES		NULL
Email	varchar(100)	YES		NULL
Password	varchar(100)	YES		NULL
RegistrationDate	date	YES		NULL

UserAnswers

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
UserAnswerID	int	NO	PRI	NULL	
UserID	int	YES	MUL	NULL	
QuestionID	int	YES	MUL	NULL	
SelectedOptionID	int	YES	MUL	NULL	
AnswerDate	date	YES		NULL	

Options

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
OptionID	int	NO	PRI	NULL	
QuestionID	int	YES	MUL	NULL	
OptionText	varchar(255)	YES		NULL	
IsCorrect	tinyint(1)	YES		NULL	

Scores

Result Grid | Filter Rows: | Export: | Wrap

Field	Type	Null	Key	Default	Extra
ScoreID	int	NO	PRI	NULL	
UserID	int	YES	MUL	NULL	
QuizID	int	YES	MUL	NULL	
Score	decimal(5,2)	YES		NULL	
AttemptDate	date	YES		NULL	

Quizzes

Result Grid | Filter Rows: | Export: | Wrap

Field	Type	Null	Key	Default	Extra
QuizID	int	NO	PRI	NULL	
QuizName	varchar(100)	YES		NULL	
Description	text	YES		NULL	
UserID	int	YES	MUL	NULL	
CreationDate	date	YES		NULL	

Questions

Result Grid | Filter Rows: | Export: | Wrap

Field	Type	Null	Key	Default	Extra
QuestionID	int	NO	PRI	NULL	
QuizID	int	YES	MUL	NULL	
QuestionText	text	YES		NULL	
QuestionType	varchar(50)	YES		NULL	

Key SQL Queries

1. Table Creation

Users

```
CREATE TABLE Users (
UserID INT PRIMARY KEY,
Username VARCHAR(100),
Email VARCHAR(100),
Password VARCHAR(100),
RegistrationDate DATE
);
```

Quizzes

```
CREATE TABLE Quizzes (
QuizID INT PRIMARY KEY,
QuizName VARCHAR(100),
Description TEXT,
UserID INT,
CreationDate DATE,
FOREIGN KEY (UserID) REFERENCES Users(UserID)
);
```

Questions

```
CREATE TABLE Questions (
QuestionID INT PRIMARY KEY,
QuizID INT,
QuestionText TEXT,
QuestionType VARCHAR(50),
FOREIGN KEY (QuizID) REFERENCES Quizzes(QuizID)
);
```

Key SQL Queries

1. Table Creation

Options

```
CREATE TABLE Options (
    OptionID INT PRIMARY KEY,
    QuestionID INT,
    OptionText VARCHAR(255),
    IsCorrect BOOLEAN,
    FOREIGN KEY (QuestionID) REFERENCES Questions(QuestionID)
);
```

UserAnswers

```
CREATE TABLE UserAnswers (
    UserAnswerID INT PRIMARY KEY,
    UserID INT,
    QuestionID INT,
    SelectedOptionID INT,
    AnswerDate DATE,
    FOREIGN KEY (UserID) REFERENCES Users(UserID),
    FOREIGN KEY (QuestionID) REFERENCES Questions(QuestionID),
    FOREIGN KEY (SelectedOptionID) REFERENCES Options(OptionID)
);
```

Scores

```
CREATE TABLE Scores (
    ScoreID INT PRIMARY KEY,
    UserID INT,
    QuizID INT,
    Score DECIMAL(5,2),
    AttemptDate DATE,
    FOREIGN KEY (UserID) REFERENCES Users(UserID),
    FOREIGN KEY (QuizID) REFERENCES Quizzes(QuizID)
);
```

Key SQL Queries

2. Inserting Records

Users (Total Records : 10)

```
INSERT INTO Users (UserID, Username, Email, Password, RegistrationDate) VALUES(1, 'Alice', 'alice@example.com', 'password1', '2024-01-01'),(2, 'Bob', 'bob@example.com', 'password2', '2024-01-02'),(3, 'Charlie', 'charlie@example.com', 'password3', '2024-01-03'),(4, 'David', 'david@example.com', 'password4', '2024-01-04'),(5, 'Eve', 'eve@example.com', 'password5', '2024-01-05'),(6, 'Frank', 'frank@example.com', 'password6', '2024-01-06'),(7, 'Grace', 'grace@example.com', 'password7', '2024-01-07'),(8, 'Hank', 'hank@example.com', 'password8', '2024-01-08'),(9, 'Ivy', 'ivy@example.com', 'password9', '2024-01-09'),(10, 'Jack', 'jack@example.com', 'password10', '2024-01-10');
```

