**16L4302**

**Question1.**

**MongoDB vs Mongoose. Why are we using Mongoose package instead of MongoDB package? How would we perform CRUD operations using the MongoDB package? Give code examples for creating, retrieving, updating and deleting MongoDB documents.**

**ANSWER:**

MongoDB vs Mongoose

In terms of Node.js,mongodb is the **native driver** for interacting with a mongodb instance and mongoose is an **Object modeling tool** for MongoDB.Mongoose is built upon the MongoDB driver to provide programmers with a way to model their data.

Using Mongoose, a user can define the schema for the documents in a particular collection.Mongodb doesn’t need any fixed schema. You can insert or update whatever and however you want.

Why are we using Mongoose package:

Because Using Mongoose, a user can define the schema for the documents in a particular collection. It provides a lot of convenience in the creation and management of data in MongoDB .Mongoose is one of the orm's(Object Relational Mapping) who give us functionality to access the mongo data with easily understandable queries.Mongoose plays as a role of abstraction over your database model.This even gives a structure and more maintainability to your application code.

CRUD operations

**insert operations** add new documents to a collection.

db.collection.insertOne()

db.collection.insertMany()

Example:

db.user.insertOne( ----->collection

{name:”noor”,age:10,status:”pending”} ----->field:value

)

**Read operations** retrieves documents from a collection

Db.collection.find()

Example:

Db.users.find( ----->collection

{Age:{&lt:18}}, ----->query criteria

{name:1,address:1} ----->projection

).limit(5) ----->cursor modifier

**Update operations** modify existing documents in a collection

db.collection.updateOne()

db.collection.updateMany()

db.collection.replaceOne()

Example:

db.user.updateMany( ----->collection

{Age:{&lt:18}}, ----->update filter

{&set:{status:”reject”}} ----->update action

)

**Delete operations** remove documents from a collection

db.collection.deleteOne()

db.collection.deleteMany()

Example:

db.user.deleteMany( ----->collection

{status:”reject”}} ----->delete filter

)

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**Question 2**

**POST vs PUT. Why was POST used to update employee data in the Employees sample AJAX application? What happens if you replace POST with PUT? What difference does it make?**

**Answer**

**POST vs PUT**.

PUT methods are all about updating existing documents or sub-documents in the database, and then returning the saved data as confirmation.The PUT method requests that the enclosed entity be stored under the supplied Request-URI.if the Request -URI refers to an already existing resource,the enclosed entity should be considered as a modified version of the one residing on the origin server .If the Request URI does not point to an existing recourse, and that URI is capable of being defined as a new resource by the requesting user agent ,the origin server can create the resource with that URI.

POST methods are all about adding new documents or sub-documents in the database.The POST method is used to request that the origin server accept the entity enclosed in the request as a new subordinate of the resource identified by the Request -URI in the Request-Line.

The type of the requests are "POST" and "GET". Other request types, such as "PUT" and "DELETE" can be used, but they may not be supported by all browsers.jQuery provides Ajax support that abstract away painful browser differences.It offers both a full-featured $.ajax() method ,and simple convience methods such as $.get(),$getScrit(),$.getJSON() and $.fn.load().That is why we used POST to update data instead of PUT.

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**QUESTION 3**

**PUT vs PATCH. Can PUT be used for partial updates e.g. in case of updating your name in an online university application form what method should be used? PUT or PATCH or anyone? Why? (2)**

**ANSWER:**

**PUT vs PATCH**

In a PUT request, the enclosed entity is considered to be a modified version of the resource stored on the origin server, and the client is requesting that the stored version be replaced.

With PATCH, however, the enclosed entity contains a set of instructions describing how a resource currently residing on the origin server should be modified to produce a new version.

Also, another difference is that when you want to update a resource with PUT request, you have to send the full payload as the request whereas with PATCH, you only send the parameters which you want to update.

partial updates

The put method is already defined to overwrite a resource with a complete new body ,and cannot be reused to do partial changes .Otherwise ,proxies and catches ,and even clients and servers ,may get confused as to the result of the operation .The PATCH method should be used whenever you would like to change or update just a small part of the state of the resource. You should use the PUT method only when you would like to replace the resource in its entirety. In case of updating your name in an online university application form Patch method should be used.

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**QUESTION 4**

**Where does React lie in comparison to AngularJS? Compare with respect to advantages and disadvantages.**

****ANSWER:****

The main differences between AngularJS (Framework) and React (the library) are following:

- **Data binding**. Angular uses a MVC approach with two-way data binding which means that when you change the model, the view changes automatically too. In Reacts downward one-way data binding, child elements don’t affect parents which makes the code more stable but requires manual updates.

- **Virtual vs direct DOM**. Unlike Angular, ReactJS uses virtual DOM which leads to fast updates and dynamic UI, that is especially important for single page apps.

