

MERN Stack Assignment 4

1. What exactly is a MERN stack, and what does it imply?

MERN stands for MongoDB, Express, React, Node, after the four key technologies that make up the stack.

MongoDB - document database

Express(.js) - Node.js web framework

React(.js) - a client-side JavaScript framework

Node(.js) - the premier JavaScript web server

Express and Node make up the middle (application) tier. Express.js is a server-side web framework, and Node.js the popular and powerful JavaScript server platform. Regardless of which variant you choose, ME(RVA)N is the ideal approach to working with JavaScript and JSON, all the way through.

The MERN architecture allows you to easily construct a 3-tier architecture (frontend, backend, database) entirely using JavaScript and JSON.

2. What exactly is REACT JS, and how does it work?

React is a JavaScript library (not a framework) that creates user interfaces (UIs) in a predictable and efficient way using declarative code. You can use it to help build single page applications and mobile apps, or to build complex apps if you utilise it with other libraries.

We use declarative code to create components, which is how we display information. Essentially, components are reusable UIs which allow you to split the app into separate blocks that act independently of each other. Components accept an arbitrary input with data (a prop) and return a React element to declare what should appear on screen. They can interact with other components via props to create a complex UI.

But to create a complex UI, you need to order the components in a logical way. To do that, we need to look at what state is in React.

3. How does REACT JS help you?

React is remarkably flexible. Once you have learned it, you can use it on a vast variety of platforms to build quality user interfaces. React is a library, NOT a framework. Its library approach has allowed React to evolve into such a remarkable tool.

React was created with a single focus: to create components for web applications. A React component can be anything in your web application like a Button, Text, Label, or Grid.

But as React's popularity is grown, its ecosystem has also grown to cover various use cases.

You just need to import the React library. Message is the component that accepts props (input) and returns JSX.

JSX is a special syntax that looks like HTML, which converts React's API calls and finally renders HTML.

Traditional frameworks like Angular and Vue power up the HTML. They use JavaScript inside HTML. They have created HTML attributes that give extra capabilities to it.

4. What are MongoDB's most important features?

MongoDB's top five technical features:

1. Ad-hoc queries for optimized, real-time analytics

When designing the schema of a database, it is impossible to know in advance all the queries that will be performed by end users. An ad hoc query is a short-lived command whose value depends on a variable. Each time an ad hoc query is executed, the result may be different, depending on the variables in question.

2. Indexing appropriately for better query executions

In our experience, the number one issue that many technical support teams fail to address with their users is indexing. Done right, indexes are intended to improve search speed and performance. A failure to properly define appropriate indices can and usually will lead to a myriad of accessibility issues, such as problems with query execution and load balancing.

3. Replication for better data availability and stability

When your data only resides in a single database, it is exposed to multiple potential points of failure, such as a server crash, service interruptions, or even good old hardware failure. Any of these events would make accessing your data nearly impossible.

Replication allows you to sidestep these vulnerabilities by deploying multiple servers for disaster recovery and backup. Horizontal scaling across multiple servers that house the same data (or shards of that same data) means greatly increased data availability and stability. Naturally, replication also helps with load balancing. When multiple users access the same data, the load can be distributed evenly across servers.

4. Sharding

When dealing with particularly large datasets, sharding—the process of splitting larger datasets across multiple distributed collections, or “shards”—helps the database distribute and better execute what might otherwise be problematic and cumbersome queries. Without sharding, scaling a growing web application with millions of daily users is nearly impossible.

5. Load balancing

At the end of the day, optimal load balancing remains one of the holy grails of large-scale database management for growing enterprise applications. Properly distributing millions of

client requests to hundreds or thousands of servers can lead to a noticeable (and much appreciated) difference in performance.

5. What is the difference between REACT JS and Angular JS?

| Field | React.js | Angular |
|--------------|---|---|
| Used as | React.js is a JavaScript library. As it indicates react js updates only the virtual DOM is present and the data flow is always in a single direction. | Angular is a framework. Angular updates the Real DOM and the data flow is ensured in the architecture in both directions. |
| Architecture | React.js is more simplified as it follows MVC ie., Model View Control. This like angular includes features such as navigation but this can be achieved only with certain libraries like Redux and Flux. Needs more configuration and integration. | The architecture of angular on the other hand is a bit complex as it follows MVVM models ie., Model View-ViewModel. This includes lots of tools and other features required for navigation, routing, and various other functionalities. |
| Performance | React.js holds JSX hence the usage of HTML codes and syntax is enabled. But this doesn't make react js a subset of HTML. This is purely JavaScript-based. | Angular, on the other, is a mere subset of HTML. |
| Preference | React.js is preferred when the dynamic content needed is intensive. As react js holds more straightforward programming and since it is reliable many apps such as Instagram, Facebook, and Twitter still prefer to react js over angular. | Angular is platform-independent and hence is compatible to work in any platform. Hence, the HTML app which is compatible with all the browsers can prefer angular. One major app which uses angular is YouTube. |
| Written | React.js written in JavaScript. | Written in Microsoft's Typescript language, which is a superset of ECMAScript 6 (ES6). |

| Field | React.js | Angular |
|----------------------|---|--|
| Dependency Injection | React.js Does not use the Dependency Injection concept. | Angular Hierarchical Dependency Injection system used. |