

## **AIM / PROBLEM STATEMENT:**

Our goal is to create a student and administrator-friendly program that will allow students to attempt quizzes and administrators to create, edit, and display question banks. First, we have created interfaces for the Home Page, Registration Page, Login Page, Quiz, Add Question, Edit Question, Result Page, Student Profile, Admin Profile, and numerous other interfaces. All of these interfaces are connected to the database in order to function properly.

Quiz Management System, as described above, can lead to error free, secure, reliable and fast management systems. It can help the user focus on their other tasks rather than record keeping so that they can achieve their goals. The project essentially outlines how to manage for good performance and better services to the quiz participants. After the examination is complete, the system will display the results. The multiple choice questions that are uploaded into the system are examined and automatically graded by the system. The whole system is given administrative control.

## **LITERATURE SURVEY:**

At educational institutions, databases for quizzes and student records are frequently used to manage student data, quiz questions, and quiz outcomes. These databases often contain numerous tables connected by primary and foreign keys, such as student records, quiz questions, marks obtained, and results. The design and implementation of databases for quiz and student records have been studied in several research publications, which have addressed topics including data modelling, query optimisation, and security. The proposed system consists of an interface for administering online examinations, a database for storing examination data, and a set of modules for managing the examination process. The system allows the creation of multiple-choice questions. The system also includes features such as randomised question order, and immediate feedback to the student after the exam including an email sent to their respective emails.

Ray et al. (2016)'s work "Database design for an online examination system" proposes a database design for an online examination system. The authors detail the proposed system's architecture, design considerations, and database schema. The paper also goes into the system's implementation and testing. The authors use the entity-relationship (ER) model to design the database schema. They identify entities such as users, exams, questions, and answers and define their attributes and relationships. They also discuss the normalisation process to ensure the elimination of data redundancy and the maintenance of data consistency. Overall, the paper describes the database architecture and implementation of

an online examination system in detail. The proposed approach is scalable, efficient, and simple to implement. The authors also advocate more research into increasing system security and incorporating machine learning techniques for personalised assessment recommendations. Data modelling, database design, database programming, and database management are all fundamental ideas in database systems.

Data modelling and schema design are key components of DBMS table construction. Many research publications on data modelling approaches and schema design procedures to ensure efficient and successful database architectures have been published. In their book "Fundamentals of Database Systems," Elmasri and Navathe (2016), for example, explore numerous data modelling principles such as entity-relationship (ER) modelling and relational data model. They also offer suggestions for schema design, normalisation, and denormalization procedures, all of which are required for developing efficient and scalable database tables. An overview of databases and database systems is followed by a discussion of data modelling principles such as entity-relationship diagrams and the relational data model. The course then goes through relational algebra, relational calculus, and SQL (Structured Query Language). Advanced subjects covered include object-oriented databases, distributed databases, and data warehousing. It also covers contemporary database developments such as NoSQL databases, big data analytics, and cloud databases. Indexing and constraints are crucial DBMS features that protect data integrity and boost query speed. Several research publications have investigated the influence of various types of constraints, such as primary key, foreign key, unique, and check constraints, on table construction. Indexing techniques, such as B-trees, hash indexing, and bitmap indexing, have also been extensively researched in the literature for streamlining data retrieval procedures. For example, Ramakrishnan and Gehrke's (2003) textbook 'Database Management Systems', gives a thorough review of restrictions and indexing in DBMS. The authors explore numerous sorts of restrictions and their consequences for database architecture, as well as various indexing algorithms and their benefits and drawbacks. Overall, knowing limitations and indexing is essential for developing and improving efficient and accurate databases. Ramakrishnan and Gehrke's work is an excellent resource for anybody interested in learning more about these subjects.

Table generation is a key area where optimisation methods may be used to improve the speed of DBMS. Building tables may be a time-consuming and resource-intensive procedure, especially for large-scale databases, and streamlining this process can assist to reduce overhead and maintain maximum performance. Parallel processing is a method of breaking down a job into smaller sub-tasks that may be executed concurrently on several processors or threads. Parallel processing can considerably reduce the time necessary for table building by dividing the job over numerous processors. Another optimisation strategy is caching, which involves keeping frequently requested data in memory to decrease the number of disc

accesses necessary. This can assist to enhance table generation performance by reducing the amount of time necessary to access and retrieve data. Materialised views are pre-computed tables that store the results of a difficult query for subsequent query processing. The overhead of accessing the database may be decreased by building materialised views for frequently requested data, boosting overall efficiency. In addition to these approaches, other optimisation tactics, such as indexing and query optimisation, can be used to increase table speed. Database designers and administrators may use these optimisation approaches to guarantee that their DBMS can manage large-scale databases and conduct data storage and retrieval functions effectively.

While organisations such as Amazon, Google, LinkedIn, and Twitter battled to deal with huge data amounts and operation volumes under strict latency limitations, NoSQL arose. Studying high-volume, real-time data, such as website click streams, gives considerable commercial advantage by leveraging unstructured and semi-structured data sources to increase corporate value. Traditional relational databases were inadequate for the task, so enterprises leveraged a decade of research on distributed hash tables (DHTs) and either traditional relational database systems or embedded key stores, such as Oracle's Berkeley DB, to create highly available, distributed key-value stores. NoSQL databases are built to be highly scalable and adaptable, making them excellent for handling massive amounts of unstructured or semi-structured data. They often employ a distributed design, which allows data to be dispersed over numerous nodes, making massive amounts of data easier to handle while also ensuring high availability and fault tolerance. NoSQL databases are frequently used for real-time data analysis, such as monitoring website clickstreams or social media data, to give important insights into customer behaviour and preferences to organisations. Enterprises may exploit unstructured and semi-structured data sources to create greater business value and remain ahead of the competition by using the potential of NoSQL databases.

