MSCIT SEM 1 - MONGODB

M.Sc.IT 1 MongoDB

Chapter 1:- * Unit 1:- Introduction to NoSQL Database

Topic:- What is Big Data?

Trailer:- (Only For Understanding)

(1) Defination of Bigdata and simple concept.

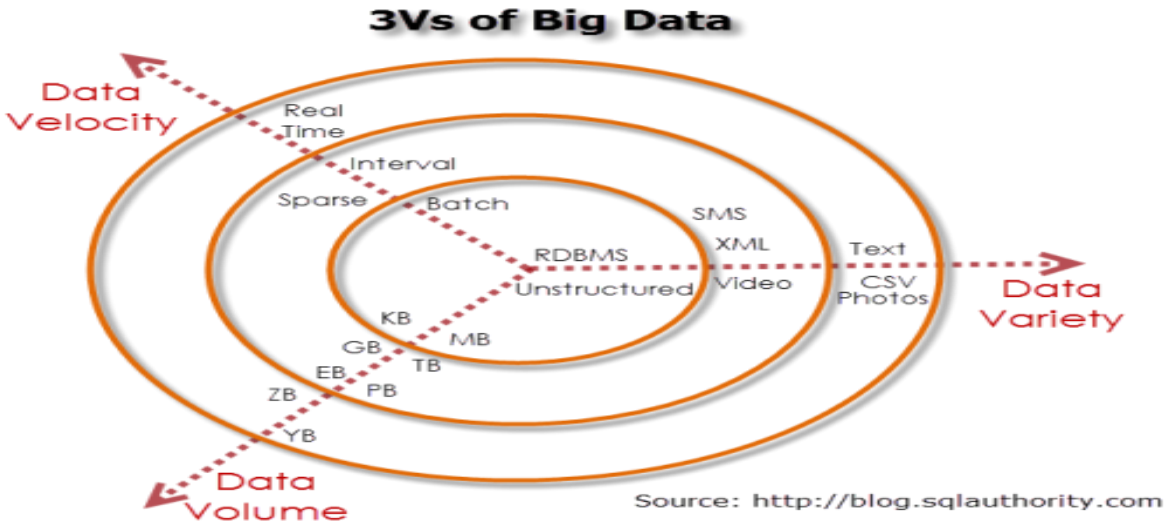
Details:- (For Exam)

Day by day, the amount of enterprise data has been increasing, and such large-scale data is referred to as ***big data***.

It includes huge data and the concept of data volume, variety and velocity.

Big data is a field for analyze systematically extracted information from data set that is too large and complex.

Now a day's many services and analytical applications are based on big data. For handling big data, advance technology is requiring for data storage.



Question	Answer
What is Big data?	Large or Huge amount of data
3v stands for ?	Volume, Variety, Velocity

Large scale data is refers as _____	Big data
Big data is require in_____	Analysis and many services

Students Outcomes:- Aware about bigdata and how it produced? different types etc.

Topic:- What is NoSQL?

Trailer:- (Only For Understanding)

(1) What is NoSQL? and Why it is used?

Details:- (For Exam)

NoSQL means “Not Only SQL”.

It is alternate solution of traditional databases where you have to put the data in tables and the structure have to follow, but NoSQL database provides a mechanism for storage and retrieval of data without any predefined schema for data insertion.

NoSQL databases mostly used for big data storage. NoSQL is design specifically to manage big data, a task for which commonly used relational database management systems (RDBMSs) is not well suited.

A NoSQL (originally referring to "non SQL" or "non relational") database provides a mechanism for storage and retrieval of data.

NoSQL databases are increasingly used in big data and real-time web applications. NoSQL systems are also sometimes called "Not only SQL" to emphasize that they may support SQL-like query languages.

NoSQL databases can be easily installed in cheap commodity hardware clusters as transaction and data volumes increase. This means that you can process and store more data at much less cost.

Question	Answer
NoSQL stands for ?	Not Only SQL
NoSQL design for ?	Handling large amount of data and database

NoSQL require schema ?	No
_____ is alternate solution of traditional databases	NoSQL
_____ provides a mechanism for storage and retrieval of data.	NoSQL Database
NoSQL databases are increasingly used in _____	big data and real-time web applications
you can process and store more data at much less cost with the help of _____	NoSQL Database
NoSQL also referred as	Non Relational
NoSQL databases can be easily installed in cheap commodity hardware clusters. Is it true?	Yes

Students Outcomes:- Here students will aware about the NoSQL term and its usage.

Topic:- NoSQL Features & Characteristics

Trailer:- (Only For Understanding)

(1) This question is for understanding the NoSQL concept and its features and characteristics.

Details:- (For Exam)

