THE NEW COLLEGE (AUTONOMOUS), CHENNAI-14.

DEPARTMENT OF COMPUTER APPLICATIONS – SHIFT - II

STUDY MATERIAL

SUBJECT: OPEN SOURCE TECHNOLOGIES SUB CODE: 20BHM615

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UNIT-V

1. INTRODUCTION TO MEAN STACK

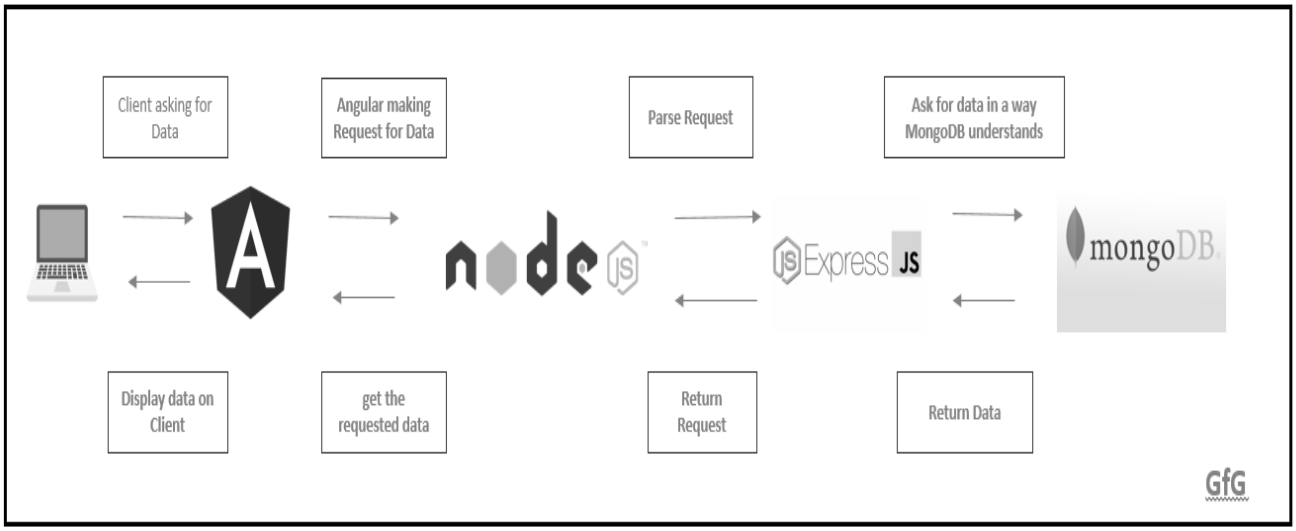
MEAN Stack is one of the most popular Technology Stack. It is used to develop a Full Stack Web Application. Although it is a Stack of different technologies, all of these are based on JavaScript language.

MEAN Stands for:

- **MongoDB** − Database System
- **Express** − Back-end Web Framework
- **AngularJS** − Front-end Framework
- **Node.js** − Web Server Platform

This stack leads to faster development as well as the deployment of the Web Application. Angular is Frontend Development Framework whereas Node.js, Express, and MongoDB are used for Backend development as shown in the below figure.

Flow of Data in MEAN Stack Application: Here, each module communicates with the others in order to have a flow of the data from Server/Backend to Client/Frontend.



2. EXPRESS – DATABASE

We keep receiving requests, but end up not storing them anywhere. We need a Database to store the data. For this, we will make use of the NoSQL database called **MongoDB**.

To install and read about Mongo, follow this link.

In order to use Mongo with Express, we need a client API for node. There are multiple options for us, but for this tutorial, we will stick to mongoose. Mongoose is used for **document Modeling** in Node for MongoDB. For document modeling, we create a **Model** (much like a **class** in document oriented programming), and then we produce **documents** using this Model (like we create **documents of a class** in OOP). All our processing will be done on these "documents", then finally, we will write these documents in our database.

Setting up Mongoose

Now that you have installed Mongo, let us install Mongoose, the same way we have been installing our other node packages −

```
npm install --save mongoose
```

Before we start using mongoose, we have to create a database using the Mongo shell. To create a new database, open your terminal and enter "mongo". A Mongo shell will start, enter the following code −

```
use my_db
```

A new database will be created for you. Whenever you open up the mongo shell, it will default to "test" db and you will have to change to your database using the same command as above.

To use Mongoose, we will require it in our **index.js** file and then connect to the **mongodb** service running on **mongodb://localhost**.

```
var mongoose = require('mongoose');
mongoose.connect('mongodb://localhost/my_db');
```

Now our app is connected to our database, let us create a new Model. This model will act as a collection in our database. To create a new Model, use the following code, before defining any route −

```
var personSchema = mongoose.Schema({
```

```
  name: String,
  age: Number,
  nationality: String
});
var Person = mongoose.model("Person", personSchema);
```

The above code defines the schema for a person and is used to create a Mongoose Mode **Person**.

3. 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.

Database

Database is a physical container for collections. Each database gets its own set of files on the file system. 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.

The following table shows the relationship of RDBMS terminology with MongoDB.

RDBMS	MongoDB
Database	Database
Table	Collection
Tuple/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

~~~ End of Unit-IV~~~
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