📘 Angular Application – Complete Training Notes

Module 1: Introduction to Angular & CLI

1. What is Angular?

Angular is a frontend framework used to build dynamic, scalable, and single-page web applications.

It is based on:

- TypeScript
- Component-based architecture
- Modular development

---

2. What is Angular CLI?

CLI = Command Line Interface

Angular CLI is a tool that helps developers create, manage, and build Angular applications easily.

Why We Use Angular CLI?

- Create Angular project
- Generate components
- Generate services
- Generate modules
- Run development server
- Build production application
- Run unit tests

Important CLI Commands

Create Angular App:

ng new my-app

Run Application:

ng serve

Generate Component:

ng g c component-name

Build for Production:

ng build

Module 2: Angular Project Structure

After creating the project, important folder structure:

```
src
 └── app
     ├── app.component.ts
     ├── app.component.html
     ├── app.component.css
```

File Explanation

app.component.ts
→ Contains business logic

app.component.html
→ Contains UI structure

app.component.css
→ Contains styling

app.component.spec.ts
→ Contains unit testing logic

Module 3: Component Concept in Angular

What is a Component?

A component represents a part of UI.

Examples:

- Header
- Navbar
- Main Section
- Footer
- Product Card
- Sidebar

Angular applications are built using multiple components.

Why We Use Components?

- Code Reusability
- Easy Maintenance
- Easy Debugging
- Easy Testing
- Scalable Architecture
- Better Code Organization

Module 4: How to Create Component

Command:

ng g c header
ng g c main
ng g c footer

Angular creates:

- header.component.ts
- header.component.html
- header.component.css
- header.component.spec.ts

Rendering Components Inside App Component

Inside app.component.html:

<app-header></app-header>
<app-main></app-main>
<app-footer></app-footer>

Module 5: Angular Application Flow

index.html
↓
app.component.html
↓
Header + Main + Footer

index.html contains:

<app-root></app-root>

Angular loads entire application inside app-root.

Module 6: Dividing Application into Multiple Components

Home Page Structure

Home Page is a collection of multiple components:

- Nav Component
- Ad Component
- Trending Products Component
- Footer Component

Component Hierarchy

App Component
→ Home Component
    → Nav Component
    → Ad Component
    → Trending Products
    → Footer

Module 7: TypeScript Basics

JavaScript Example

```
var city = "Hyderabad"
let age = 25
const pi = 3.14
```

Problems in JavaScript

- Loosely typed
- Runtime errors
- Hard to manage large applications

What is TypeScript?

TypeScript is a strongly typed programming language.

JavaScript is loosely typed.

TypeScript is a superset of JavaScript.

That means:
All JavaScript features + Additional features.

TypeScript Example

let title: string = "Angular"
let pincode: number = 12345
let isActive: boolean = true

Module 8: JavaScript vs TypeScript

JavaScript:

- Loosely typed
- Errors at runtime
- Less scalable

TypeScript:

- Strongly typed
- Errors at compile time
- More scalable
- Best for large applications

Module 9: CSS Grid Layout Basics

Grid Terminology

- Grid Container
- Grid Items
- Rows
- Columns
- Grid Lines
- Grid-row
- Grid-column

Basic Grid Example

```
.container {
  display: grid;
  grid-template-columns: repeat(4, 1fr);
  gap: 10px;
}
```

Layout Examples

1. Four Cards in One Row

```
grid-template-columns: repeat(4, 1fr);
```

2. Two Column Layout

```
grid-template-columns: 2fr 1fr;
```

3. Product Grid Layout

```
grid-template-columns: repeat(3, 1fr);
```

Session Summary

We learned:

- How to create Angular application
- What is Angular CLI
- Component concept
- Why components are important
- How to divide application into multiple components
- TypeScript basics
- JavaScript vs TypeScript
- CSS Grid fundamentals
- Angular application architecture

🎯 Interview Questions – Angular

🔹 Fresher Level (5 Questions)

1. What is Angular?

Angular is a frontend framework used to build single-page applications using TypeScript and component-based architecture.

---

2. What is a Component in Angular?

A component is a building block of Angular application. It controls a part of the UI.

---

3. What is Angular CLI?

Angular CLI is a command-line tool used to create, manage, and build Angular applications.

---

4. What is TypeScript?

TypeScript is a strongly typed superset of JavaScript that adds type safety and compile-time checking.

---

5. Difference Between JavaScript and TypeScript?

JavaScript:

- Loosely typed
- Runtime errors

TypeScript:

- Strongly typed
- Compile-time errors

🔹 Experienced Level (5 Questions)

1. Explain Component Lifecycle in Angular.

Angular components go through lifecycle hooks such as:

- ngOnInit
- ngOnChanges
- ngOnDestroy
  These hooks allow execution of logic at different stages.

---

2. What is the difference between One-way and Two-way Data Binding?

One-way binding:
Data flows from component to view.

Two-way binding:
Data flows both from component to view and view to component using [(ngModel)].

---

3. What is the role of index.html in Angular?

index.html is the main HTML file that loads the Angular application using selector.

---

4. How do you structure a large Angular application?

By dividing into:

- Feature modules
- Shared modules
- Core modules
- Reusable components
- Services

---

5. Why is TypeScript important in Angular?

Because Angular is built using TypeScript and it provides:

- Type safety
- Better maintainability
- Early error detection
- Scalability