The three main features of NoSQL databases are

1. Scale-out
2. Replication
3. Flexible data structure

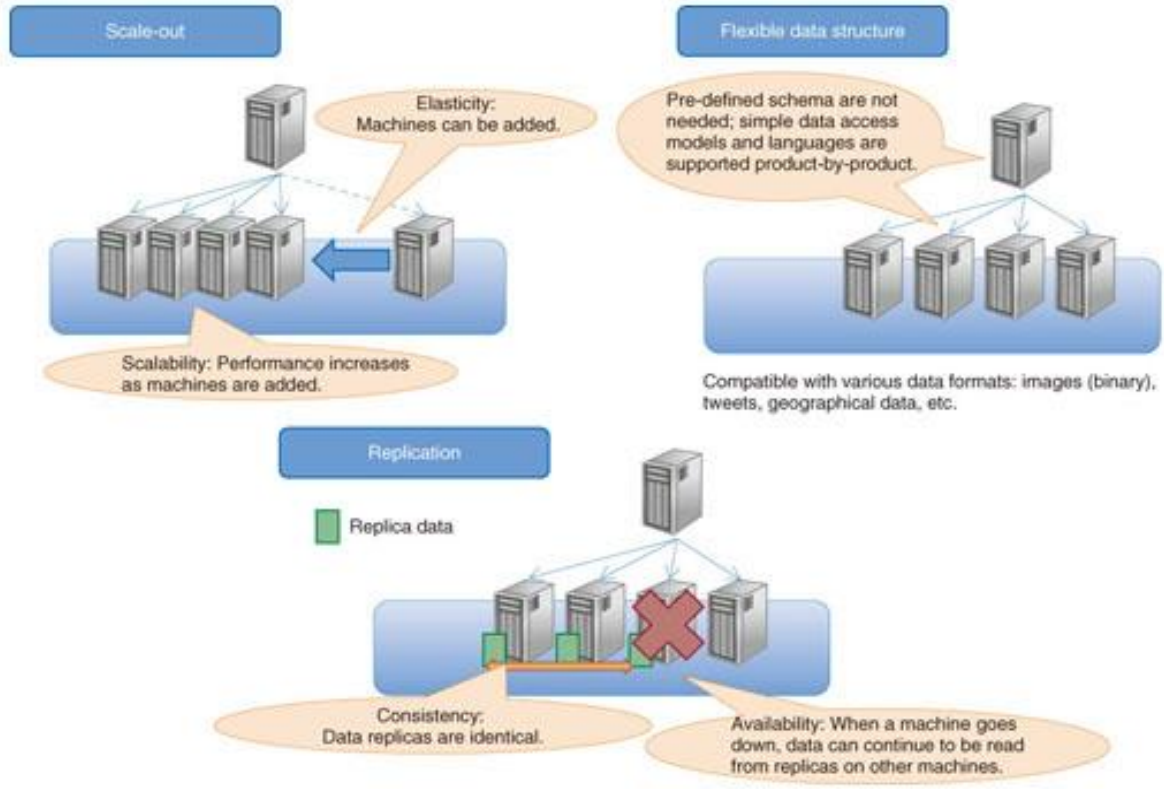


Fig. NoSQL database features and characteristics.

1. Scale-out

Scale-out refers to achieving high performance by using many machines in a distributed manner.

Distributing the data over a large number of machines enables scaling of the data set and distribution of the processing load.

A common feature of many NoSQL databases is that data is automatically distributed to new machines when they are added to the cluster, so the performance is also improved.

Scale-out is evaluated in terms of scalability and elasticity.

2. Replication

Replication is the copying of data to achieve data redundancy and load distribution.

Even if data consistency has been lost among the replicas, it is eventually achieved: this is known as *eventual consistency*.

Replication is evaluated in terms of consistency and availability.

3. Flexibility

A flexible data structure means that there is no need to define a structure as a *database schema*.

Traditional RDBMSs require pre-defined schemas, and redefining them carries a high cost. NoSQL, on the other hand, does not require defined schemas, so users can store data with various different structures in the same database table.

However, most NoSQL databases do not support high-level query languages such as SQL, which is used by RDBMS, so products that support either simple relational operations or indexing have been released.

This feature is evaluated qualitatively.

4. Elastic Scalability

RDBMSs are not as easy to scale out on commodity clusters, whereas NoSQL databases are made for transparent expansion, taking advantage of new nodes.

These databases are designed for use with low-cost commodity hardware.

Scalability indicates how the performance of a NoSQL database cluster scales with the number of physical machines.

If performance improves as machines are added to a NoSQL database cluster, we can say that the NoSQL product has high scalability.

5. Big data applications

While RDBMSs have grown to match the growing needs, but it's difficult to realistically use one RDBMS to manage such data volumes. These volumes are however easily handled by NoSQL databases.

6. Database administration

The best RDBMSs require the services of expensive administrators to design install and maintain the systems. On the other hand, NoSQL databases require much less hands-on management, with data distribution and auto repair capabilities, simplified data models and fewer tuning and administration requirements.

7. Economy

RDBMSs require installation of expensive storage systems and proprietary servers, while NoSQL databases can be easily installed in cheap commodity hardware clusters as transaction and data volumes increase. This means that you can process and store more data at much less cost.

8. Consistency

Consistency is a measure of the strength of data integrity. The parameters used to evaluate it include the number of replicas and the latency within the cluster. The consistency benchmarking software must check the consistency among replicas in an update-heavy workload, so data management of that workload, in which data should be updated, is necessary.

9. Availability

Availability refers to the ability of the overall system to continue operating during a network failure, called a *network partition*, or a physical machine failure.

High availability means that the system can work without interruption and without degraded performance, even when some machines go down and the network is partitioned or both.

Question	Answer
Main features of NoSQL ?	Scale-out, Replication, Flexible structure
Replication means ?	Multiple copy of data
Scale-out means ?	Machines can be added to increase the performance at any time in the system
Eventual consistency means ?	Even if data consistency has been lost among the replicas, it is eventually achieved
_____is a measure of the strength of data integrity.	Consistency
NoSQL can process and store more data at much less cost than RDBMS. Is	True

it true?	
_____refers to the ability of the overall system to continue operating during a network failure, called a *network partition*, or a physical machine failure.	**Availability**
Flexibility means _____	**No need to define structure or schema in advance**
Elastic scalability means_____	**Easy expansion or growth**
Replication means_____	**Multiple copies of data for load distribution**

Students Outcomes:- Here students will aware about NoSQL feature and its characteristics.

Topic:- History

Trailer:- (Only For Understanding)

(1) This question is about to understand that how NoSQL term started and what is the history?

Details:- (For Exam)

The term *NoSQL* was used by **"Carlo Strozzi in 1998**" to name his lightweight database.
It was NOSQL open source relational database that did not expose the standard SQL interface, but was still relational.

Most of the early **NoSQL systems did not attempt to provide** (ACID) atomicity, consistency, isolation and durability guarantees that will provided here.

Based **on 2014 revenue**, the NoSQL market leaders are MarkLogic, MongoDB, and Datastax.

