

Experiment 8 : To study Angular JS

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Aim: To study AngularJS

Problem Statement:

- Demonstrate with an AngularJS code one way data binding and two way data binding in AngularJS
- Implement a basic authentication system for a web application using AngularJS. Create a simple login page that takes a username and password, and upon submission, checks for a hardcoded set of credentials. If the credentials are valid, display a success message; otherwise, show an error message. Demonstrate AngularJS controller, module and form directives.
- Users want to search for books by title, author, or genre. To accomplish this, develop an AngularJS custom filter named bookFilter and include it into the application.
- Create a reusable and modular custom AngularJS service to handle user authentication. Include this service into an application.

Theory:-

1. What are directives? Name some of the most commonly used directives in AngularJS application

Directives are one of the core features of AngularJS that allow developers to extend HTML functionality. They are special markers on DOM elements (such as attributes, elements, or CSS classes) that tell AngularJS to attach specific behaviors to those elements or transform them.

Commonly Used Directives in AngularJS:

1. ng-app: Defines the root element of an AngularJS application.
2. ng-model: Binds the value of an input, select, or textarea to a variable.
3. ng-bind: Replaces the content of an HTML element with the value of an expression.
4. ng-repeat: Iterates over an array or collection to generate repeated elements.
5. ng-if: Conditionally includes or removes elements from the DOM.
6. ng-show / ng-hide: Shows or hides an element based on a Boolean expression.
7. ng-click: Binds a click event to a function in the controller.

2. What is data binding in AngularJS?

Data binding is the process of synchronizing data between the model and the view. AngularJS supports two types of data binding:

One-way Data Binding: The model updates the view, but changes in the view do not affect the model. Example:

```
<span ng-bind="message"></span>
```

Two-way Data Binding: The model and view are linked such that changes in one reflect in the other. Example:

```
<input type="text" ng-model="username">  
<p>Hello, {{username}}!</p>
```

Two-way data binding is one of AngularJS's most powerful features, reducing the need for manual DOM manipulation.³

3. How is form validation done in AngularJS?

Form validation in AngularJS ensures that user input is correct before submission. AngularJS provides built-in directives for form validation:

1. ng-required: Ensures that an input field is mandatory.
2. ng-minlength / ng-maxlength: Sets minimum and maximum character limits for input fields.

3. ng-pattern: Validates input based on a regular expression pattern.
4. ng-disabled: Disables a form element based on an expression.

Example:

```
<form name="userForm">
  <input type="email" name="email" ng-model="userEmail" ng-
required="true">
  <span ng-show="userForm.email.$error.required">Email is required.</span>
</form>
```

AngularJS tracks form states such as \$pristine, \$dirty, \$valid, and \$invalid to provide real-time validation feedback.

4. What is the use of AngularJS Controllers in the application?

AngularJS controllers are JavaScript functions used to define application logic and manage the flow of data between the view and the model. Controllers are attached to the DOM using the ng-controller directive.

Key Functions of Controllers:

1. Define scope variables: Controllers bind data to the view using the \$scope object.
2. Handle business logic: Controllers process user input and manipulate the model accordingly.
3. Communicate with services: They fetch data from APIs or services.

Example:

```
app.controller('MainController', function($scope) {
  $scope.message = "Welcome to AngularJS!";
});
```

In the view:

```
<div ng-controller="MainController">
  <p>{{ message }}</p>
</div>
```

Controllers improve the maintainability of AngularJS applications by separating concerns.

5. What is the use of AngularJS Filters in the application?

Filters in AngularJS modify data before displaying it in the view. They can be used within expressions and directives like `ng-repeat`.

Commonly Used Filters:

1. uppercase / lowercase: Converts text to upper or lower case.
2. currency: Formats numbers as currency.
3. date: Formats date values.
4. filter: Filters an array based on a specified condition.
5. orderBy: Sorts an array by a specified property.

Example:

```
<p>{{ "hello world" | uppercase }}</p>
```

```
<p>{{ 1000 | currency }}</p>
```

```
<p>{{ myDate | date:'short' }}</p>
```

Filters enhance the readability of data and improve user experience.

Github: <https://github.com/MahvishLS/webxLab/tree/master/Lab8>

Output:

One-Way & Two-Way Data Binding Demo

Welcome to Book Finder

Data Binding Demo

One-Way Binding: SIDDIQUI MAHVISH D15A 56

Two-Way Binding:

You typed: Hey..Mahvish

Login Page

Login

Login

Book Finder Page

Search Books

Search by title, author, or genre

The Great Gatsby
Author: F. Scott Fitzgerald
Genre: Fiction

1984
Author: George Orwell
Genre: Dystopian

To Kill a Mockingbird
Author: Harper Lee
Genre: Classic

Moby-Dick
Author: Herman Melville
Genre: Adventure

Pride and Prejudice
Author: Jane Austen
Genre: Romance

War and Peace
Author: Leo Tolstoy
Genre: Historical

The Catcher in the Rye
Author: J.D. Salinger
Genre: Coming-of-Age

The Hobbit
Author: J.R.R. Tolkien
Genre: Fantasy

Brave New World
Author: Aldous Huxley
Genre: Science Fiction

Conclusion:

In this experiment, key concepts and features of AngularJS were explored through practical implementation. We successfully demonstrated one-way and two-way data binding, showing how data flows between the model and the view in different contexts. A basic authentication system was developed using a controller and form directives to manage user inputs and feedback, providing real-time validation and response based on hardcoded credentials.

We also created a custom filter (bookFilter) that enables users to search books by title, author, or genre, showcasing AngularJS's powerful filtering capabilities in enhancing user experience. To promote modularity and code reusability, a custom AngularJS service was implemented to handle authentication logic, keeping business logic separate from UI components.