- **Framework vs library**. It’s important to mention that ReactJS is actually a library while Angular is a framework. The difference is that with Angular, you have to confront its structure and don’t have much customization freedom. This can be both a blessing and a curse since it’s easier to have new developers join your project with Angular, while React’s fluidity and “build-your-own” approach enables you to make more decisions and therefore - spend more time syncing it all up.

-**Resolving Dependencies**. The difference between React and AngularJS with regards to dependency injection is that React doesn’t offer any concept of a built-in container for dependency injection. But this doesn't mean we have to think of a method to inject dependencies in our React project. You can use several instruments to inject dependencies automatically in a React application. The only challenge is to pick a tool to use.

-**Easy and Simple** Using build systems like webpack ,gulp and grunt for ES5 in React is much simpler than compared to Angular ,As Angular does not provide easy walkthroughs for build systems and module patterns

**-**Componentization**.** AngularJS has a very complex and fixed structure because it's based on the Model-View-Controller architecture . An object $scope in AngularJS is responsible for the Model part, which is initialized by the Controller and then transformed into HTML to create the View for the user. AngularJS provides many standard services, factories, controllers, directives, and other components.There is no “correct" structure for applications built with React.It is a large JavaScript library that helps us update the View for the user. But React still doesn't let us create applications on its own. The library lacks the model and controller layers. React provides a very simple and efficient way to build component trees. It boasts a functional programming style where component definitions are declarative. Composing your app from React components is like composing a JavaScript program from functions.

-**Performance.** React introduced the concept of the virtual DOM, which is one of the greatest advantages of React in comparison with AngularJS.Now, instead of sending completely new HTML to the browser, React sends the HTML only for the changed element. This approach is much more efficient than what AngularJS offers.

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**QUESTION 5**

**What is Vue.js? Where does Vue lie in comparison to React and AngularJS? Give examples.**

**Answer**

Vue is a progressive framework for building user interfaces.Unlike other monolithic frameworks,Vue is designed from the ground up to be incrementally adoptable .The core library is focused on the view layer only ,and is easy to pick up and integrate with other libraries or existing projects .Vue is also perfect capable of powering sophisticated Single Page Applications when used in combination with modern tooling and supporting libraries

**Comparison**

****Angular**** is a TypeScript-based JavaScript framework.****React**** is described as “a JavaScript library for building user interfaces”.****Vue**** is one of the most rapidly growing JS frameworks in 2016. Vue describes itself as a “Intuitive, Fast and Composable MVM for building interactive interfaces”.

Advantages of Vue over Angular are following:

-The framework is much easier to learn

-No TypeScript imposition

-vue with Veux enable (similar to Redux) and vue router is much easier out of the box than the AOT-compiled angular-cli application.

Advantages of Vue over React are following:

-Ease of integration into finished project

-Automatic tracking of component dependencies during rendering

-The availablity of a CLI with several assembly systems

When you want lightweight ,faster ,and modern UI library for crafting a top-notch SPA,you can opt for Vue,js.It is advantageous for designers who are used to work with HTML.Also,it provide re -usability of the components making it developers pick to build unmatched user experience in web applications ,if you want to integrate a front -end JavaScript framework into an existing application .Vue is a better choice

**EXAMPLE**

At the core of Vue.js is a system that enables us to declaratively render data to the DOM using straightforward template syntax:

<div id="app">

{{ message }}  
</div>

var app = new Vue({  
 el: '#app',  
 data: {  
 message: 'Hello Vue!'  
 }  
})

**output**

Hello Vue!

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**Question 6**

**How is AngularJS different from Angular2+? Give examples.(4)**

**ANSWER:**

## **Frameworks :**AngularJS follows the traditional MVC architecture that comprises a model, a view and a controller.whereas the architecture of Angular 2+ is based on service/controller.

## **Templates :**In AngularJS the template is written using HTML. To make it dynamic, you can add AngularJS-specific code such as attributes, markups, filters and form controls.In Angular, AngularJS’s template structure was reworked and lots of new features were added to the templates. The primary difference was that each component had a template attached to it. All the HTML elements except <html>, <body>, <base>, and <script> work within the template.. Built-in attribute directives like NgClass, NgStyle and NgModel and built-in structural directives such as NgIf, NgForOf, NgSwitch are also part of the template.

**Dependency Injection :** AngularJS has an injector subsystem that’s responsible for creating components, injecting dependencies and resolving the list all dependencies. The following components can be injected on an on-demand basis:

* value
* factory
* service
* provider
* constant

Although the approach has stayed the same, Angular has a newer dependency injection system that’s different from that of the older DI pattern. Angular’s dependency injection is managed through the @Ngmodule array that comprises providers and declarations . The declarations array is the space where components and directives are declared. Dependencies and services are registered through the providers array.