Based on **2015 popularity rankings, the most popular NoSQL databases are MongoDB**, Apache Cassandra, and Redis.

Question	Answer
MongoDB is ?	**NoSQL database**
In 1998 who use the term NoSQL ?	**Carlo Strozzi**
NoREL refers as _____	**No Relational**

Early NoSQL systems support ACID?	**No**
The most popular NoSQL databases are...	**Mongodb, Apache Cassandra, Redis etc...**

Students Outcomes:- Here students will aware about how NoSQL term started?

Topic:- Types of NoSQL databases

Trailer:- (Only For Understanding)

(1) Yaha pe NoSQL ki main 4 types sikhne ko milti he. sab types ke alag alag data store area he.

Details:- (For Exam)

1. Key-value data stores:

Key-value (KV) stores use the **associative array** (also known as a map or dictionary) as their fundamental data model.
In this model, data is represented as a collection of key-value pairs, such that each possible key appears at most once in the collection.
The key-value model is one of the **simplest data models**, and richer data models are often implemented as an extension of it.

A key-value store, or key-value database, is a data storage model **designed for storing, retrieving, and managing associative arrays**, a data structure more commonly known as a dictionary or hash.

Dictionaries contain a collection of objects, or records, which in turn have many different fields within them, each containing data. These records are stored and retrieved using a key that **uniquely identifies the record**, and is used to **quickly find the data** within the database.

key-value systems offers considerable flexibility and more closely follows modern concepts like object-oriented programming.

Advantages:- efficiency, scalability, fault-tolerance. Data is stored sorted by key, very fast, very scalable, simple model, able to distribute horizontally

Disadvantage:- there is no client-server support built in to the library. Many data structures (objects) can't be easily modeled as key value pairs.

2. Document based data stores:-

A document-oriented database, or document store, is a computer program **designed for storing, retrieving, and managing document-oriented information**, also known as semi-structured data.

Document-oriented databases are **one of the main categories of NoSQL databases**, and the popularity of the term "document-oriented database" has grown with the use of the term NoSQL itself.

XML databases are a subclass of document-oriented databases that are optimized to work with XML documents. A document-oriented system depends on internal structure in the document in order to extract metadata that the database engine uses for further optimization.

One of the other defining characteristics of a document-oriented database is that **the database offers an API or query language that retrieves documents based on their contents.**

Document databases contrast strongly with the traditional relational database (RDB). Relational databases generally store data in separate tables that are defined by the programmer, and a **single object may be spread across several tables**.

Document databases store all information for a given object in a single instance in the database, and every stored object can be different from every other.

Advantages:-

unstructured data can be stored easily.
json format easier to write.
support rich queries and full indexes.
supports Map-Reduce queries.

Disadvantage:-

In SQL database, the database administrators and analysts can carefully design the schema for the table; once the schema is in place, programs can only add records that match that schema. This type of schema is not in document database.

3) Graph based data stores

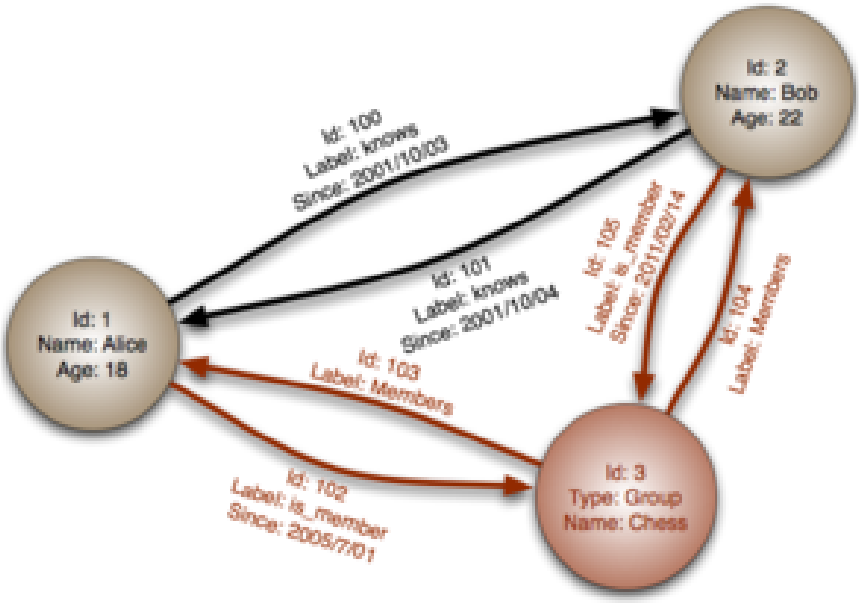
This kind of database is designed for data whose relations are **well represented as a graph** consisting of elements interconnected with a finite number of relations between them.

The type of data could be social relations, public transport links, road maps or network topologies.
It is based on the mathematical concept of graph theory.

Graph structures could be represented **in network model databases** from the late 1960s.

In computing, a graph database is a database that uses graph structures for queries with nodes, edges and properties to represent and store data.

A key concept of the system is the *graph* (or *edge* or *relationship*), which **directly relates data items in the store**.



Graph databases includes ---------- nodes, properties, and edges.

Graph databases are based on graph theory. Graph databases employ nodes, edges and properties.

- **Nodes represent** entities such as people, businesses, accounts, or any other item you might want to keep track of. They are roughly the equivalent of the *record*, *relation* or *row* in a relational database, or the *document* in a document database.

- **Edges, also** known as *graphs* or *relationships*, are the lines that connect nodes to other nodes; they represent the relationship between them. Meaningful patterns emerge when examining the connections and interconnections of nodes, properties, and edges.

- **Properties** are relevant information that relate to nodes.

4) Column based data store:-

These databases organize the data in tables, similar to an RDBMS, however, they store the content by columns instead of rows. They are good for data warehousing applications. Examples of column-based databases are Hbase,Cassandra, Hypertable, and so on.
A column of a distributed data store is a NoSQL object of the lowest level in a key space.

