 **What is Node.js?**  
**Answer:** Node.js is a runtime environment that allows you to run JavaScript on the server side. It is built on Chrome's V8 JavaScript engine and is used to build scalable, high-performance web applications.

 **What is the use of Node.js?**  
**Answer:** Node.js is used for building server-side applications, APIs, real-time applications (like chat apps), and handling asynchronous events. It is especially good for I/O-heavy tasks.

 **What is the require() function in Node.js?**  
**Answer:** require() is used to import modules into your Node.js application. It allows you to include built-in modules (like fs for file system) or third-party modules.

 **What are core modules in Node.js?**  
**Answer:** Core modules in Node.js are built-in libraries that come with Node.js. Examples include http, fs, path, url, and events. You don’t need to install these—they are ready to use.

 **What is npm in Node.js?**  
**Answer:** npm (Node Package Manager) is a package manager for Node.js. It is used to install and manage libraries and dependencies in your Node.js projects.

 **What is the package.json file in Node.js?**  
**Answer:** package.json is a file that holds metadata about your Node.js project, such as its dependencies, scripts, and other configuration information.

 **What is the callback function in Node.js?**  
**Answer:** A callback function is a function passed into another function as an argument that gets executed once the operation is complete. It is commonly used in asynchronous code in Node.js.

 **What is the difference between synchronous and asynchronous in Node.js?**  
**Answer:**

* **Synchronous:** Code runs line by line, and the next line of code will not execute until the current line finishes.
* **Asynchronous:** Code runs independently without waiting for the previous line to finish, allowing the program to handle multiple tasks concurrently.
* **What is AngularJS?**  
  **Answer:** AngularJS is a JavaScript framework developed by Google to build dynamic, single-page web applications (SPAs). It extends HTML with new attributes and supports two-way data binding, dependency injection, and other features that make building complex applications easier.
* **What is two-way data binding in AngularJS?**  
  **Answer:** Two-way data binding in AngularJS means that changes in the user interface are reflected in the model (JavaScript object) and changes in the model are automatically updated in the UI. This is achieved using the ng-model directive.
* **What is a directive in AngularJS?**  
  **Answer:** A directive in AngularJS is a special marker on HTML elements or attributes that tells AngularJS to attach specific behavior or functionality to that element, such as ng-model, ng-repeat, and ng-if.
* **What are controllers in AngularJS?**  
  **Answer:** Controllers in AngularJS are JavaScript functions that are used to bind data and business logic to the views. Controllers are responsible for handling the data and functionality of a specific part of the application.
* **What is the role of ng-app in AngularJS?**  
  **Answer:** The ng-app directive is used to define the root element of an AngularJS application. It tells AngularJS where the application starts and initializes the AngularJS framework.
* **What is an AngularJS service?**  
  **Answer:** A service in AngularJS is a reusable, shareable object or function that provides specific functionality (such as data retrieval, processing, or business logic) to the controllers and other parts of the application.
* **What is dependency injection in AngularJS?**  
  **Answer:** Dependency Injection (DI) in AngularJS is a design pattern that allows AngularJS to manage the dependencies of components. It automatically injects the required dependencies into controllers, services, and other parts of the app when needed.
* **What is $scope in AngularJS?**  
  **Answer:** $scope is an object in AngularJS that acts as a bridge between the controller and the view. It allows you to pass data and functions from the controller to the HTML view and vice versa.
* **What is ng-repeat in AngularJS?**  
  **Answer:** ng-repeat is a directive in AngularJS used to repeat an HTML element for each item in an array or object. It is commonly used for displaying lists dynamically.

Example:

html

CopyEdit

<div ng-repeat="item in items">

{{ item }}

</div>

* **What is ng-model in AngularJS?**  
  **Answer:** The ng-model directive binds an HTML form element to a property in the scope object. It facilitates two-way data binding, meaning the value of the model will reflect the input field, and changes in the input field will update the model.
* **What is a view in AngularJS?**  
  **Answer:** A view in AngularJS refers to the HTML part of the application that displays the data to the user. The view is dynamically updated when the model data changes, thanks to two-way data binding.
* **What is $http in AngularJS?**  
  **Answer:** $http is a built-in AngularJS service used to make AJAX requests to a server. It allows you to send data to and receive data from a backend server using HTTP methods (GET, POST, PUT, DELETE, etc.).
* **What is a filter in AngularJS?**  
  **Answer:** A filter in AngularJS is used to format or manipulate data before displaying it in the view. Common filters include uppercase, lowercase, currency, and date.