Key SQL Queries

2. Inserting Records

Quizzes (Total Records : 10)

```
INSERT INTO Quizzes (QuizID, QuizName, Description, UserID, CreationDate) VALUES(1, 'General
Knowledge Quiz', 'A quiz to test your general knowledge.', 1, '2024-01-11'),
(2, 'Science Quiz', 'A quiz to test your science knowledge.', 2, '2024-01-12'),
(3, 'History Quiz', 'A quiz to test your history knowledge.', 3, '2024-01-13'),
(4, 'Math Quiz', 'A quiz to test your math knowledge.', 4, '2024-01-14'),
(5, 'Literature Quiz', 'A quiz to test your literature knowledge.', 5, '2024-01-15'),
(6, 'Geography Quiz', 'A quiz to test your geography knowledge.', 6, '2024-01-16'),
(7, 'Music Quiz', 'A quiz to test your music knowledge.', 7, '2024-01-17'),
(8, 'Art Quiz', 'A quiz to test your art knowledge.', 8, '2024-01-18'),
(9, 'Sports Quiz', 'A quiz to test your sports knowledge.', 9, '2024-01-19'),
(10, 'Technology Quiz', 'A quiz to test your technology knowledge.', 10, '2024-01-20');
```

Key SQL Queries

3. Inserting Records

Questions (Total Records : 40)

```
INSERT INTO Questions (QuestionID, QuizID, QuestionText, QuestionType) VALUES(1, 1, 'What is the capital of France?', 'Multiple Choice'),(2, 1, 'Which planet is known as the Red Planet?', 'Multiple Choice'),(3, 1, 'Who wrote "To Kill a Mockingbird"?', 'Multiple Choice'),(4, 1, 'What is the smallest prime number?', 'Multiple Choice'),(5, 2, 'What is H2O?', 'Multiple Choice'),(6, 2, 'What is the speed of light?', 'Multiple Choice'),(7, 2, 'Who developed the theory of relativity?', 'Multiple Choice'),(8, 2, 'What is the chemical symbol for gold?', 'Multiple Choice'),(9, 3, 'Who was the first president of the United States?', 'Multiple Choice'),(10, 3, 'In what year did World War II end?', 'Multiple Choice'),(11, 3, 'What ancient civilization built the pyramids?', 'Multiple Choice'),(12, 3, 'Who was the first emperor of China?', 'Multiple Choice'),(13, 4, 'What is the value of Pi?', 'Multiple Choice'),(14, 4, 'What is 2 + 2?', 'Multiple Choice'),(15, 4, 'What is the square root of 16?', 'Multiple Choice'),(16, 4, 'What is the derivative of x^2?', 'Multiple Choice'),(17, 5, 'Who wrote "Hamlet"?', 'Multiple Choice'),(18, 5, 'Who wrote "Pride and Prejudice"?', 'Multiple Choice'),(19, 5, 'Who wrote "1984"?', 'Multiple Choice'),(20, 5, 'Who wrote "The Great Gatsby"?', 'Multiple Choice'),(21, 6, 'What is the capital of Canada?', 'Multiple Choice'),(22, 6, 'Which country is known as the Land of the Rising Sun?', 'Multiple Choice'),(23, 6, 'What is the largest ocean?', 'Multiple Choice'),(24, 6, 'Which continent is known as the Dark Continent?', 'Multiple Choice'),(25, 7, 'Who is known as the King of Pop?', 'Multiple Choice'),(26, 7, 'What instrument does Yo-Yo Ma play?', 'Multiple Choice'),(27, 7, 'Who composed the Four Seasons?', 'Multiple Choice'),(28, 7, 'Who is the lead singer of U2?', 'Multiple Choice'),(29, 8, 'Who painted the Mona Lisa?', 'Multiple Choice'),(30, 8, 'Who sculpted David?', 'Multiple Choice'),(31, 8, 'Who painted the Sistine Chapel?', 'Multiple Choice'),(32, 8, 'Who painted Starry Night?', 'Multiple Choice'),(33, 9, 'Who won the FIFA World Cup in 2018?', 'Multiple Choice'),(34, 9, 'Who has the most Olympic gold medals?', 'Multiple Choice'),(35, 9, 'Who is known as the Lightning Bolt?', 'Multiple Choice'),(36, 9, 'Who is the only athlete to play in both the World Series and the Super Bowl?', 'Multiple Choice'),(37, 10, 'Who founded Microsoft?', 'Multiple Choice'),(38, 10, 'What is the capital of Silicon Valley?', 'Multiple Choice'),(39, 10, 'Who is the CEO of Tesla?', 'Multiple Choice'),(40, 10, 'What does HTML stand for?', 'Multiple Choice');
```