It is a tuple (a key-value pair) consisting of three elements:

- **Unique name:** Used to reference the column
- **Value: The** content of the column. It can have different types.
- **Timestamp: The** system timestamp used to determine the valid content.

The column is used as a store for the value and has a timestamp that is used to differentiate the valid content from old ones.

The primary benefit you can get by storing data in a column-oriented database is that some of your queries could become really fast.

Advantages:-

Not all the operations can be done online
Get and Put return result in milliseconds.
more efficient than row or document store

Question	Answer
Key-value stores use ?	Associative array
Key-value data model is like ?	Map or dictionary
Why Key-value data model is used ?	For fast data retrieval
Limitations of Key-value model is ?	Data cannot easily model in this structure
Advantage of Document based data store ?	Semi structured or Unstructured data can easily stored
What is collection ?	Group of documents
Graph base data store is like ?	Network model database
Node means ?	Any entity
Edge means ?	Graph of Relationship
Column base data store is like ?	Tables similar to RDBMS
Unique name is used for ____	Reference the column
What is Timestamp?	Timestamp used to determine the valid content
Give the definition of Edge.	Edge is the lines that connect nodes to other nodes.

Students Outcomes:- Here students will aware about the 4 types of NoSQL datastores.

Topic:-Locally hosted database and Distributed database

Trailer:- (Only For Understanding)

(1) Yaha pe students ko local and global hosted databases ka pura knowledge milega.

Details:- (For Exam)

A local database is one that is local to your application only. It support SQL Server CE (Compact Edition) format.

A "local database" is a database that is stored on the local PC where an application resides.

Distributed Database data can be store like in different system and user actually have to access the data like from request and response manner because user may not know the location of data in the computer.

Distributed database Advantages:-

1) In a distributed database, data can be stored in different systems like personal computers.
2) A user doesn't know where the data is located physically. Database presents the data to the user as if it were located locally.
3) Database can be accessed over different networks.
4) Data can be joined and updated from different tables which are located on different machines.
5) Even if a system fails the integrity of the distributed database is maintained.
6) A distributed database is secure.

Disadvantages:-

1) Since the data is accessed from a remote system, performance is reduced.
2) Static SQL cannot be used.
3) Network traffic is increased in a distributed database.
4) Database optimization is difficult in a distributed database.
5) Different data formats are used in different systems.
6) Different DBMS products are used in different systems which increases in complexity of the system.
7) Managing system catalog is a difficult task.
8) While recovering a failed system, the DBMS has to make sure that the recovered system is consistent with other systems.
9) Managing distributed deadlock is a difficult task.

Topic:- Database as a service (DBaaS)

Some cloud platforms offer options for using a database as a service, without physically launching a virtual machine instance for the database.

In such a configuration, application owners do not have to install and maintain the database themselves.

Instead, the database service provider have responsibility for installing and maintaining the database, and application owners pay according to their usage.

For example, Amazon Web Services provides three database services as part of its cloud offering: SimpleDB, a NoSQL key-value store; Amazon Relational Database Service, a SQL-based database service with a MySQL interface; and DynamoDB. Similarly, Microsoft offers the Azure SQL Database service as part of its cloud offering.

Architecture and common characteristics

Most database services offer web-based consoles, which the end user can use to provision and configure database instances.

For example, the Amazon Web Services web-console enables users to launch database instances, create snapshots (similar to backups) of databases, and monitor database statistics.

Database services consist of a database-manager component, which controls the underlying database instances using a service API. The service API is exposed to the end user, and permits users to perform maintenance and scaling operations on their database instances.

For example, the Amazon Relational Database Service's serviceAPI enables creating a database instance, modifying the resources available to a database instance, deleting a database instance, creating a snapshot (similar to a backup) of a database, and restoring a database from a snapshot.

The service provider is responsible for installing, patching and updating the software stack and ensuring the overall health and performance of the database.

Database services take care of scalability and high availability of the database.

The DBaaS model can also help reduce data and database redundancy and improve overall Quality of Service.

Database configuration installation can be done by db itself. It provide high scalability and high availability with proper maintenance of data.

Some db itself provides its own Dbaas like oracle provides 11g and 12c as cloud services. Most db services offer web based console.

Some db manager components provide many API for db services. For example create instance, create snapshot, monitoring, auto backup, security, reports, are the different services.

Dbaas solutions can reduces the costing with cloud based db so very much affordable and flexibility for small businesses.

The Dbaas model can also help for reduce the data and db redundancy and improve overall quality of service.

Question	Answer
Local hosted database store the data ?	Data stored in local area
Distributed Database store the data ?	Data can be stored in different system
DBaaS stands for ?	Database as a service
DBaaS model is helpful for ?	Reduce data redundancy and costing
A local database is one that is _____ to your application only.	Local
Database services take care of _____of the database	scalability and high availability
The DBaaS model helps to _____.	reduce data and database redundancy and improve overall Quality of Service
Database configuration installation can be done by _____	database itself
Most Database provides web based console services. true or false	True
Who is responsible for installing,	The service provider

patching and updating and ensuring the performance of the database.	

Students Outcomes:- Here students will aware about local data base and hosted database as well as how database works and provides services.

* Unit 2: Introduction to MongoDB

Topic:- MongoDB Concept

Trailer:- (Only For Understanding)

(1) MongoDB starting, Definition, Terms, Advantages etc are mentions here.

Details:- (For Exam)

MongoDB is an open-source report database, and heading NoSQL database. MongoDB is written in C, C++ and JavaScript

MongoDB is a cross-stage, archive arranged database that gives, superior, high accessibility, and simple adaptability. MongoDB deals with idea of accumulation and report.

Databases:-

Database is a physical compartment for storing data. Every database gets its own particular set of documents on the record framework. A single MongoDB server commonly has number of databases. The databases act as containers of data and they are independent of each other. A MongoDB database contains one or more collections.