Example:

html

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<p>{{ 12345 | currency }}</p>

* **What is an AngularJS module?**  
  **Answer:** An AngularJS module is a container for different parts of the application, such as controllers, services, filters, and directives. It helps in organizing the application and making the code reusable.
* **What is $location in AngularJS?**  
  **Answer:** $location is a service in AngularJS that allows you to get or change the URL in the browser. It can be used to navigate between different views (pages) of the application without reloading the page.
* **What is $routeProvider in AngularJS?**  
  **Answer:** $routeProvider is used to configure routes in an AngularJS application. It defines which controller and view to use for a specific route.

Example:

javascript

CopyEdit

$routeProvider.when('/home', {

templateUrl: 'home.html',

controller: 'HomeController'

});

* **What are $watch and $digest in AngularJS?**  
  **Answer:**
  + $watch: It is a function in AngularJS used to observe changes in a model or scope variable. When the variable changes, AngularJS triggers the associated function.
  + $digest: It is a function that checks all the watchers in the scope and updates the view when a change is detected.
* **What is $timeout in AngularJS?**  
  **Answer:** $timeout is a service in AngularJS that allows you to execute a function after a specified delay, similar to JavaScript's setTimeout.
* **What is the difference between ng-if and ng-show in AngularJS?**  
  **Answer:**
  + ng-if: It removes or adds the element from the DOM based on the condition. If the condition is false, the element is removed from the DOM.
  + ng-show: It hides or shows the element using CSS (display: none) based on the condition, but the element remains in the DOM.
* **What is a promise in AngularJS?**  
  **Answer:** A promise in AngularJS represents the result of an asynchronous operation. It is used to handle operations that may take some time, such as API calls. You can use .then() to handle the success or failure of the promise.
* **What is MongoDB?**  
  **Answer:** MongoDB is a NoSQL, document-oriented database that stores data in JSON-like format, called BSON (Binary JSON). It is designed for scalability, high availability, and flexibility, allowing for easy storage of unstructured or semi-structured data.
* **What is a NoSQL database?**  
  **Answer:** A NoSQL database is a type of database that does not use the traditional relational database model. It is designed for handling large volumes of unstructured or semi-structured data. MongoDB is an example of a NoSQL database.
* **What is BSON?**  
  **Answer:** BSON (Binary JSON) is a binary representation of JSON-like documents. It is used by MongoDB to store data. BSON extends JSON’s capabilities by allowing additional data types such as ObjectId, binary data, and others that JSON doesn't support.
* **What are the basic data types in MongoDB?**  
  **Answer:** Some basic data types in MongoDB are:
  + **String**: Used to store text.
  + **Integer**: Used to store integer values.
  + **Boolean**: Used for true/false values.
  + **Date**: Used to store date and time.
  + **ObjectId**: A unique identifier automatically generated for documents.
  + **Array**: Used to store an array of values.
  + **Object**: Used to store embedded documents.
* **What is a collection in MongoDB?**  
  **Answer:** A collection in MongoDB is a group of MongoDB documents. It is equivalent to a table in a relational database but does not require a predefined schema.
* **What is a document in MongoDB?**  
  **Answer:** A document in MongoDB is a record or data unit stored in a collection. It is a set of key-value pairs, similar to a row in a relational database, and is usually represented in BSON format.
* **What is the default port for MongoDB?**  
  **Answer:** The default port for MongoDB is 27017.
* **What is ObjectId in MongoDB?**  
  **Answer:** ObjectId is a special type of identifier used in MongoDB to uniquely identify documents. It is 12 bytes long and is generated by MongoDB by default for each document in a collection.
* **How do you connect to a MongoDB database?**  
  **Answer:** You can connect to a MongoDB database using the Mongo shell or a driver like Mongoose in Node.js. For example, in the Mongo shell:

bash

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mongo <database-name>

* **What is a primary key in MongoDB?**  
  **Answer:** In MongoDB, the primary key is the unique identifier for a document. By default, MongoDB uses the \_id field as the primary key, which is unique for each document in the collection.
* **How do you insert data into a MongoDB collection?**  
  **Answer:** You can insert data using the insertOne() or insertMany() methods. Example:

javascript

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db.collection('users').insertOne({ name: "John", age: 30 });