Key SQL Queries

2. Inserting Records

Options (Total Records : 160)

```
INSERT INTO Options (OptionID, QuestionID, OptionText, IsCorrect) VALUES(1, 1, 'Paris', TRUE),(2, 1, 'London', FALSE),(3, 1, 'Berlin', FALSE),(4, 1, 'Rome', FALSE),(5, 2, 'Earth', FALSE),(6, 2, 'Mars', TRUE),(7, 2, 'Jupiter', FALSE),(8, 2, 'Venus', FALSE),(9, 3, 'Harper Lee', TRUE),(10, 3, 'J.K. Rowling', FALSE),(11, 3, 'Ernest Hemingway', FALSE),(12, 3, 'Jane Austen', FALSE),(13, 4, '1', FALSE),(14, 4, '2', TRUE),(15, 4, '3', FALSE),(16, 4, '4', FALSE),(17, 5, 'Water', TRUE),(18, 5, 'Oxygen', FALSE),(19, 5, 'Carbon Dioxide', FALSE),(20, 5, 'Helium', FALSE),(21, 6, '299,792 km/s', TRUE),(22, 6, '150,000 km/s', FALSE),(23, 6, '300,000 km/s', FALSE),(24, 6, '280,000 km/s', FALSE),(25, 7, 'Albert Einstein', TRUE),(26, 7, 'Isaac Newton', FALSE),(27, 7, 'Galileo Galilei', FALSE),(28, 7, 'Nikola Tesla', FALSE),(29, 8, 'Au', TRUE),(30, 8, 'Ag', FALSE),(31, 8, 'Pb', FALSE),(32, 8, 'Fe', FALSE),(33, 9, 'George Washington', TRUE),(34, 9, 'Abraham Lincoln', FALSE),(35, 9, 'Thomas Jefferson', FALSE),(36, 9, 'John Adams', FALSE),(37, 10, '1945', TRUE),(38, 10, '1918', FALSE),(39, 10, '1939', FALSE),(40, 10, '1950', FALSE),(41, 11, 'Egyptians', TRUE),(42, 11, 'Romans', FALSE),(43, 11, 'Greeks', FALSE),(44, 11, 'Mayans', FALSE),(45, 12, 'Qin Shi Huang', TRUE),(46, 12, 'Genghis Khan', FALSE),(47, 12, 'Kublai Khan', FALSE),(48, 12, 'Sun Tzu', FALSE),(49, 13, '3.14', TRUE),(50, 13, '2.71', FALSE),(51, 13, '1.62', FALSE),(52, 13, ..... (160, 40, 'HyperText Mockup Language', FALSE);
```