## CHALLENGES AND ISSUES:

Designing a quiz management system may be a difficult endeavour, with several obstacles and concerns that developers may encounter. Here are some of the most prevalent challenges we faced while developing our project:

- 1. Designing an appropriate data model:** The first challenge was to design a data model that accurately represents the relationships between the entities in the system. This required careful consideration of the entities, their attributes, and the relationships between them. Next, the relationships between the entities had to be defined, such as a student taking one or more quizzes, a quiz having multiple questions, and a question having multiple answers. Attributes were then defined for each entity, such as name, email, and ID for the student entity, and title, and description for the quiz entity. Data

types should be assigned to each attribute, such as integer for student ID. Normalisation was also performed to eliminate redundancies and ensure data consistency. Finally, performance optimisation strategies such as index creation and data splitting were examined to guarantee that the system works efficiently.

If we have a course with two entities and a student, student grades may be regarded as a descriptive entity. A descriptive entity is one that describes another entity or gives further information about it. In this scenario, the student entity's grades give extra information. For example, if a student enrolls in a course, their course grades convey descriptive information about how well they performed in that course. As a result, the student's grades may be thought of as a descriptive entity in connection to the course and student entities. A weak entity is one that cannot be identified on its own and must rely on another entity (known as a strong entity) for meaning. "Marks" cannot exist in this system without a reference to both the "course" and "student" entities, which are the strong entities. Hence creating a weak entity for "marks" in order to more effectively describe the links and dependencies between the three entities in the data model was a better approach. This can also help manage and retrieve information more effectively while working with course, student, and grade data.

2. **Ensuring data consistency and integrity:** In order to maintain the accuracy of the data across the system, a quiz management system must provide data consistency and integrity. This was accomplished through the use of constraints and validation rules. Constraints assist guarantee that the data complies to the data model's standards, while validation rules help verify that the data entered is legitimate. A validation rule, for example, was used to verify that only numeric data is input in fields that need a number. Constraints and validation rules assist to verify that data entered into the system is reliable and consistent, which is necessary for producing accurate results and reports. Another approach to ensuring data consistency and integrity in a quiz management system is by implementing referential integrity. Referential integrity ensures that the relationships between tables in the database are maintained, and any changes made to one table are reflected in the related tables. This was accomplished with the help of foreign key constraints, which link entries in one table to records in another. To guarantee that only valid student IDs are inserted into the results database, a foreign key constraint was implemented between the results table and the student table. This contributed to data consistency and integrity by preventing inaccurate or wrong data from being entered into the system. Finally, access controls and authentication techniques such as user roles, permissions, and password policies can be set to guarantee system security and prevent unauthorised access or alterations. These safeguards serve to guarantee that only authorised users may access and edit data in the system, improving data consistency and integrity even further.
3. **Redundancy:** Redundancy is a common issue that can arise in database management when data is stored in multiple tables, leading to duplicated data and inefficiencies in data retrieval and management. For example, storing the same student's contact details (e.g., email, phone number) in multiple tables, such as a "studentinfo" table and

a "marks" table, can result in redundant data and potential inconsistencies. We attempted to reduce repetition by creating a separate database for holding student contact information, with a unique student ID serving as the primary key. This enables a one-to-one link between the "students" table and the "contact\_no" database, with each student having a single entry in the contact information table. This method guarantees that data is kept efficiently and lowers the chance of data management inconsistencies or mistakes. It is also critical to establish appropriate relationships across tables in order to minimise repetition. For example, if a student can take many quizzes, a separate "marks" database with a foreign key referencing the student ID in the "students" table may be acceptable. This allows for a one-to-many link between the "students" and "marks" tables, in which one student may be connected with many quiz scores without repeating the student's contact information in the "marks" table.

By implementing these strategies, we tried to reduce data redundancy, improve data retrieval and management efficiency, and ensure data consistency and accuracy.

4. **Inappropriate Data Types:** Using inappropriate data types for database columns can result in inefficient storage and decreased performance. For instance, using the VARCHAR data type for storing large text fields, such as quiz questions or answers, can lead to wasted storage space and poor query performance. This is because the VARCHAR data type allocates a fixed amount of storage space for each column, regardless of the actual size of the text data. To prevent these problems, selecting appropriate data types for columns based on the amount and nature of the data that is being saved. We utilised data types such as TEXT for huge text fields since they are built to hold large volumes of text data effectively. These data types dynamically allot store space based on the size of the text data, optimising storage space and query speed. We assure optimal storage and query efficiency, increase data integrity and consistency, and limit the risk of data loss or corruption by selecting appropriate data types for columns. It is also critical to check the data types used in the database on a regular basis to ensure that they stay acceptable when data and usage patterns change over time.
5. **Lack of Normalisation:** Lack of normalisation in a database can lead to redundancy and data anomalies, making it challenging to manage and retrieve data efficiently. This issue can arise when all the student information, such as name, contact details, and quiz scores, is stored in a single table without proper normalisation. This approach results in redundant data, where the same information is repeated across multiple rows, and data anomalies, where inconsistencies or errors can occur due to data duplication. To address this problem, we considered normalising the database by dividing the student information into smaller, more manageable tables. To avoid redundancy and minimise errors in the data, student information should be segregated into tables such as "students," "marks," and "contact\_no," with appropriate relationships (e.g., one-to-many, many-to-many) between them. This method assures that each table holds just one type of data, eliminating data duplication and the danger of data inconsistency. It also makes data management and retrieval more efficient, enhancing system performance overall.

