Mobile Apps 2

Assignment Three

Submission Date 25/10/2024

Percent 10%

Include all workings and references

Section A.

"*The form of database selected by an organization depends on the complexity of the data it uses and how necessary it is needed on a real-time basis"*

1. Discuss, giving examples of where a particular database deployment would be suitable (*3 marks*):

The choice of a database type largely hinges on the type of data being handled and the specific requirements of an organization. Here are some examples of different database deployments and where they shine:

1. Relational Databases (RDBMS)

   Examples: MySQL, PostgreSQL

   When to Use: Relational databases are particularly well-suited for applications that require complex queries and transactions. For instance, consider a banking application. It relies on an RDBMS to maintain a well-structured dataset of customer accounts, transactions, and balances. The ACID (Atomicity, Consistency, Isolation, Durability) properties are crucial here, as they ensure that the database maintains integrity even when multiple transactions occur at the same time. This means that a bank can confidently manage deposits, withdrawals, and transfers without risking errors or inconsistencies.

2. NoSQL Databases

   Examples: MongoDB, Cassandra

   When to Use: NoSQL databases are perfect for applications that deal with large volumes of unstructured or semi-structured data. Think about social media platforms like Facebook or Twitter. These platforms generate an immense amount of user-generated content and real-time interactions. NoSQL databases allow

these companies to manage such diverse data types flexibly. With their adaptable schemas, these databases can easily accommodate new types of data as they emerge, making them highly scalable and suitable for rapid growth.

3. In-Memory Databases

Examples: Redis, Memcached

When to Use: In-memory databases are designed for scenarios where extremely fast data retrieval is essential. For instance, an online gaming platform could utilize an in-memory database to store user session data. This setup allows for real-time updates and interactions without any lag, providing a seamless gaming experience. By keeping data in RAM rather than traditional disk storage, these databases significantly reduce access times, which is critical in fast-paced environments.

In summary, the right database deployment can make all the difference in how effectively an organization manages its data, ensuring that it meets its operational needs while providing a positive user experience.

2. Why have NoSQL databases become more popular in recent years? (*2 marks*):

NoSQL databases have gained popularity in recent years for several reasons:

Scalability: NoSQL databases are designed to scale out horizontally, allowing organizations to add more servers easily to accommodate increased data loads. This is particularly beneficial for applications experiencing rapid growth, such as e-commerce sites and social media platforms.

Flexibility and Speed: NoSQL databases support a variety of data models (document, key-value, graph, etc.), which enables developers to work with unstructured or semi-structured data without the need for a fixed schema. This flexibility allows for quicker development cycles and faster time-to-market for applications, as developers can iterate more rapidly without needing to modify the underlying database schema.

These factors, combined with the increasing complexity and diversity of data in modern applications, have contributed to the rise in the adoption of NoSQL databases.

Section B.

Using the Room database, set up the backend for the following database. The frontend component will be done next week.

You are creating an app that stores a job organizer of upcoming work for a decorator.

The job details will include the date to and from, name of customer, location and type of job (painting, wallpapering or both). (*5 marks*)

References

1. **Accessing data using Room DAOs**
2. **SQL vs NoSQL: 5 Critical Differences**
3. **What are Various Types of Databases?**
4. **Full Room Database Tutorial - Build Notes App with Room DB**
5. **Room Database in Android | Android Tutorial | 2024**
6. **Save data in a local database using Room**
7. **https://developer.android.com/jetpack/androidx/releases/room**

GitHub Project Repository

- **Room Database**