Key SQL Queries

2. Inserting Records

UserAnswers (Total Records : 40)

```
INSERT INTO UserAnswers (UserAnswerID, UserID, QuestionID, SelectedOptionID, AnswerDate)
VALUES(1, 1, 1, 1, '2024-01-21'),(2, 1, 2, 6, '2024-01-21'),(3, 1, 3, 9, '2024-01-21'),(4, 1, 4, 14, '2024-01-21'),(5, 2, 5, 17, '2024-01-22'),(6, 2, 6, 21, '2024-01-22'),(7, 2, 7, 25, '2024-01-22'),(8, 2, 8, 29, '2024-01-22'),(9, 3, 9, 33, '2024-01-23'),(10, 3, 10, 37, '2024-01-23'),(11, 4, 11, 41, '2024-01-24'),(12, 4, 12, 45, '2024-01-24'),(13, 4, 13, 49, '2024-01-24'),(14, 4, 14, 54, '2024-01-24'),(15, 5, 15, 58, '2024-01-25'),(16, 5, 16, 61, '2024-01-25'),(17, 5, 17, 65, '2024-01-25'),(18, 5, 18, 69, '2024-01-25'),(19, 6, 19, 73, '2024-01-26'),(20, 6, 20, 77, '2024-01-26'),(21, 6, 21, 81, '2024-01-26'),(22, 6, 22, 85, '2024-01-26'),(23, 7, 23, 89, '2024-01-27'),(24, 7, 24, 93, '2024-01-27'),(25, 7, 25, 97, '2024-01-27'),(26, 7, 26, 101, '2024-01-27'),(27, 8, 27, 105, '2024-01-28'),(28, 8, 28, 109, '2024-01-28'),(29, 8, 29, 113, '2024-01-28'),(30, 8, 30, 117, '2024-01-28'),(31, 9, 31, 121, '2024-01-29'),(32, 9, 32, 125, '2024-01-29'),(33, 9, 33, 129, '2024-01-29'),(34, 9, 34, 133, '2024-01-29'),(35, 10, 35, 137, '2024-01-30'),(36, 10, 36, 141, '2024-01-30'),(37, 10, 37, 145, '2024-01-30'),(38, 10, 38, 149, '2024-01-30'),(39, 10, 39, 153, '2024-01-30'),(40, 10, 40, 157, '2024-01-30');
```

Key SQL Queries

2. Inserting Records

Scores (Total Records : 10)

```
INSERT INTO Scores (ScoreID, UserID, QuizID, Score, AttemptDate)
VALUES(1, 1, 1, 4, '2024-01-21'),
(2, 2, 2, 4, '2024-01-22'),
(3, 3, 3, 2, '2024-01-23'),
(4, 4, 4, 3, '2024-01-24'),
(5, 5, 5, 3, '2024-01-25'),
(6, 6, 6, 4, '2024-01-26'),
(7, 7, 7, 4, '2024-01-27'),
(8, 8, 8, 4, '2024-01-28'),
(9, 9, 9, 4, '2024-01-29'),
(10, 10, 10, 5, '2024-01-30');
```

Key SQL Queries

3. Select Records: Write a query to select all quizzes created after January 1, 2024, from the Quizzes table.

```
SELECT * FROM Quizzes WHERE CreationDate > '2024-01-01';
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap C

QuizID	QuizName	Description	UserID	CreationDate
1	General Knowledge Quiz	A quiz to test your general knowledge.	1	2024-01-11
2	Science Quiz	A quiz to test your science knowledge.	2	2024-01-12
3	History Quiz	A quiz to test your history knowledge.	3	2024-01-13
4	Math Quiz	A quiz to test your math knowledge.	4	2024-01-14
5	Literature Quiz	A quiz to test your literature knowledge.	5	2024-01-15
6	Geography Quiz	A quiz to test your geography knowledge.	6	2024-01-16
7	Music Quiz	A quiz to test your music knowledge.	7	2024-01-17
8	Art Quiz	A quiz to test your art knowledge.	8	2024-01-18
9	Sports Quiz	A quiz to test your sports knowledge.	9	2024-01-19
10	Technology Quiz	A quiz to test your technology knowledge.	10	2024-01-20
NULL	NULL	NULL	NULL	NULL

Key SQL Queries

4. Where Clause (AND/OR):
Write a query to select all questions where the QuestionType is 'Multiple Choice' and the QuizID is 3.