### **quiz Database:**

We created a database that stores questions for quizzes. Initially, included a single table called "admin" with the following columns:

username(Primary Key)  
password  
email\_id1  
email\_id2  
contact\_no1  
contact\_no2  
first\_name  
last\_name

However, this table may suffer from redundancy and anomalies. By applying normalisation, we can create separate tables for students, courses, and enrollments, as follows:

#### **Table 1: "courses"**

Columns: cid (Primary Key), cname, credit

#### **Table 2: "que\_bank"**

Columns: qid(Primary Key), cid(Foreign Key referencing courses.cid), admin(Foreign Key referencing admin.username), ques, answer, opt1, opt2, opt3

#### **Table 3: "studentinfo"**

Columns: rollno(Primary Key), password, first\_name, last\_name, dob, email\_id, contact\_no

#### **Table 4: "enrolled"**

Columns: rollno(Primary Key), rollno(Foreign Key referencing studentinfo.rollno), cid (Foreign Key referencing courses.cid), enr\_state

#### **Table 5: "marks"**

Columns: rollno(Primary Key), rollno(Foreign Key referencing studentinfo.rollno), cid (Foreign Key referencing courses.cid), date, marks

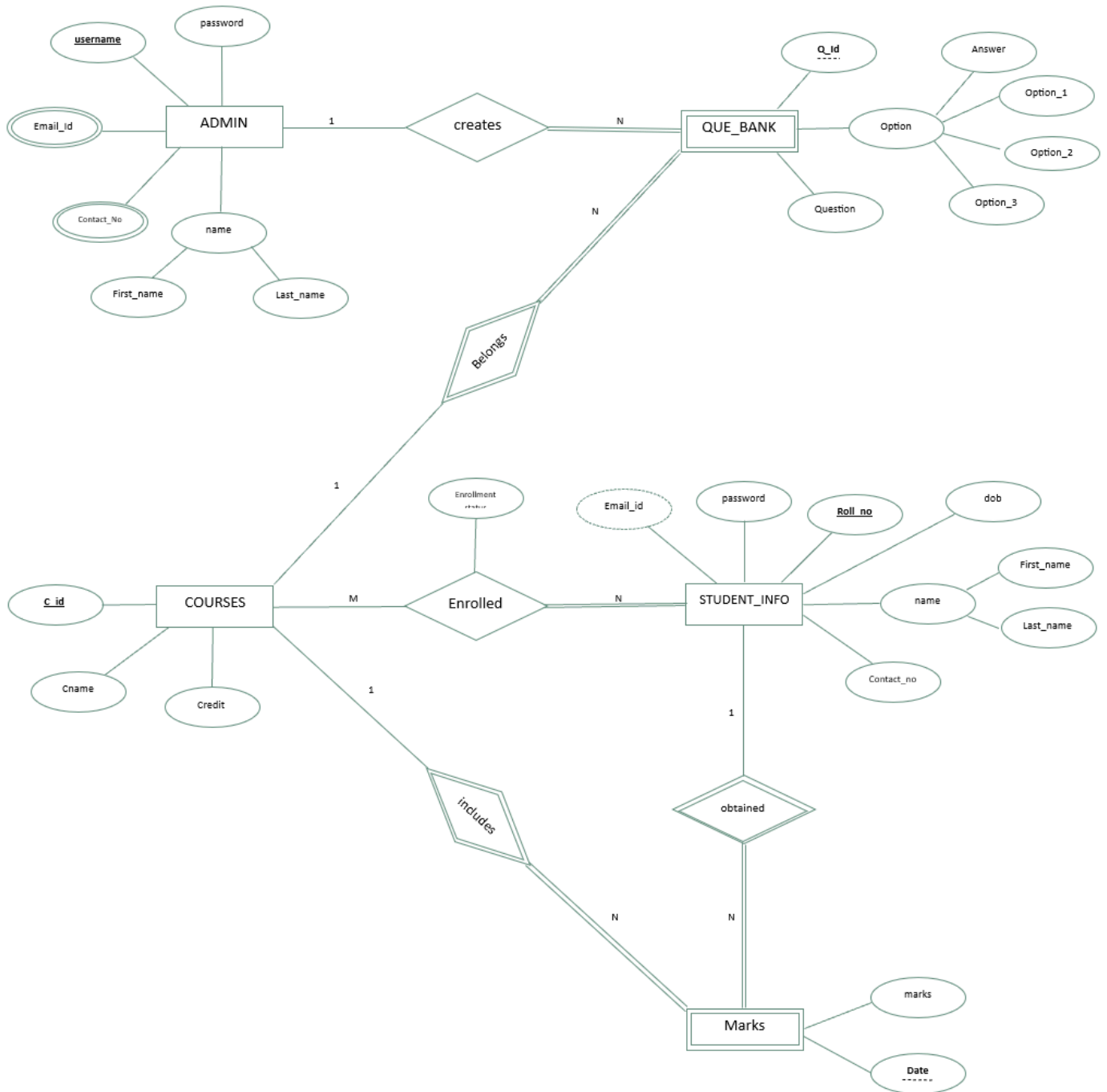
Hence by applying normalisation, we tried to eliminate redundancy, ensure data integrity, and improve the overall design of the database. In summary, normalising the database is an important step in reducing duplication and data anomalies that might occur when all student information is contained in a single table. Educational institutions can improve the performance, reliability, and maintainability of their databases by splitting the data into smaller, more manageable tables and establishing suitable linkages between them.