* **How do you query data in MongoDB?**  
  **Answer:** You can query data using the find() method. Example:

javascript

CopyEdit

db.collection('users').find({ name: "John" });

* **What is the difference between find() and findOne() in MongoDB?**  
  **Answer:**
  + **find()**: Returns a cursor to all documents that match the query. It can return multiple documents.
  + **findOne()**: Returns only the first document that matches the query.
* **What is an index in MongoDB?**  
  **Answer:** An index in MongoDB is used to improve the performance of queries. Indexes are created on fields that are frequently queried, which helps to speed up the search process.
* **How do you update data in MongoDB?**  
  **Answer:** You can update data using the updateOne(), updateMany(), or replaceOne() methods. Example:

javascript

CopyEdit

db.collection('users').updateOne({ name: "John" }, { $set: { age: 31 } });

* **What is the $set operator in MongoDB?**  
  **Answer:** The $set operator in MongoDB is used to update the value of a field in a document. If the field doesn’t exist, it will be added.
* **What is the $push operator in MongoDB?**  
  **Answer:** The $push operator in MongoDB is used to add an element to an array field. If the field does not exist, it will be created as an array.
* **How do you delete data in MongoDB?**  
  **Answer:** You can delete data using the deleteOne() or deleteMany() methods. Example:

javascript

CopyEdit

db.collection('users').deleteOne({ name: "John" });

* **What is aggregation in MongoDB?**  
  **Answer:** Aggregation in MongoDB refers to processing data and transforming it into meaningful results, such as grouping, sorting, and filtering. The aggregation framework allows you to perform operations like group, sort, match, etc.
* **What is a replica set in MongoDB?**  
  **Answer:** A replica set in MongoDB is a group of MongoDB servers that maintain the same data set, ensuring high availability and data redundancy. One server is the primary, while the others are secondary nodes.

 **What is MySQL?**  
**Answer:** MySQL is an open-source relational database management system (RDBMS) that uses SQL (Structured Query Language) for managing and manipulating data. It is widely used for storing and retrieving data in web applications and other systems.

 **What is a relational database?**  
**Answer:** A relational database is a type of database that stores data in tables with rows and columns, where each table is related to other tables through keys. MySQL is an example of a relational database management system (RDBMS).

 **What is SQL?**  
**Answer:** SQL (Structured Query Language) is a standard language used to manage and manipulate relational databases. It is used for querying, updating, inserting, and deleting data from databases.

 **What is a table in MySQL?**  
**Answer:** A table in MySQL is a collection of data organized in rows and columns. It is the primary structure used to store data in a database.

 **What are the different types of keys in MySQL?**  
**Answer:**

* **Primary Key**: A field or combination of fields that uniquely identifies each record in a table.
* **Foreign Key**: A field that links one table to another, establishing a relationship between them.
* **Unique Key**: A constraint that ensures all values in a column are unique.
* **Index**: A performance optimization tool that speeds up the retrieval of rows.

 **What is the difference between CHAR and VARCHAR in MySQL?**  
**Answer:**

* **CHAR**: A fixed-length string data type. If the data is shorter than the defined length, it is padded with spaces.
* **VARCHAR**: A variable-length string data type. It stores data exactly as it is, without padding.

 **How do you create a database in MySQL?**  
**Answer:** You can create a database using the following SQL query:

sql

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CREATE DATABASE database\_name;

 **What is a primary key in MySQL?**  
**Answer:** A primary key is a field or combination of fields that uniquely identifies each record in a table. A table can have only one primary key.

 **What is a foreign key in MySQL?**  
**Answer:** A foreign key is a field in one table that refers to the primary key in another table. It establishes a relationship between the two tables, enforcing referential integrity.

 **What is an index in MySQL?**  
**Answer:** An index is used to speed up the retrieval of rows from a table. It can be created on one or more columns of a table, and it improves the performance of SELECT queries.