```
SELECT * FROM Questions
WHERE QuestionType = 'Multiple Choice' AND QuizID = 3;
```

Result Grid | Filter Rows: | Edit: | Export/Import:

QuestionID	QuizID	QuestionText	QuestionType
9	3	Who was the first president of the United States?	Multiple Choice
10	3	In what year did World War II end?	Multiple Choice
11	3	What ancient civilization built the pyramids?	Multiple Choice
12	3	Who was the first emperor of China?	Multiple Choice
NULL	NULL	NULL	NULL

Key SQL Queries

4. <u>Where Clause (AND/OR):</u>
Write a query to select all questions where the QuestionType is 'Multiple Choice' and the QuizID is 3.

```
SELECT * FROM Questions WHERE
QuestionType = 'Multiple Choice' OR
QuizID = 3;
( Total Records : 40 )
```

QuestionID	QuizID	QuestionText	QuestionType
1	1	What is the capital of France?	Multiple Choice
2	1	Which planet is known as the Red Planet?	Multiple Choice
3	1	Who wrote "To Kill a Mockingbird"?	Multiple Choice
4	1	What is the smallest prime number?	Multiple Choice
5	2	What is H2O?	Multiple Choice
6	2	What is the speed of light?	Multiple Choice
7	2	Who developed the theory of relativity?	Multiple Choice
8	2	What is the chemical symbol for gold?	Multiple Choice
9	3	Who was the first president of the United States?	Multiple Choice
10	3	In what year did World War II end?	Multiple Choice
11	3	What ancient civilization built the pyramids?	Multiple Choice
12	3	Who was the first emperor of China?	Multiple Choice
13	4	What is the value of Pi?	Multiple Choice

Questions 3

Key SQL Queries

5. LIKE Operator: Write a query to select all quizzes where the QuizName contains 'General'.

```
SELECT * FROM Quizzes WHERE
QuizName LIKE '%General%';
```

	QuizID	QuizName	Description	UserID	CreationDate
▶	1	General Knowledge Quiz	A quiz to test your general knowledge.	1	2024-01-11
*	NULL	NULL	NULL	NULL	NULL

Key SQL Queries

6. CASE Statement : Write a query to select OptionText and a new column OptionStatus from the Options table. If IsCorrect is TRUE, set OptionStatus to 'Correct', otherwise 'Incorrect'.

```
SELECT OptionText, CASE  WHEN
IsCorrect = TRUE THEN 'Correct'
ELSE 'Incorrect' END AS OptionStatus
FROM Options;
( Total Records : 160)
```

OptionText	OptionStatus
Paris	Correct
London	Incorrect
Berlin	Incorrect
Rome	Incorrect
Earth	Incorrect
Mars	Correct
Jupiter	Incorrect
Venus	Incorrect
Harper Lee	Correct
J.K. Rowling	Incorrect
Ernest Hemingway	Incorrect
Jane Austen	Incorrect
1	Incorrect
2	Correct
3	Incorrect

Key SQL Queries

7. Subquery: Write a query to find all users who have answered more than 20 questions. Use a subquery in the WHERE clause to find these UserIDs. (No. of Questions – 10)

```
SELECT UserID FROM UserAnswers
GROUP BY UserID HAVING
COUNT(QuestionID) > 5;
```

Result Grid

	UserID
▶	10

Key SQL Queries

8. Group By: Write a query to get the total number of questions for each quiz. Group the results by QuizID.

```
SELECT QuizID, COUNT(QuestionID) AS TotalQuestions FROM Questions GROUP BY QuizID;
```

	QuizID	TotalQuestions
▶	1	4
	2	4
	3	4
	4	4
	5	4
	6	4
	7	4
	8	4
	9	4
	10	4

Key SQL Queries

9. Having Clause: Write a query to get the total number of quizzes created by each user, but only include users who have created more than 3 quizzes. Use the HAVING clause.

```
SELECT u.UserID, u.Username, COUNT(q.QuizID) AS TotalQuizzes FROM Users u JOIN Quizzes q ON u.UserID = q.UserID GROUP BY u.UserID, u.Username HAVING COUNT(q.QuizID) > 3;
```

	UserID	Username	TotalQuizzes
▶	2	Bob	4

Key SQL Queries

10. Limit: Write a query to select the top 5 quizzes with the highest number of questions.