- 6. Managing concurrent access:** Managing concurrent access requires careful consideration and planning to ensure that conflicts are handled appropriately and that

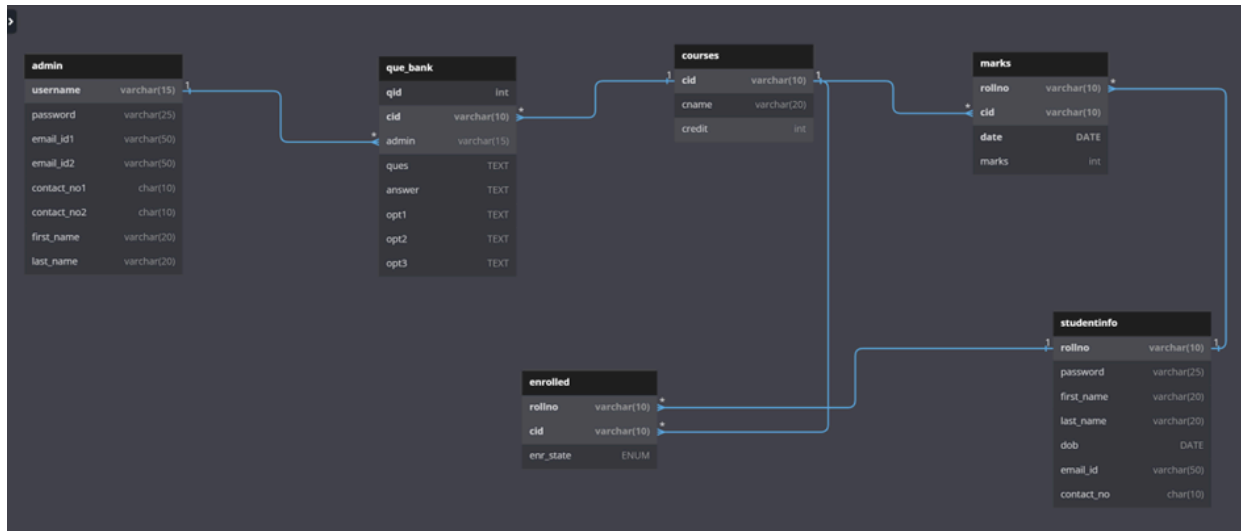
data consistency is maintained. It is essential to select the appropriate solution based on the system's unique requirements and restrictions, as well as the potential trade-offs between locking and concurrency management in terms of performance, scalability, and complexity.

- 7. Designing the User Interface:** Developing a user-friendly interface that is simple to navigate and intuitive was challenging. The user interface had to be pleasant visually, responsive, and accessible to all users. The UI is basic and straightforward, with a simple and clear layout free of clutter and excessive complexity. To make the interface more predictable and familiar for users, a consistent design should be applied across the whole system, including fonts, colours, and layouts. Complex terminology should be avoided, and clear and straightforward language should be utilised. To help visitors through the questionnaire, visual cues such as icons, buttons, and colours should be employed.
- 8. Security Risks:** Storing sensitive student data in the database, such as passwords or personal information, without sufficient encryption or access restrictions might expose educational institutions to substantial security concerns. In such circumstances, unauthorised parties may acquire access to the data, jeopardising the students' privacy and security. Such data breaches can have serious implications, including financial losses, legal responsibilities, reputational harm, and a loss of confidence among students and stakeholders. We developed strong security measures to secure the questionnaire and student data from unauthorised access and any data breaches in order to minimise these risks. This includes sensitive data encryption, robust authentication and authorisation procedures, and frequent security audits to uncover and resolve system flaws. Furthermore, it is critical to ensure that all staff members and stakeholders are aware of the dangers and have the required training and tools to keep the system secure. Implementing these security measures reduces the chance of security breaches, protecting the privacy and security of students' data.

# METHODOLOGY / COMPLEX QUERIES / DBMS CONCEPTS & EXPERIMENTAL SETUP







```

table admin {
    username varchar(15) [PRIMARY KEY]
    password varchar(25)
    email_id1 varchar(50)
    email_id2 varchar(50)
    contact_no1 char(10)
    contact_no2 char(10)
    first_name varchar(20)
    last_name varchar(20)
}

table courses{
    cid varchar(10) [PRIMARY KEY]
    cname varchar(20)
    credit int
}

table que_bank{
    qid int [PRIMARY KEY]
    cid varchar(10) [PRIMARY KEY]
    admin varchar(15)
    ques TEXT
    answer TEXT

