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EXPERIMENT NO. 09

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Roll no.: 15,27,28 [A]

Group no. : 04

Date : 04-DECEMBER-2022.

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AIM : To study any one NoSQL database and develop an application that incorporates NoSQL database access.

PROBLEM STATEMENT:

Each group will identify and propose an application that will incorporate a NoSQL database(s). Additionally, the group members are free to use and integrate available software applications and state-of-art technologies they are good at.

INTRODUCTION :

NoSQL originally referring to non SQL or non relational is a database that provides a mechanism for storage and retrieval of data. NoSQL databases are used in real-time web applications and big data and their use are increasing over time. NoSQL systems are also sometimes called Not only SQL to emphasize the fact that they may support SQL-like query languages.

A NoSQL database includes simplicity of design, simpler horizontal scaling to clusters of machines and finer control over availability. The data structures used by NoSQL databases are different from those used by default in relational databases which makes some operations faster in NoSQL. Data structures used by NoSQL databases are sometimes also viewed as more flexible than relational database tables

Most NoSQL stores lack true **ACID**(Atomicity, Consistency, Isolation, Durability) transactio . Most NoSQL databases offer a concept of eventual consistency in which database changes are propagated to all nodes so queries for data might not return updated data immediately or might result in reading data that is not accurate which is a problem known as stale reads.

ADVANTAGES OF NOSQL DATABASES INCLUDE:

❖ Flexible Data Model:

NoSQL databases are highly flexible as they can store and combine any type of data, both structured and unstructured, unlike relational databases that can store data in a structured way only.

❖ Evolving Data Model :

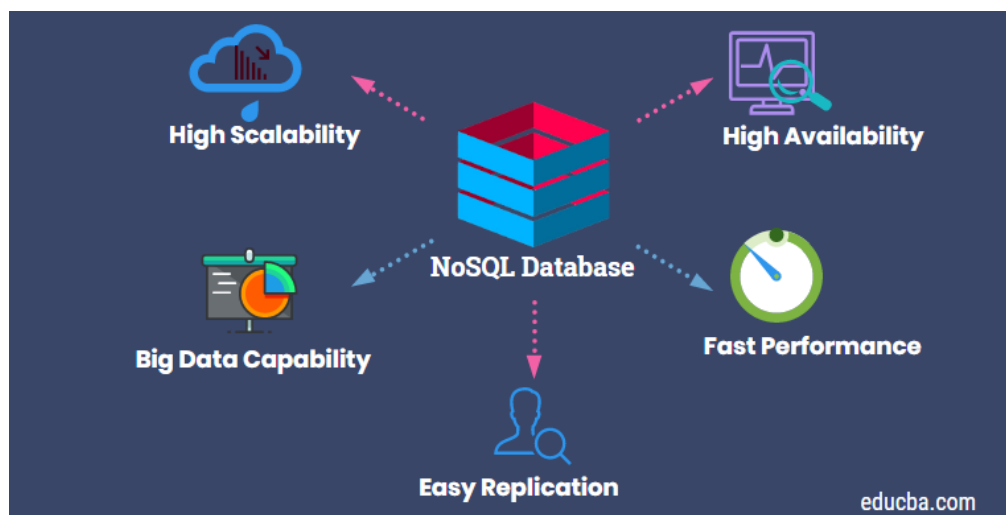
NoSQL databases allow you to dynamically update the schema to evolve with changing requirements while ensuring that it would cause no interruption or downtime to your application.

❖ High Performance:

NoSQL databases are built for great performance, measured in terms of both throughput (it is a measure of overall performance) and latency.

❖ Open-source:

NoSQL databases don't require expensive licensing fees and can run on inexpensive hardware, rendering their deployment cost-effective.



ADVANTAGES OF NOSQL DATABASES

TYPES OF NOSQL DATABASES:

❖ Document-Based Database:

The document-based database is a nonrelational database. Instead of storing the data in rows and columns (tables), it uses the documents to store the data in the database. A document database stores data in JSON, BSON, or XML documents.

EXAMPLE : MongoDB

❖ Key-Value Stores:

A key-value store is a nonrelational database. The simplest form of a NoSQL database is a key-value store. Every data element in the database is stored in key-value pairs.

EXAMPLE : Redis

❖ Column Oriented Databases:

A column-oriented database is a non-relational database that stores the data in columns instead of rows. That means when we want to run analytics on a small number of columns, you can read those columns directly without consuming memory with the unwanted data.

EXAMPLE : Cassandra

❖ Graph-Based databases:

Graph-based databases focus on the relationship between the elements. It stores the data in the form of nodes in the database. The connections between the nodes are called links or relationships.

EXAMPLE : Neo4j



Key Value



Document Db



Wide Column



Graph DB

TYPES OF NOSQL DATABASE

IN THIS EXPERIMENT WE WOULD BE USING MONGODB WHICH HAS A DOCUMENT-BASED STRUCTURE.

MongoDB is an open-source document-oriented database that is designed to store a large scale of data and also allows you to work with that data very efficiently. It is categorized under the NoSQL (Not only SQL) database because the storage and retrieval of data in the MongoDB are not in the form of tables.