Collections:-

Collections are a gathering of MongoDB documents. It has similar concept like a table in RDBMS. It exists inside a database. There is no need to define structure like tables of RDBMS.

Document:-

A document stored in a collection is a unit of data. A document contains a set of fields or key-value pairs. The keys are strings, the values can be of various types: strings, integers, floats, etc. You can even store a document as the value of a field in another document.

* Advantage of MongoDB over RDBMS:-

- MongoDB is record database in which one holds different files and records. Number of fields, substance and size of the record might be contrast starting with one record then onto the next.
- Structure is clear.
- No complex joins.
- Easy inquiry capacity.
- MongDB helps dynamic inquiries on records utilizing a record based inquiry language that is almost as capable as SQL.
- Tuning is good.
- Simplicity of scale-out: MongoDB is not difficult to scale.
- Transformation/ mapping is not required.
- Utilizes inward memory for empowering quicker get of data.

RDBMS	MongoDB
Database	Database
Table	Collection
Row	Document
Column	Field
Table Join	Embedded Documents
Primary Key	Primary Key (Default key _id provided by mongodb itself)
Database Server and Client	
Mysqld/Oracle	Mongod
mysql/sqlplus	Mongo

Question	Answer
Mongodb Collection in RDBMS known as ?	**Table**
Collection is used for ?	**Collecting or gathering mongodb documents**
Mongodb documents contains ?	**Set of fields or key value pair data.**

Students Outcomes:- Here students will get the knowledge about different terms and advantages of NoSQL and MongoDB.

Topic:- Downloading Installing and running MongoDB:-

Install MongoDB On Windows

Trailer:- (Only For Understanding)

(1) Students can easily install Mongodb by using the following steps.
(2) How to download Software from Website?

Details:- (For Exam)

(1) To install the MongoDB on windows, first download the latest release of MongoDB from http://www.mongodb.org/downloads

(2) Make sure you get correct version of MongoDB depending upon your windows version. To get your windows version open command prompt and execute following command

```
C:\>wmic os get osarchitecture
OSArchitecture
64-bit
C:\>
```

32-bit versions of MongoDB only support databases smaller than 2GB and suitable only for testing and evaluation purposes.

(3) Now extract your downloaded file to c:\ drive or any other location.
Make sure name of the extracted folder is is the version of MongoDB download.

(4) In case you have extracted the mongodb at different location, then go to that path by using command **cd FOLDER/DIR** and now run the above given process.

(5) MongoDB requires a data folder to store its files. The default location for the MongoDB data directory is c:\data\db. So you need to create this folder using the Command Prompt. Execute the following command sequence

```
C:\>md data

C:\cd data

C:\data\md db
```

(6) If you have installed the MongoDB at different location, then you need to specify any alternate path for **\data\db** by setting the path dbpath in mongod.exe. For the same issue following commands

In command prompt navigate to the bin directory present into the mongodb installation folder. Suppose my installation folder is **D:\set up\mongodb**

```
C:\Users\XYZ>d:
D:\>cd "set up"
D:\set up>cd mongodb
D:\set up\mongodb>cd bin
D:\set up\mongodb\bin>mongod.exe --dbpath "d:\set up\mongodb\data"
```

This will show **waiting for connections** message on the console output indicates that the mongod.exe process is running successfully.

(7) Now to run the mongodb you need to open another command prompt and issue the following command c:\mongodb

```
D:\set up\mongodb\bin>mongo.exe

MongoDB shell version: 2.4.6

connecting to: test

>db.test.save( { a: 1 } )

>db.test.find()

Output .....
```

> This will show that mongodb is installed and run successfully. Next time when you run mongodb you need to issue only commands.

* Install MongoDB on Ubuntu

(1) Run the following command to import the MongoDB public GPG Key:

```
sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv 7F0CEB10
```

(2) Create a /etc/apt/sources.list.d/mongodb.list file using the following command.

```
echo 'deb http://downloads-distro.mongodb.org/repo/ubuntu-upstart dist 10gen' | sudo tee /etc/apt/sources.list.d/mongodb.list
```

(3) Now issue the following command to update the repository:

```
sudo apt-get update
```

(4) Now install the MongoDB by using following command:

```
apt-get install mongodb-10gen=2.2.3
```

(5) In the above installation 2.2.3 is currently released mongodb version. Make sure to install latest version always. Now mongodb is installed successfully.

Start MongoDB

```
sudo service mongodb start
```

Stop MongoDB

```
sudo service mongodb stop
```

Restart MongoDB

```
sudo service mongodb restart
```

To use mongodb run the following command

```
mongo
```

This will connect you to running mongod instance.

Students Outcomes:- Here students will aware about how to download and setup the MongoDB and which commands are used for it?

Topic:- Configuring MongoDB

Trailer:- (Only For Understanding)

(1) After installation completed how to configure and use MongoDB?

Details:- (For Exam)

There are some default configuration setting for running MongoDB but we can set them also manually by following ways.

There are two ways to configure MongoDB.

(1)We can modify them by command-line parameters

(2) By using File-based configurations.

(1) Command Line parameters

We can override the default MongoDB settings by passing command-line parameters to the mongod program.

For example, the next command tells MongoDB to use C:\mongodb_data as data directory by sending it as a --dbpath argument:

C:\>mongodb\bin\mongod --dbpath C:\mongodb_data

The following table lists some useful command-line parameters and their functions:

Parameter	What it does
`--dbpath`	Path to the directory for storing data files.
`--bind_ip`	IP address that the `mongod` server will listen on, default is `127.0.0.1`.
`--port`	Port address that `mongod` will listen on, default is `27017`.
`--logpath`	Full file path to the log file where the MongoDB messages will be written. By default all messages are written to standard output.
`--logappend`	Setting this option to true appends the messages at the end of the log file. Setting it to `false` overwrites the log.

(2) File based configuration

An alternative to sending all those command-line parameters to mongod manually is to put the required configuration settings in a file and then pass the path of the file as a --config option.