```

```

    opt1 TEXT
    opt2 TEXT
    opt3 TEXT
}

table studentinfo {
    rollno varchar(10) [PRIMARY KEY]
    password varchar(25)
    first_name varchar(20)
    last_name varchar(20)
    dob DATE
    email_id varchar(50) [note: 'concat(rollno,\"@nirmauni.ac.in\")']
    contact_no char(10)
}

table enrolled {
    rollno varchar(10) [PRIMARY KEY]
    cid varchar(10) [PRIMARY KEY]
    enr_state ENUM('Enrolled','Dropped','Completed')
}

table marks{
    rollno varchar(10) [PRIMARY KEY]
    cid varchar(10) [PRIMARY KEY]
    date DATE [PRIMARY KEY]
    marks int
}

Ref: admin.username < que_bank.admin
Ref: courses.cid < que_bank.cid
Ref: studentinfo.rollno < enrolled.rollno
Ref: courses.cid < enrolled.cid
Ref: studentinfo.rollno < marks.rollno
Ref: courses.cid < marks.cid

```

## QUERIES:

create database quiz;

use quiz;

```
create table admin (
    username varchar(15) PRIMARY KEY check (username like 'ADMIN%'),
    password varchar(25) NOT NULL check (char_length(password)>7),
    email_id1 varchar(50) NOT NULL check (email_id1 like '%@nirmauni.ac.in'),
    email_id2 varchar(50) DEFAULT NULL,
    contact_no1 char(10) NOT NULL,
    contact_no2 char(10) DEFAULT NULL,
    first_name varchar(20) NOT NULL,
    last_name varchar(20) NOT NULL
);
```

```
mysql> create table admin (
-> username varchar(15) PRIMARY KEY check (username like 'ADMIN%'),
-> password varchar(25) NOT NULL check (char_length(password)>7),
-> email_id1 varchar(50) NOT NULL check (email_id1 like '%@nirmauni.ac.in'),
-> email_id2 varchar(50) DEFAULT NULL,
-> contact_no1 char(10) NOT NULL,
-> contact_no2 char(10) DEFAULT NULL,
-> first_name varchar(20) NOT NULL,
-> last_name varchar(20) NOT NULL);
Query OK, 0 rows affected (0.09 sec)
```

```
create table courses(
    cid varchar(10) PRIMARY KEY check (cid like '2CS%'),
    cname varchar(20) NOT NULL,
    credit int NOT NULL check (credit in (1,2,3,4))
);
```

```
mysql> create table courses(
-> cid varchar(10) PRIMARY KEY check (cid like '2CS%'),
-> cname varchar(20) NOT NULL,
-> credit int NOT NULL check (credit in (1,2,3,4)));
Query OK, 0 rows affected (0.01 sec)
```

```
create table que_bank(
    qid int,
    cid varchar(10) REFERENCES courses(cid),
    admin varchar(15) REFERENCES admin(username),
```

```

    ques TEXT NOT NULL,
    answer TEXT NOT NULL,
    opt1 TEXT NOT NULL,
    opt2 TEXT NOT NULL,
    opt3 TEXT NOT NULL,
    CONSTRAINT pk_que_bank PRIMARY KEY (qid,cid)
);

```

```

mysql> create table que_bank(
    -> qid int,
    -> cid varchar(10) REFERENCES courses(cid),
    -> admin varchar(15) REFERENCES admin(username),
    -> ques TEXT NOT NULL,
    -> answer TEXT NOT NULL,
    -> opt1 TEXT NOT NULL,
    -> opt2 TEXT NOT NULL,
    -> opt3 TEXT NOT NULL,
    -> CONSTRAINT pk_que_bank PRIMARY KEY (qid,cid));
Query OK, 0 rows affected (0.02 sec)

```

```

alter table que_bank
    add CONSTRAINT fk_que_bank1 FOREIGN KEY (admin) REFERENCES admin(username);
alter table que_bank
    add CONSTRAINT fk_que_bank2 FOREIGN KEY (cid) REFERENCES courses(cid);

```

```

mysql> alter table que_bank
    -> add CONSTRAINT fk_que_bank1 FOREIGN KEY (admin) REFERENCES admin(username);
Query OK, 0 rows affected (0.07 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> alter table que_bank
    -> add CONSTRAINT fk_que_bank2 FOREIGN KEY (cid) REFERENCES courses(cid);
Query OK, 0 rows affected (0.05 sec)
Records: 0 Duplicates: 0 Warnings: 0

```

```

create table studentinfo (
    rollno varchar(10) PRIMARY KEY check (rollno like '%BCE%'),
    password varchar(25) NOT NULL check (char_length(password)>7),
    first_name varchar(20) NOT NULL,
    last_name varchar(20) NOT NULL,
    dob DATE NOT NULL,
    email_id varchar(50) as (concat(rollno,'@nirmauni.ac.in')),
    contact_no char(10) NOT NULL
);