```
SELECT QuizID, COUNT(QuestionID) AS TotalQuestions FROM Questions GROUP BY QuizID ORDER BY TotalQuestions DESC LIMIT 5;
```

	QuizID	TotalQuestions
▶	1	4
	2	4
	3	4
	4	4
	5	4

Key SQL Queries

11. Inner Join: Write a query to join UserAnswers with Questions to get a list of all user answers including Username, QuestionText, and SelectedOptionID.

```
SELECT ua.UserID, q.QuestionText, ua.SelectedOptionID, u.Username FROM UserAnswers ua INNER JOIN Questions q ON ua.QuestionID = q.QuestionID INNER JOIN Users u ON ua.UserID = u.UserID;
```

UserID	QuestionText	SelectedOptionID	Username
1	What is the capital of France?	1	Alice
1	Which planet is known as the Red Planet?	6	Alice
1	Who wrote "To Kill a Mockingbird"?	9	Alice
1	What is the smallest prime number?	14	Alice
2	What is H2O?	17	Bob
2	What is the speed of light?	21	Bob
2	Who developed the theory of relativity?	25	Bob
2	What is the chemical symbol for gold?	29	Bob
3	Who was the first president of the United States?	33	Charlie
3	In what year did World War II end?	37	Charlie
4	What ancient civilization built the pyramids?	41	David
4	Who was the first emperor of China?	45	David
4	What is the value of Pi?	49	David

Result 22

Key SQL Queries

12. Outer Join: Write a query to get a list of all quizzes and any associated questions. Include quizzes that might not have any questions.

```
SELECT q.QuizID, q.QuizName,
COUNT(qs.QuestionID) AS
NumberOfQuestions FROM Quizzes q
LEFT JOIN Questions qs ON q.QuizID =
qs.QuizID GROUP BY q.QuizID,
q.QuizName;
```

QuizID	QuizName	NumberOfQuestions
1	General Knowledge Quiz	4
2	Science Quiz	4
3	History Quiz	4
4	Math Quiz	4
5	Literature Quiz	4
6	Geography Quiz	4
7	Music Quiz	4
8	Art Quiz	4
9	Sports Quiz	4
10	Technology Quiz	4

Key SQL Queries

13. Join with Aggregation: Write a query to get the total number of options for each question. Use an INNER JOIN between Questions and Options, and group by QuestionID.

```
SELECT q.QuestionID, COUNT(o.OptionID)
AS TotalOptions FROM Questions q
INNER JOIN Options o ON q.QuestionID =
o.QuestionID GROUP BY q.QuestionID;
```

QuestionID	TotalOptions
1	4
2	4
3	4
4	4
5	4
6	4
7	4
8	4
9	4
10	4
11	4
12	4
13	4

Key SQL Queries

14. Subquery with Join: Write a query to find all quizzes where the average score for all users is higher than 80. Use a subquery in the WHERE clause to find these QuizIDs.

```
SELECT q.QuizID, q.QuizName FROM Quizzes q WHERE ( SELECT AVG(s.Score) FROM Scores s WHERE s.QuizID = q.QuizID ) > 80;
```

QuizID	QuizName
1	General Knowledge Quiz
2	Science Quiz
7	Music Quiz
8	Art Quiz
9	Sports Quiz
10	Technology Quiz
NULL	NULL

Key SQL Queries

15. Advanced Join: Write a query to list Username, QuizName, and Score for all users who have completed a quiz. Use INNER JOIN and LEFT JOIN as necessary to get all required details.

```
SELECT u.Username, q.QuizName, s.Score FROM Users u INNER JOIN Scores s ON u.UserID = s.UserID LEFT JOIN Quizzes q ON s.QuizID = q.QuizID;
```

Username	QuizName	Score
Alice	General Knowledge Quiz	85.00
Bob	Science Quiz	85.42
Charlie	History Quiz	50.00
David	Math Quiz	75.00
Eve	Literature Quiz	75.50
Frank	Geography Quiz	80.00
Grace	Music Quiz	80.45
Hank	Art Quiz	85.12
Ivy	Sports Quiz	84.12
Jack	Technology Quiz	95.00

Insights

- **Popular quizzes**: Identified by the number of questions and user participation.
- **User performance**: Trends in scores and common mistakes.
- **Quiz effectiveness:** Based on average scores.


ONLINE TEST
ENTER
Thank you for your attention