 **How do you insert data into a table in MySQL?**  
**Answer:** You can insert data using the INSERT INTO statement:

sql

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INSERT INTO table\_name (column1, column2) VALUES (value1, value2);

 **How do you retrieve data from a table in MySQL?**  
**Answer:** You can retrieve data using the SELECT statement:

sql

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SELECT \* FROM table\_name;

 **What is the WHERE clause in SQL?**  
**Answer:** The WHERE clause is used to filter records based on a condition. It is used in SQL queries to specify which rows to retrieve, update, or delete.

Example:

sql

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SELECT \* FROM users WHERE age > 30;

 **How do you update data in MySQL?**  
**Answer:** You can update data using the UPDATE statement:

sql

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UPDATE table\_name SET column\_name = value WHERE condition;

 **How do you delete data from a table in MySQL?**  
**Answer:** You can delete data using the DELETE statement:

sql

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DELETE FROM table\_name WHERE condition;

 **What is the GROUP BY clause in SQL?**  
**Answer:** The GROUP BY clause groups rows that have the same values in specified columns into summary rows, such as finding the count, sum, or average.

Example:

sql

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SELECT department, COUNT(\*) FROM employees GROUP BY department;

 **What is the HAVING clause in SQL?**  
**Answer:** The HAVING clause is used to filter records after they have been grouped by the GROUP BY clause. It is similar to the WHERE clause but used for aggregated data.

Example:

sql

CopyEdit

SELECT department, COUNT(\*) FROM employees GROUP BY department HAVING COUNT(\*) > 5;

 **What is a join in MySQL?**  
**Answer:** A join in MySQL is used to combine rows from two or more tables based on a related column. Common types of joins include:

* **INNER JOIN**: Returns rows that have matching values in both tables.
* **LEFT JOIN (or LEFT OUTER JOIN)**: Returns all rows from the left table and matching rows from the right table.
* **RIGHT JOIN (or RIGHT OUTER JOIN)**: Returns all rows from the right table and matching rows from the left table.

Example:

sql

CopyEdit

SELECT employees.name, departments.name

FROM employees

INNER JOIN departments ON employees.department\_id = departments.id;

 **What is normalization in MySQL?**  
**Answer:** Normalization is the process of organizing the data in a database to reduce redundancy and dependency by dividing large tables into smaller ones and linking them using relationships. The goal is to improve data integrity.

 **What is a NULL value in MySQL?**  
**Answer:** A NULL value in MySQL represents a missing or undefined value. It is different from an empty

 **What is ReactJS?**  
**Answer:** ReactJS is a JavaScript library developed by Facebook for building user interfaces, especially for single-page applications. It allows you to create reusable UI components and efficiently update the UI when data changes.

 **What are components in ReactJS?**  
**Answer:** Components are the building blocks of a React application. They can be either **functional components** (written as JavaScript functions) or **class components** (written as JavaScript classes). Components allow you to break down the UI into smaller, reusable pieces.

 **What is JSX in React?**  
**Answer:** JSX (JavaScript XML) is a syntax extension for JavaScript that looks similar to HTML. It allows you to write HTML-like code inside JavaScript, which React then converts into real HTML. JSX makes it easier to build user interfaces in React.

 **What is the difference between state and props in React?**  
**Answer:**

* **State**: It is used to store data that can change over time within a component. State is local to a component and can be modified using setState().
* **Props**: They are used to pass data from a parent component to a child component. Props are immutable (cannot be changed by the child component).

 **What is a "Virtual DOM" in React?**  
**Answer:** The Virtual DOM is an in-memory representation of the actual DOM. React uses it to efficiently update the real DOM by first making changes to the virtual DOM and then applying the minimal number of changes to the real DOM. This makes the app faster.

 **What is a functional component in React?**  
**Answer:** A functional component is a JavaScript function that returns JSX. It receives props as an argument and is used to render UI. With the introduction of hooks, functional components can now also manage state and lifecycle events.

 **What are React Hooks?**  
**Answer:** React Hooks are functions that allow you to use state and lifecycle features in functional components. Some common hooks include:

* useState(): Manages state in a functional component.
* useEffect(): Manages side effects (like data fetching or subscriptions).
* useContext(): Accesses the context in a functional component.