```

```
mysql> create table studentinfo (
  -> rollno varchar(10) PRIMARY KEY check (rollno like '%BCE%'),
  -> password varchar(25) NOT NULL check (char_length(password)>7),
  -> first_name varchar(20) NOT NULL,
  -> last_name varchar(20) NOT NULL,
  -> dob DATE NOT NULL,
  -> email_id varchar(50) as (concat(rollno,'@nirmauni.ac.in')),
  -> contact_no char(10) NOT NULL);
Query OK, 0 rows affected (0.02 sec)
```

```
create table enrolled (
  rollno varchar(10) REFERENCES studentinfo(rollno),
  cid varchar(10) REFERENCES courses(cid),
  enr_state ENUM('Enrolled','Dropped','Completed'),
  CONSTRAINT pk_enrolled PRIMARY KEY (rollno,cid)
);
```

```
mysql> create table enrolled (
  -> rollno varchar(10) REFERENCES studentinfo(rollno),
  -> cid varchar(10) REFERENCES courses(cid),
  -> enr_state ENUM('Enrolled','Dropped','Completed'),
  -> CONSTRAINT pk_enrolled PRIMARY KEY (rollno,cid));
Query OK, 0 rows affected (0.01 sec)
```

```
alter table enrolled
  add CONSTRAINT fk_enrolled1 FOREIGN KEY(rollno) REFERENCES studentinfo(rollno);
```

```
alter table enrolled
  add CONSTRAINT fk_enrolled2 FOREIGN KEY(cid) REFERENCES courses(cid);
```

```
mysql> alter table enrolled
  -> add CONSTRAINT fk_enrolled1 FOREIGN KEY(rollno) REFERENCES studentinfo(rollno);
Query OK, 1 row affected (0.10 sec)
Records: 1 Duplicates: 0 Warnings: 0

mysql> alter table enrolled
  -> add CONSTRAINT fk_enrolled2 FOREIGN KEY(cid) REFERENCES courses(cid);
Query OK, 1 row affected (0.04 sec)
Records: 1 Duplicates: 0 Warnings: 0
```

```
create table marks (
  rollno varchar(10) REFERENCES studentinfo(rollno),
  cid varchar(10) REFERENCES courses(cid),
```

```

date DATE NOT NULL,
marks int NOT NULL check(marks>=0),
CONSTRAINT pk_marks PRIMARY KEY(rollno,cid,date)
);

```

```

mysql> create table marks (
  -> rollno varchar(10) REFERENCES studentinfo(rollno),
  -> cid varchar(10) REFERENCES courses(cid),
  -> date DATE NOT NULL,
  -> marks int NOT NULL check(marks>=0),
  -> CONSTRAINT pk_marks PRIMARY KEY(rollno,cid,date));
Query OK, 0 rows affected (0.01 sec)

```

```

alter table marks
  add CONSTRAINT fk_marks1 FOREIGN KEY (rollno) REFERENCES studentinfo(rollno);

```

```

mysql> alter table marks
  -> add CONSTRAINT fk_marks1 FOREIGN KEY (rollno) REFERENCES studentinfo(rollno);
Query OK, 1 row affected (0.16 sec)
Records: 1  Duplicates: 0  Warnings: 0

```

```

alter table marks
  add CONSTRAINT fk_marks2 FOREIGN KEY (cid) REFERENCES courses(cid);

```

```

mysql> alter table marks
  -> add CONSTRAINT fk_marks2 FOREIGN KEY (cid) REFERENCES courses(cid);
Query OK, 1 row affected (0.04 sec)
Records: 1  Duplicates: 0  Warnings: 0

```

#### Admin:

insert into admin

```

values('ADMIN1','12345678','admin1@nirmauni.ac.in',NULL,'1234567890',NULL,'f_admin','l_admin');

```

insert into admin

```

values('ADMIN2','11223344','admin2@nirmauni.ac.in',NULL,'0987654321',NULL,'f_admin2','l_admin2');

```

insert into admin

```

values('ADMIN3','12345678','admin3@nirmauni.ac.in',abc@abc.com,'1234567890',1212121212,'f_admin2','l_admin2');

```

```
mysql> select * from admin;
```

username	password	email_id1	email_id2	contact_no1	contact_no2	first_name	last_name
ADMIN1	12345678	admin1@nirmauni.ac.in	NULL	1234567890	NULL	f_admin	l_admin
ADMIN2	11223344	admin2@nirmauni.ac.in	NULL	0987654321	NULL	f_admin2	l_admin2
ADMIN3	12345678	admin3@nirmauni.ac.in	abc@abc.com	1234567890	1212121212	f_admin	l_admin

```
3 rows in set (0.00 sec)
```

```
insert into courses values ('2CS301','DSA',4);
insert into courses values ('2CS302','OOP',4);
insert into courses values ('2CS303','DE',3);
insert into courses values ('2CS304','DC',3);
insert into courses values ('2CS305','DM',2);
insert into courses values ('2CS306','POE',2);
```

```
mysql> insert into courses values ('2CS301','DSA',4);
Query OK, 1 row affected (0.01 sec)

mysql> insert into courses values ('2CS302','OOP',4);
Query OK, 1 row affected (0.01 sec)

mysql> insert into courses values ('2CS303','DE',3);
Query OK, 1 row affected (0.01 sec)

mysql> insert into courses values ('2CS304','DC',3);
Query OK, 1 row affected (0.01 sec)

mysql> insert into courses values ('2CS305','DM',2);
Query OK, 1 row affected (0.01 sec)

mysql> insert into courses values ('2CS306','POE',2);
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from COURSES;
```

cid	cname	credit
2CS301	DSA	4
2CS302	OOP	4
2CS303	DE	3
2CS304	DC	3
2CS305	DM	2
2CS306	POE	2

```
6 rows in set (0.00 sec)
```

**ADDQ**

```
select qid from que_bank where cid=' ';
insert into que_bank values(...);
```

**ADMIN1**

```
SELECT * FROM admin;
```

**ADMIN\_PROFILE**

```
select * from admin where username=' ' ;
```

**EDITQ**

```
select * from que_bank where cid=' ' and qid = ' ' ;
update que_bank set ques = ' ',answer= ' ',opt1= ' ',opt2= ' ',opt3= ' ' where cid=' ' and qid = ' ' ;
delete from que_bank where cid= ' ' and qid= ' ' ;
```