For example, consider the following sample configuration file:
dbpath = D:\mongodb_data
logpath = D:\mongodb.log

logappend = true

We store this file to a location, say C:\mongodb.conf. Now, to start MongoDB with these settings, we have to enter the next command in the CMD prompt:

C:\>mongodb\bin\mongod --config C:\mongodb.conf

mongod will be loaded with these configuration settings. Note that file-based parameters are the same as those for command-line options.

* Stopping MongoDB

There are several ways you can shutdown a running MongoDB server.

In the terminal window (or CMD prompt window in case you are on Windows) running the mongod process, hit Ctrl + C . This will signal the server to do a clean shutdown, flush, and close its data files.

From the mongo shell

From the mongo interactive shell, you can issue a shutdownServer() command , causing mongod to terminate:
>use admin

switched to db admin

>db.shutdownServer()

Students Outcomes:- Here students will aware about how MongoDB starts and stop? Different configuration setting.

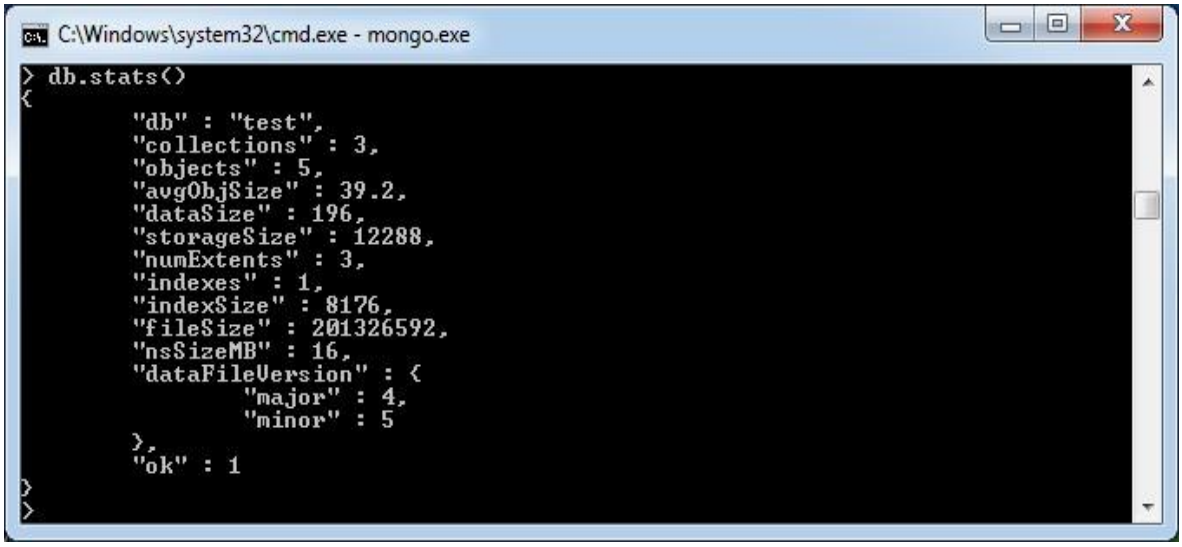
Topic:- MongoDB Statistics

Trailer:- (Only For Understanding)

(1) MongoDB statistics commands

Details:- (For Exam)

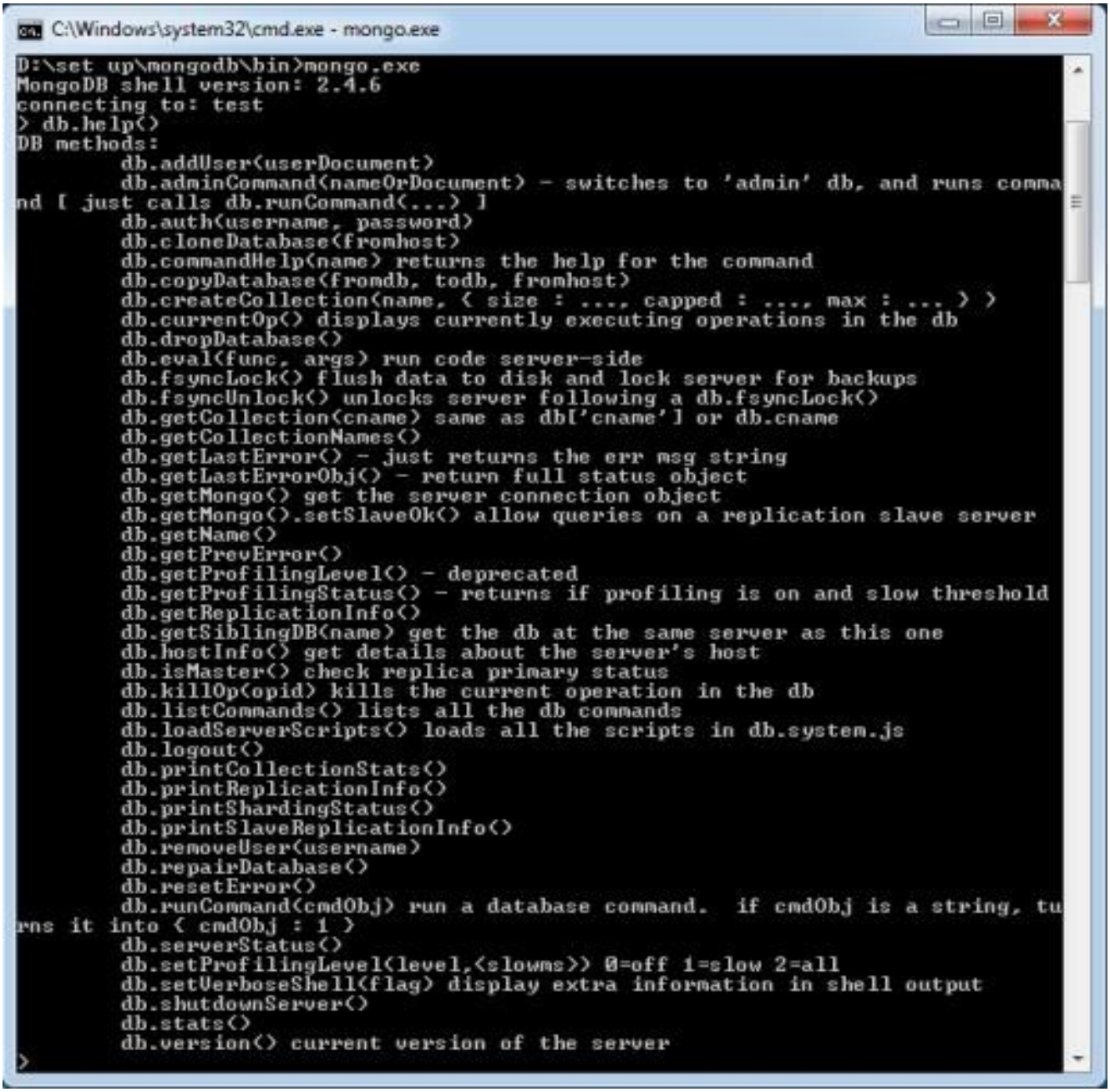
To get stats about mongodb server type the command **db.stats()** in mongodb client. This will show the database, name, cumber of collection and documents in the database. Output the command is shown below:



Students Outcomes:- Here students will aware about different commands.

* MongoDB Help

To get list of commands type **db.help()** in mongodb client. This will give you list of commands as follows:



Topic:- Installing the PHP MongoDB driver on Unix

Trailer:- (Only For Understanding)

(1) Students aapko php and mongodb connect kese karte he ye sikhne ko milega.
(2) Konse driver use kare aur kese connectivity kare?

Details:- (For Exam)

In a Unix-based system, the PHP driver for MongoDB can be installed using the PECL Program (PECL - PHP Extension Community Library)

You need to have it installed on your machine, which can be done by using the following command:

sudo pecl install mongo

When the installation is finished, edit the php.ini file (usually found at /etc/php.ini) to add the line:
extension=mongo.so
and then restart Apache.

In case you don't have pecl installed on your machine, you can download the driver source code from GitHub, build it, and install it manually:

$ tar zxvf mongodb-mongdb-php-driver-<commit_id>.tar.gz
$ cd mongodb-mongodb-php-driver-<commit_id>
$ phpize
$ ./configure
$ sudo make install

Check out the Mongo driver installation page

http://www.php.net/manual/en/mongo. installation.php on the PHP official website to get operating system specific detailed information.

Topic:- Installing the PHP driver for MongoDB on windows

Trailer:- (Only For Understanding)

(1) Students aapko php and mongodb connect kese karte he aur kon se driver use karne padte he ye sab isme aapko shikhne ko milega.

Details:- (For Exam)

Steps:-

Step – 1 : Download the ZIP archive http://downloads.mongodb.org/mongo-latest-php5.2vc6ts.zip on your machine and extract it.

Step – 2 : Copy the php_mongo.dll file from the extracted folder to the PHP extension directory; this is usually the folder name ext inside your PHP installation.

Step -3 : Open the php.ini file inside your PHP installation and add the following line:

extension=php_mongo.dll

Step – 4 : Save the file and close it. Restart the Apache web server.

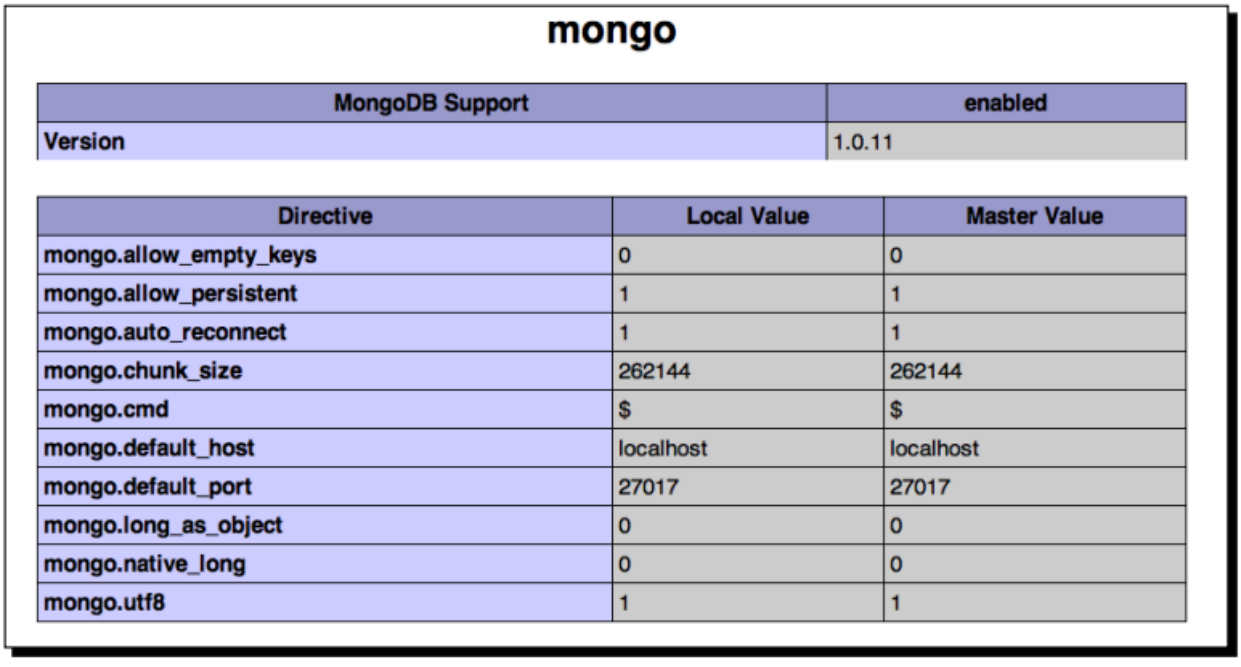
Step – 5 : Open up your text editor and add the following code to a new file:

```
<?php
phpinfo();
```

Step – 6 : Save the file as phpinfo.php inside the DocumentRoot of the Apache web server (the htdocs folder).

