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Assignment B2

Problem Statement: Design and develop MongoDB Queries using CRUD operations. (Use CRUD operations, SAVE method and logical operators)

Learning Objectives:
To understand and implement the CRUD operations in MongoDB

Learning Outcomes: The students will be able to:
1. Implement the commands on two tier
2. Implement the Database in MongoDB

Software and Hardware Requirements:
MongoDB CLI, Linux based OS

Concept Related Theory:

Mongo DB:
MongoDB is a cross-platform, document oriented database that provides, high performance, high availability, and easy scalability. MongoDB works on concept of collection and document. A single MongoDB server typically has multiple databases.

Collection
Collection is a group of MongoDB documents. It is the equivalent of an RDBMS table. A collection exists within a single database. Collections do not enforce a schema. Documents within a collection can have different fields. Typically, all documents in a collection are of similar or related purpose.

Document
A document is a set of key-value pairs. Documents have dynamic schema. Dynamic schema means that documents in the same collection do not need to have the same

set of fields or structure, and common fields in a collection's documents may hold different types of data.

Sample Document

```
{
   _id: ObjectId(...),
   title: 'MongoDB overview',
   description: 'Mongo is NoSQL DB',
   likes: 100
}
```

_id is a 12 bytes hexadecimal number which assures the uniqueness of every document. You can provide _id while inserting the document. If you didn't provide then MongoDB provide a unique id for every document. These 12 bytes first 4 bytes for the current timestamp, next 3 bytes for machine id, next 2 bytes for process id of mongodb server and remaining 3 bytes are simple incremental value.

Advantages of MongoDB over RDBMS

1. Schema less : MongoDB is document database in which one collection holds different documents. Number of fields, content and size of the document can differ from one document to another.
2. Structure of a single object is clear
3. No complex joins
4. Deep query-ability. MongoDB supports dynamic queries on documents using a document-based query language that's nearly as powerful as SQL
5. Tuning
6. Ease of scale-out: MongoDB is easy to scale
7. Conversion / mapping of application objects to database objects not needed
8. Uses internal memory for storing the (windowed) working set, enabling faster access of data.

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Logical Query Operators

1. $or - Joins query clauses with a logical OR and returns all documents that match the conditions of any clause
2. $and - Joins query clauses with a logical AND and returns all documents that match the conditions of all clauses.
3. $not - Joins query clauses with a logical NOR and returns all documents that fail to match any clause

Syntax: { $operator: [{<expr1>}, {<expr2>}, ...] }

4. $not - Returns all documents that do not match the query expression

Syntax: { $not: { <expr> } }

Conclusion:

Thus, we implemented various CRUD operations using logical operators and save method in MongoDB.