**GRADE**

```
select cid,marks,date from marks where rollno = ' ' ;
```

**QUIZ**

```
select * from que_bank where cid= ' ' order by RAND();
insert into marks values (...);
select email_id from studentinfo where rollno= ' ' ;
```

**Que\_bank**

```
select qid,admin,ques,answer,opt1,opt2,opt3 from que_bank where cid= ' ' ;
```

**SIGN UP**

```
insert into studentinfo(rollno ,password,first_name,last_name,dob,contact_no ) values(...);
insert into enrolled values (...);
```

**STUDENT RECORD**

```
select * from marks where marks IS NOT NULL and cid=' ' ;
select avg(marks) from marks group by cid having cid=' ' ;
```

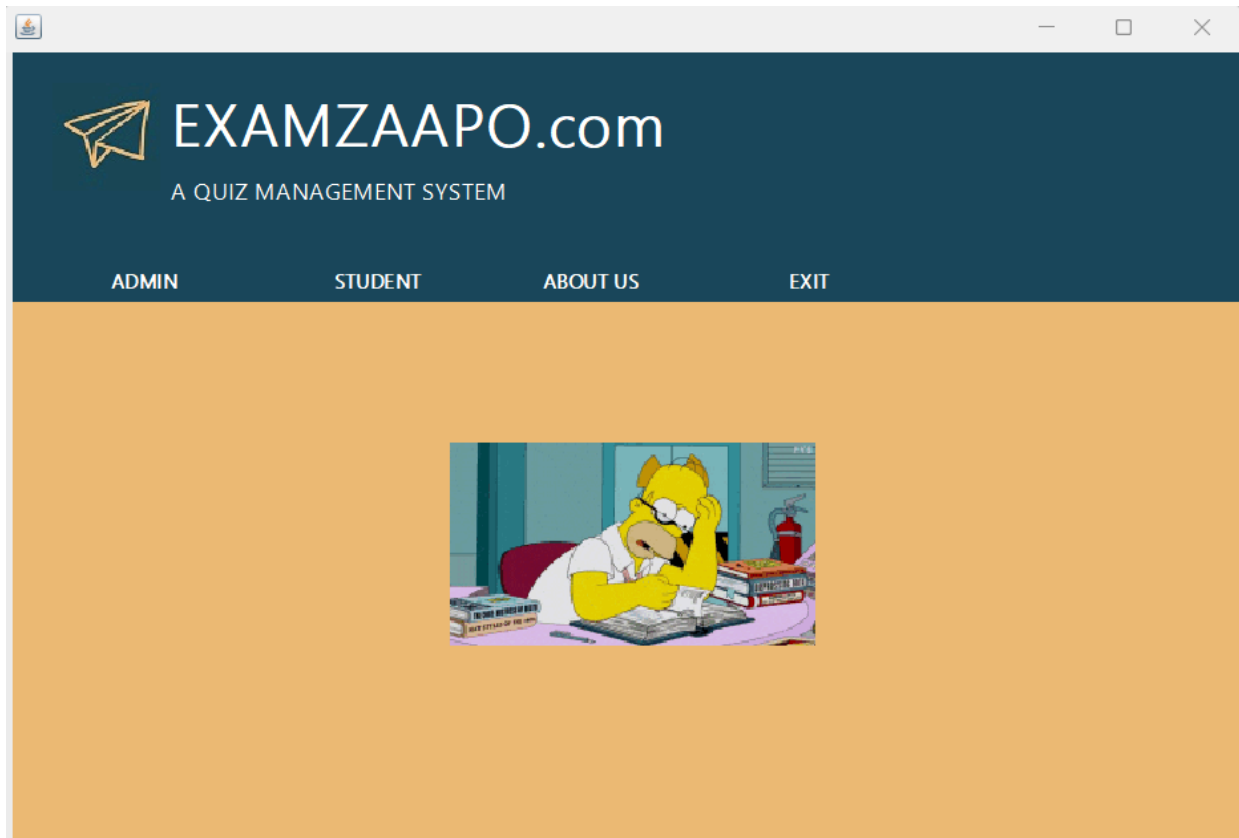
**STUDENT PROFILE**

```
select * from studentinfo where rollno= ' ' ;
select cname from courses INNER JOIN enrolled ON courses.cid=enrolled.cid where rollno=' ' ;
```