Now, we will see how actually thing happens behind the scene.

As we know that MongoDB is a database server and the data is stored in these databases. Or in other words, MongoDB environment gives you a server that you can start and then create multiple databases on it using MongoDB.

Because of its NoSQL database, the data is stored in the collections and documents. Hence the database, collection, and documents are related to each other as shown below:

- ❖ The MongoDB database contains collections just like the MYSQL database contains tables. You are allowed to create multiple databases and multiple collections.
- ❖ Now inside of the collection we have documents. These documents contain the data we want to store in the MongoDB database and a single collection can contain multiple documents and you are schema-less meaning it is not necessary that one document is similar to another.
- ❖ MongoDB stores data in flexible, JSON-like documents, meaning fields can vary from document to document and data structure can be changed over time
- ❖ The documents are created using the fields. Fields are key-value pairs in the documents, it is just like columns in the relation database. The value of the fields can be of any BSON data types like double, string, Boolean, etc.
- ❖ The document model maps to the objects in your application code, making data easy to work with

- ❖ The data stored in the MongoDB is in the format of BSON documents. Here, BSON stands for Binary representation of JSON documents. Or in other words, in the backend, the MongoDB server converts the JSON data into a binary form that is known as BSON and this BSON is stored and queried more efficiently.
- ❖ In MongoDB documents, you are allowed to store nested data. This nesting of data allows you to create complex relations between data and store them in the same document which makes the working and fetching of data extremely efficient as compared to SQL.
- ❖ MongoDB is a distributed database at its core, so high availability, horizontal scaling, and geographic distribution are built in and easy to use



CREATING WEBSITE

HOTEL MANAGEMENT SYSTEM

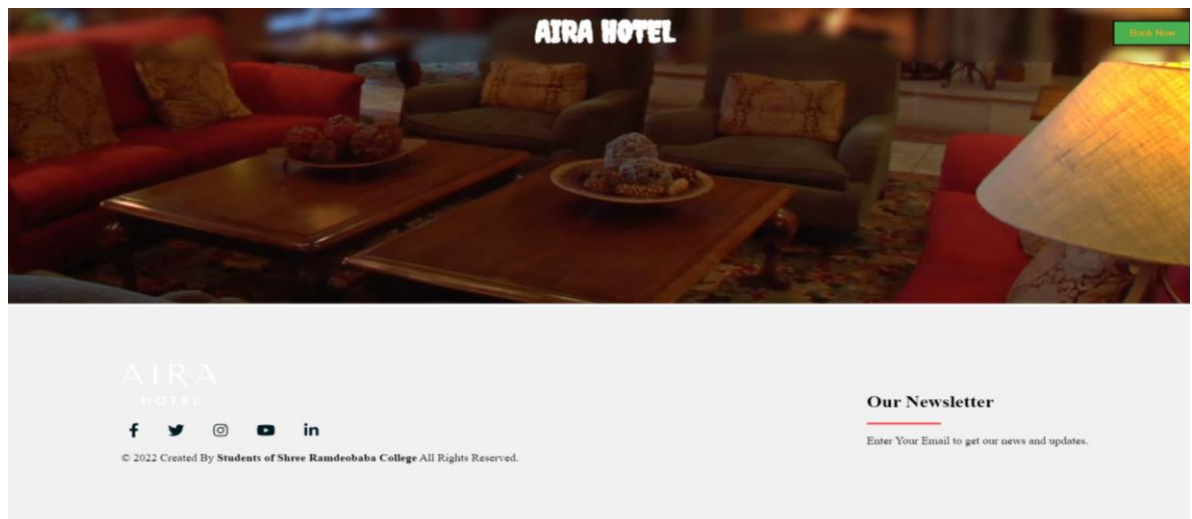
This website is intended for the owners of Hotel where they need to manage their employee and customer data, Many of the small or even large scale business always have an existing and long lasting problem managing their employee and customer data.

We used NOSQL (Databases or Database Management System) MONGO DB which is a document based NOSQL database .Here an hotel management system is been designed using HTML , CSS , Nodejs and express for making the website interactive and suitable for GUI based interaction collaborating with NOSQL MongoDB Database


FUNCTIONALITY OF THE WEBSITE :

- ❖ Database contains Employee and customer records.
- ❖ This website perform all CRUD operations(insert, update , delete, select).
- ❖ Using this website hotel staff can add new customer or Employee , can delete their data , or can update customer or Employee data.