## **JavaScript vs TypeScript**:AngularJS is a pure JavaScript framework, and models in AngularJS are plain old JavaScript objects. This makes the whole process of setting up the project a lot easier.Angular 2+ introduced TypeScript as the default language for building applications. TypeScript is a syntactic superset of JavaScript that compiles down to plain JavaScript.

## **Tooling Support** :AngularJS didn’t have an official CLI, but there were many third-party generators and tools available. AngularJS has a browser extension for debugging and testing called ng-inspector. The structure of AngularJS allowed third-party modules to be imported without any hassle. You can find all the popular ng modules at [ngmodules.org](http://ngmodules.org/), which is an open-source project for hosting AngularJS modules.Angular has more tooling support compared to AngularJS. There’s an official CLI that lets you initialize new projects, serve them and also build optimized bundles for production. You can read more about Angular CLI at Git-hub. Because Angular uses TypeScript instead of JavaScript, Visual Studio is supported as an IDE. That’s not all. There are many IDE plugins and independent tools that help you automate and speed up certain aspects of your development cycle. Augury for debugging, NgRev for code analysis, Codelyzer for code validation etc , are pretty useful tools

## **Conclusion:**Each version of Angular has significant benefits. Angular is decidedly faster than AngularJS, has a mobile-driven approach, executes better with components, and enables smoother migration from earlier versions.

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**QUESTION7:**

**What is Linting? What is the use of JSLint? What is the use of ESLint? Give examples.**

**ANSWER:**

**Linting** is the process of checking the source code for programmatic as well as stylish errors .This is most helpful in identifying some common and uncommon mistakes that are made during coding.

A lint is a program that support linting .They are available for most languages like JavaScript ,CSS,html,etc.

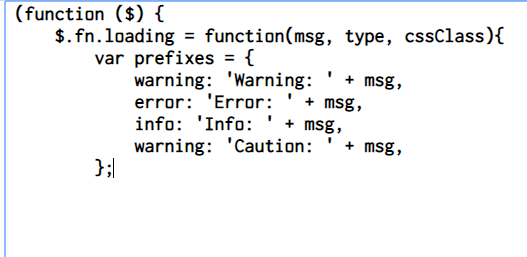
**JSLint** is a tool which helps you optimize your JavaScript code by telling you the problem areas and suggesting solutions for the same.

**ESlint** is similar to JSLint. It is the tool for linting Node.js packages ,and can be configured to enforce multiple coding styles.It is also possible to define your own style.

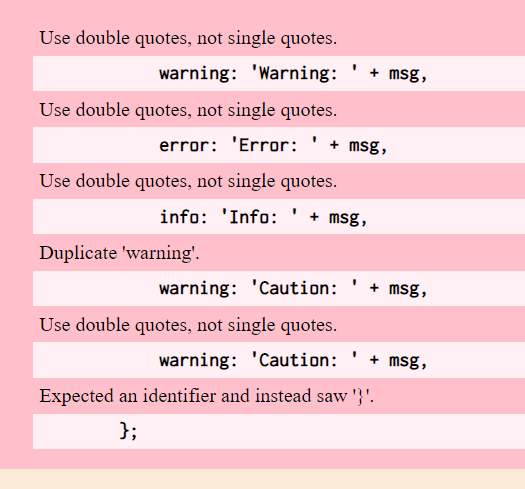
It can automatically fix many syntactic problems ,this should be the first tool you can use to clean up your source code .

**EXAMPLE**

**Code with errors**



After Linting (JSLint)



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**Question 8**

**Give an example where you would prefer to use AngularJS over AJAX and vice versa**

**Answer:**

**AJAX** stands for “Asynchronous JavaScript and XML“, and is a way that a webpage can use JavaScript to send and receive data from a server without refreshing a webpage.You can think of AJAX as a way to communicate (send requests and get responses) with the server without refreshing. i.e. Asynchronously.

AngularJS is a full fledged, front end MVC framework which does a lot more. It extends the above ($http module) with a lot of neat features such as 2-way data binding, templating, filters and directives etc.One is feature or say way to attain a certain functionality while other is a big framework which include many other functionalities along with Ajax.

Ajax is the feature which allows you to update the part of the page without update or refresh the page while AngularJS is one of the JavaScript framework (to be specific) client side MVC framework (most says MVW, where W is whatever that is MVC/MVVM )

-------Ajax only lets you make HTTP calls to server while Angular is complete framework including Ajax.If you just want to add HTTP requests capability to your app just use Ajax. If you want to build complete Single Page Application use Angular (or other web frameworks).

--------Even before AngularJS Ajax calls were used (today also) to update the particular part of a page and now you can use Angular for too for Ajax calls.  
--------- Ajax is very important part in Ajax , As AngularJS is Front-End Framwork .So in order to Perform CRUD operations ( Create , Read , Update , Delete Data ) AngularJS uses Ajax .