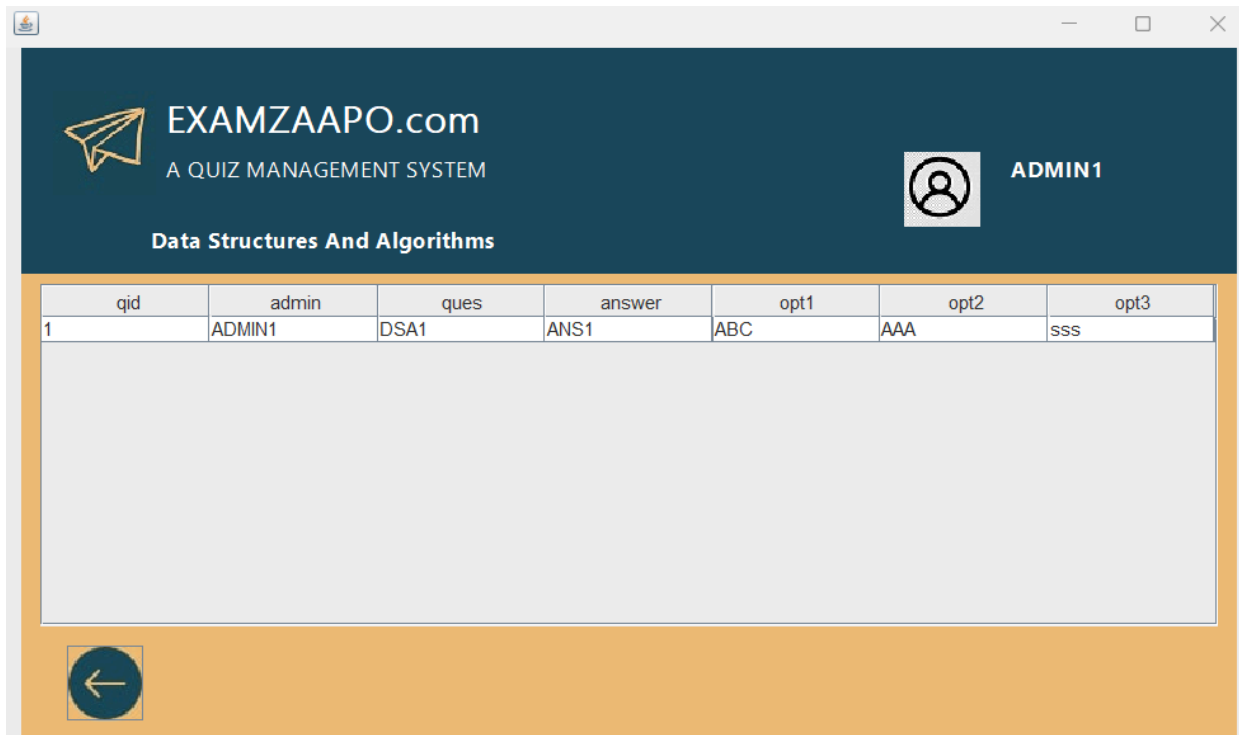
**STUDENT LOGIN**

```
SELECT * FROM studentinfo;
```





```
mysql> select * from que_bank;
+-----+-----+-----+-----+-----+-----+-----+-----+
| qid | cid   | admin | ques | answer | opt1 | opt2 | opt3 |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 1   | 2CS301 | ADMIN1 | DSA1 | ANS1   | ABC  | AAA  | sss  |
+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)
```




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**ADMIN1**

**Data Structures And Algorithms**

qid	admin	ques	answer	opt1	opt2	opt3
1	ADMIN1	DSA1	ANS1	ABC	AAA	sss

←


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**ADMIN1**

### Data Structures And Algorithms

Question Id :

Question :


Answer :

Option 2 :

Option 3 :

Option 4 :

```
mysql> select * from que_bank;
+----+-----+-----+-----+-----+-----+-----+-----+
| qid | cid   | admin | ques | answer | opt1 | opt2 | opt3 |
+----+-----+-----+-----+-----+-----+-----+-----+
| 1   | 2CS301 | ADMIN1 | DSA1 | answer | ABC  | hhh  | www  |
+----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)
```



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**STUDENT-SIGNUP**

FIRST-NAME :

LAST-NAME :

ROLL NO. :

CONTACT NO :


DOB:  

PASSWORD :

COURSES :

☒ DSA  
☒ DE  
☐ DM

☒ OOP  
☒ DC  
☐ POE



```
mysql> select * from STUDENTINFO;
```

rollno	password	first_name	last_name	dob	email_id	contact_no
21BCE269	12345678	BHAVYA	SHAH	2004-04-22	21BCE269@nirmauni.ac.in	1234567890

1 row in set (0.00 sec)

```
mysql> select * from ENROLLED;
```

rollno	cid	enr_state
21BCE269	2CS301	Enrolled
21BCE269	2CS302	Enrolled
21BCE269	2CS303	Enrolled
21BCE269	2CS304	Enrolled

```
4 rows in set (0.00 sec)
```

## **CONCLUSION:**

In conclusion, designing an experimental setup for a database that can store quiz and student record data requires a thorough understanding of normalization principles. Normalization is the process of organizing data in a database to eliminate redundancy and improve data integrity.

In this experimental setup, the database was designed to include tables for quizzes, students, and grades. The tables were then normalized to ensure that data was stored efficiently and accurately. First normal form (1NF) was achieved by ensuring that each table had a primary key, and that each attribute had atomic values. Second normal form (2NF) was achieved by removing any partial dependencies from the tables, while third normal form (3NF) was achieved by removing any transitive dependencies.

By following these normalization principles, the experimental database setup was able to store quiz and student record data in a structured, organized, and efficient manner. This will make it easier to retrieve and analyze data in the future, ultimately leading to better decision making and improved outcomes.

**REFERENCES:**

Garcia-Molina, H., Ullman, J. D., & Widom, J. (2008). Database Systems: The Complete Book. Prentice Hall.

Ray, S., Chakraborty, S., Chakraborty, S., & Saha, S. (2016). Database design for an online examination system. International Journal of Engineering and Technology, 8(4), 1969-1974.

Elmasri, R., & Navathe, S. B. (2016). Fundamentals of Database Systems (7th ed.). Pearson.

Ramakrishnan, R., & Gehrke, J. (2003). Database Management Systems. McGraw-Hill.

Hellerstein, J. M., Stonebraker, M., & Hamilton, J. (2011). Readings in Database Systems (4th ed.). MIT Press.