WEBSITE SNAPSHOT:



INSERT OPERATION



Name
 Shantanu Kushwaha

Email
 shantanu@gmail.com

Phone
 9876543214

Date of joining
 06/01/2022
















Position
 swipper

Address
 gitikhadan Nagpur

Salary
 20000

Send

DISPLAY OPERATION

First Name	Last Name	Email Id	Phone No	Join Date	Position	Address	Salary	Activity
Julie	Sayyed	juliesayyed444@gmail.com	9579981433	Wed Nov 23 2022 05:30:00 GMT+0530 (India Standard Time)	Restaurant Manager	55,Anant Nagar Rathod layout Nagpur 440013	90000	 
Rashmi	Tiwari	Rashmi@gmail.com	7878979789	Mon Dec 27 2021 05:30:00 GMT+0530 (India Standard Time)	Head Chef	dharam path nagpur	85000	 
Diksha	gupta	gupta44@gmail.com	8793323004	Mon Dec 05 2022 05:30:00 GMT+0530 (India Standard Time)	Front Desk Manager	102, Civil Line Nagpur	65000	 
Jamal	Sayyed	jamal444@gmail.com	9373882990	Wed Jun 08 2022 05:30:00 GMT+0530 (India Standard Time)	Front Desk Employee	112,ANANT NAGAR RATHOD LAYOUT nagpur	35000	 
suaib	khm	suaib@gmail.com	9326928934	Wed Apr 20 2011 05:30:00 GMT+0530 (India Standard Time)	Housekeeping Employee	Suraj Nagar colony nagpur	15000	 
Shabnam	yadav	yadav@yahoo.com	5678234569	Wed Jan 23 2013 05:30:00 GMT+0530 (India Standard Time)	Housekeeping Employee	gafar nagar ,near chand apartment nagpur	15000	 
Mukesh	Yadav	mukesh@gmail.com	8765678973	Tue Nov 08 2022 05:30:00 GMT+0530 (India Standard Time)	senior Manager	gafar Nagar nagpur	75000	 
Shantanu	Kushwaha	shantanu@gmail.com	9876543214	Wed Jun 01 2022 05:30:00 GMT+0530 (India Standard Time)	swipper	gitikhadan Nagpur	20000	 

UPDATE OPERATION

Update Employee

First Name

Mukesh

Last Name

Yadav

Email

mukesh@gmail.com

Mobile

8765678973

Position

senior Manager

Address

gafor Nagar nagpur

















Salary

75000

Submit

[View All](#)

















UPDATE OPERATION RESULT

Emplyee Details								
First Name	Last Name	Email Id	Phone No	Join Date	Position	Address	Salary	Activity
Julie	Sayyed	juhiesayyed444@gmail.com	9579981433	Wed Nov 23 2022 05:30:00 GMT+0530 (India Standard Time)	Restaurant Manager	55,Anant Nagar Rathod layout Nagpur 440013	90000	 
Rashmi	Tiwari	Rashmi@gmail.com	7878979789	Mon Dec 27 2021 05:30:00 GMT+0530 (India Standard Time)	Head Chef	dharam path nagpur	85000	 
Diksha	gupta	gupta44@gmail.com	8793323004	Mon Dec 05 2022 05:30:00 GMT+0530 (India Standard Time)	Front Desk Manager	102, Civil Line Nagpur	65000	 
Jamal	Sayyed	jamal444@gmail.com	9373882990	Wed Jun 08 2022 05:30:00 GMT+0530 (India Standard Time)	Front Desk Employee	112,ANANT NAGAR RATHOD LAYOUT nagpur	35000	 
suaib	khan	suaib@gmail.com	9326928934	Wed Apr 20 2011 05:30:00 GMT+0530 (India Standard Time)	Housekeeping Employee	Suraj Nagar colony nagpur	15000	 
Shabnam	yadav	yadav@yahoo.com	5678234569	Wed Jan 23 2013 05:30:00 GMT+0530 (India Standard Time)	Housekeeping Employee	gafor nagar ,near chand apartment nagpur	15000	 
Mukesh	Yadav	mukesh@gmail.com	8765678973	Tue Nov 08 2022 05:30:00 GMT+0530 (India Standard Time)	Mnanager	gafor Nagar nagpur	80000	 
Shantam	Kushwaha	shantam@gmail.com	9876543214	Wed Jun 01 2022 05:30:00 GMT+0530 (India Standard Time)	swipper	gitichadan Nagpur	20000	 


DELETE OPERATION

localhost:3000 says
Are you sure to delete this record ?

OK Cancel

First Name	Last Name	Email Id	Phone No	Join Date	Position	Address	Salary	Activity
Julie	Sayed	juliesayed444@gmail.com	9579981433	Wed Nov 23 2022 05:30:00 GMT+0530 (India Standard Time)	Restaurant Manager	55,Anant Nagar Rathod layout Nagpur 440013	90000	 
Rashmi	Tiwari	Rashmi@gmail.com	7878979789	Mon Dec 27 2021 05:30:00 GMT+0530 (India Standard Time)	Head Chef	dharam path nagpur	85000	 
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Mukesh	Yadav	mukesh@gmail.com	8765678973	Tue Nov 08 2022 05:30:00 GMT+0530 (India Standard Time)	senior Manager	gafar Nagar nagpur	75000	 
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Mukesh	Yadav	mukesh@gmail.com	8765678973	Tue Nov 08 2022 05:30:00 GMT+0530 (India Standard Time)	senior Manager	gafar Nagar nagpur	75000	 

INFERENCES

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1. We studied and implemented queries in MongoDB which is a document based NOSQL database
2. We also learnt how to create a successful connection between HTML and MongoDB using Nodejs

***** E N D *****