Step – 7 : Execute the phpinfo.php script in your browser

(http://localhost/phpinfo.php). Scroll down to find the section mongo to see all the MongoDB driver-specific information.



mongo

MongoDB Support	enabled
Version	1.0.11

Directive	Local Value	Master Value
mongo.allow_empty_keys	0	0
mongo.allow_persistent	1	1
mongo.auto_reconnect	1	1
mongo.chunk_size	262144	262144
mongo.cmd	$	$
mongo.default_host	localhost	localhost
mongo.default_port	27017	27017
mongo.long_as_object	0	0
mongo.native_long	0	0
mongo.utf8	1	1

Congratulations! You have successfully installed the PHP driver for MongoDB.

Students Outcomes:- Here students will be able to understand the connectivity and driver require for mongodb with php in windows and unix operating system.

Topic:- Connecting to the MongoDB Server from PHP

Trailer:- (Only For Understanding)

(1) Practical Programs for connectivity.

Details:- (For Exam)

Use the API provided by the PHP-MongoDB driver to create a connection to the Mongo server from a PHP script.

Creating a connection to the MongoDB server from PHP

Step – 1 : Open up your text editor and add the following code in a new file:

```
<?php
try{
$mongo = new Mongo(); //create a connection to MongoDB
$databases = $mongo->listDBs(); //List all databases
echo '<pre>';
print_r($databases);
$mongo->close();
} catch(MongoConnectionException $e) {

//handle connection error

die($e->getMessage());
}
```

Step -2 : Save the file as test_connection.php under the DocumentRoot of your web server.

Step – 3 : Open up your browser, and execute the script by going to the location

http://localhost/test_connection.php:

Configuring the PHP MongoDB Connection

When no parameter is passed to the constructor of the Mongo class, it connects to the Mongo server running on localhost, on port 27017 (or whatever value is specified for mongo.default_host and mongo.default_port in php.ini).

If we want to connect to a server running on a different host and/or port, we can pass the connection string (mongodb://<hostname>:<port_number>) as the $server parameter to the Mongo constructor.

For example, to connect to a Mongo server listening on port 8888, we will type the following command:

$mongo = new Mongo($server="mongodb://localhost:8888");

Topic:- The Data Model and Working with Data

Trailer:- (Only For Understanding)

(1) The data structure and data model of how the data store internally? and how to embedded and normalized the data?

Details:- (For Exam)

The Data Model and Working with Data

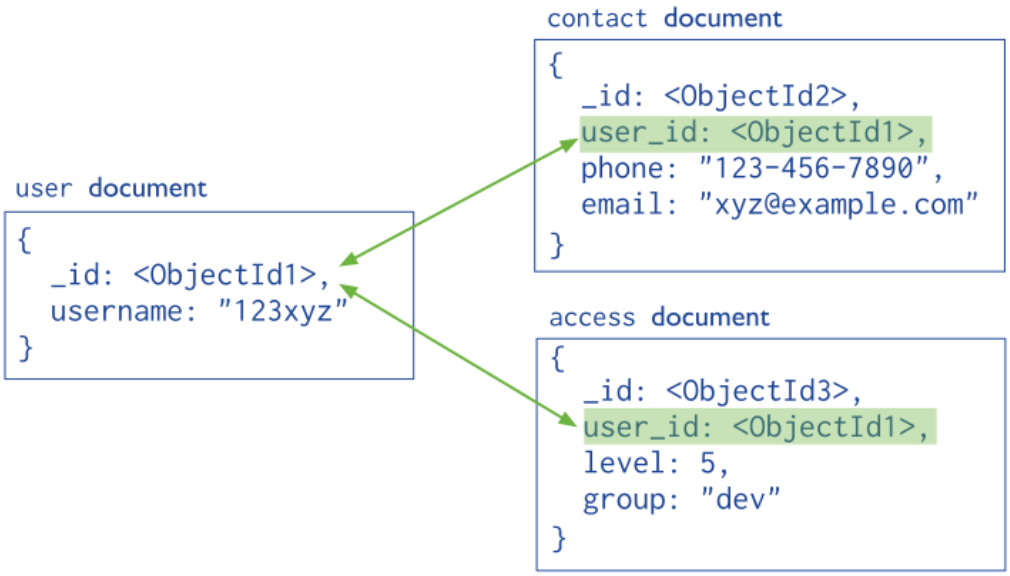
With MongoDB, you may embed related data in a single structure or document.

These schema are generally known as “denormalized” models, and take advantage of MongoDB’s rich documents. Consider the following diagram:

Embedded data models allow applications to store related pieces of information in the same database record.

As a result, applications may need to issue less queries and updates to complete common operations.

Normalized Data Models



Document databases such as *MongoDB* use *JSON* documents in order to store records, just as tables and rows store records in a relational database.

Question	Answer
Which command is used to know the os architecture of your computer ?	wmic os get OS architecture in command prompt
Which folder you can create in c: drive to keep the data of mongodb	data folder in c: drive
To start the mongodb in unix which command is used ?	Sudo service mongodb start
Which is configuration file of php ?	Php.ini
Db.help() display ?	List of commands
--dbpath command is used for ?	Path to the directory for storing the data files
Which is default port of mongod server	27017

Which dll file you require to configure php with mongodb	**Php_mongo.dll**
Mongodb support which data model	**Embedded data model**

Students Outcomes:- Here students will aware about the internal structure of data and its embedded and normalized data model.

Note:- Above material and examples reference will be taken by many online platforms.