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Angular training

Learn the most powerful Web Framework on the market!

3 days (21 hours)

Presentation

Dive into the world of the modern Web with our "Angular - Web Application Development" course, designed to meet the needs of developers wishing to master Angular and its latest developments. By the end of this course, you'll have a thorough understanding of Angular's key concepts and latest technical developments.

Learn how to develop a complete web application with JavaScript and TypeScript, mastering state management and advanced navigation with routes.

This course also focuses on the creation of reusable and modular components, thanks to the optimal use of Angular decorators and the Shadow DOM.

You'll also cover the essentials of testing and security: learn how to write effective unit tests with Jasmine and Karma, and protect your applications against common attacks such as XSS and CSRF.

Finally, discover and adopt Angular development best practices, including performance optimization, advanced change management, and the use of modern tools like ESLint and Prettier to ensure clear, maintainable and high-performance code.

In short, you'll discover new features and best practices for building modern applications. From component architecture to advanced data management with RxJS, we'll cover all the essential stages of Angular development.

Our program is based on the latest version of Angular, Angular 20, and includes the new features brought by TypeScript 5.8 and ES2024.

Objectives

- Discover the new features of the Angular framework
- How to develop a new Web application with Angular
- Designing Angular applications with JavaScript and TypeScript
- Using unit and functional testing in development
- Discover the latest version of the official ES2024 JavaScript specification
- Understanding the Framework's advanced mechanisms

Target audience

- Web Developer
- Lead Developer
- Web Architect

Prerequisites

- Knowledge of JavaScript or TypeScript, HTML5/CSS3
- Test My Knowledge

Software requirements

- Minimum 8 GB ram (16 GB recommended) on Windows 10, macOS or Linux (Ubuntu type)
- A proxy-free Internet connection
- Nodejs installed
- An installed IDE such as Visual Studio Code

Recommendations for pre- and post-course reading

- If you're not 100% comfortable with Angular components, we suggest this article from Malcoded
- An Angular guide to mastering modules
- To find out more, discover the best development practices for Angular
- A long, detailed article on the use of routers
- A long tutorial in English to master the forms

Angular 20 training program

Introduction & fundamentals

- ES2024: the new JavaScript
  - New features: Records/Tuples, pipeline operator, async context, pattern matching
  - Practical workshop: refactoring an ES5 script to ES2024 in five iterations

- ES2024 and modules
  - Dynamic import/export, top-level await, private scopes
  - Practical workshop: dynamically loading a module to display a feature flag
- TypeScript: typing JavaScript
  - Advanced types: unions, intersections, template-literal-types, inference
  - Decorators and light metaprogramming
- Practical workshop: convert previous script to TypeScript, configure tsconfig strict.

Framework basics

- Angular philosophy: MVVM architecture, hierarchical dependency injection
- Templating: line directives, interpolation, DOM security
- Angular CLI: essential commands, custom generators, Nx basics
- Practical workshop: setting up the environment, generating a first application, setting up linting and continuous formatting (Prettier + ESLint).

Component

- Web Components & Shadow DOM encapsulation
- Angular decorators : @Component, @Input, @Output, @Signal
- Data binding
- Lifecycle with signals
- Practical workshop: Creating a reusable component (user card)+ Jasmine/Karma unit testing.

Guidelines

- Structural guidelines and attributes: ngIf, ngFor, ngSwitch, ngClass, ngStyle
- How it works, hooks, DI in a directive
- Attribute vs Structural directives
- Complex guidelines
- Practical workshop: Write an appHighlight directive with configurable parameters and publish it via a Standalone Component.

Pipes

- Supplied transformers
- Formatting a channel
- Formatting collections
- Using a pipe as a service
- Practical workshop: Creating your own pipes.

Modules & Lazy Loading

- Angular modules: forRoot, forChild, provide*()

- Providers of a module, provide*() API
- Imports/Exports, scopes, Lazy-loading
- Patterns forRoot / forChild
- Practical workshop: create a "Products" Feature module, export it and then integrate it into the root app with lazy-loading.

Services

- Services provided (HttpClient, Location, Title...)
- Practical workshop: Instrumentation of the HttpClient service with a logging interceptor.

Dependency injection (IOC)

- Dependency solvers: type-based & injection tokens
- Providers: value, factory, class, existing
- Practical workshop: Create a configurable logger with token injection and inject it hierarchically.

Router

- Route configuration, guards, resolvers, dynamic lazy-loading
- URLs, redirects, typed parameters (routerLinkActiveOptions)
- Nested views, named outlets, router-animations
- Practical workshop: transforming the previous application into a multi-feature SPA, protecting a route with a JWT authentication guard.

Testing & Security

- TDD principles: Jasmine, Karma, Vitest
- Integration testing with TestBed + Harnesses
- Security: XSS, CSRF, Content Security Policy, Angular DomSanitizer
- Practical workshop: write a component test with Harness+ HTTP mock, fix an XSS flaw reported by ESLint-plugin-security.

Observables: Responsiveness with RxJS & Signals

- Observables, RxJS operators, differences with Promises
- New concepts: signal, effect, linkedSignal
- RxJS basics, marble diagrams
- Creation, transformation and combination operators
- Practical workshop: Implementing an auto-completion search Observable with undo.

Exchange with a server

- HTTP requests: interceptors, retries, exponential back-off
- API REST & GraphQL (Angular Apollo)
- Customer status management: SignalStore, ComponentStore, NgRx SignalStore adapter
- Practical workshop: consume a remote REST API, store data in a signal store, display via AsyncPipe.

Form

- Template-driven vs Reactive Forms
- Native & custom validators; Async Validators
- Error handling, ControlStatus and signalEffect
- Practical workshop: create a responsive order form, cross-field validation+ POST mock-up.

Performance & Optimization

- Change detection: Default, OnPush, zoneless strategies (preview)
- ChangeDetection : Default vs OnPush, signX autopush
- Strategy compilation: JIT, AOT, SSR hydration
- Lazy-loading images, defer blocks, progressive hydration
- Incremental hydration, delayed loading, @defer guidelines
- Practical workshop: Profiling with Angular DevTools, correcting an overloaded component.

Companies concerned

This course is aimed at both individuals and companies, large or small, wishing to train their teams in a new advanced computer technology, or to acquire specific business knowledge or modern methods.

Positioning on entry to training

Positioning at the start of training complies with Qualiopi quality criteria. As soon as registration is finalized, the learner receives a self-assessment questionnaire which enables us to assess his or her estimated level of proficiency in different types of technology, as well as his or her expectations and personal objectives for the training to come, within the limits imposed by the selected format. This questionnaire also enables us to anticipate any connection or security difficulties within the company (intra-company or virtual classroom) which could be problematic for the follow-up and smooth running of the training session.

Teaching methods

Practical course: 60% Practical, 40% Theory. Training material distributed in digital format to all participants.

Organization

The course alternates theoretical input from the trainer, supported by examples, with brainstorming sessions and group work.

Validation

At the end of the session, a multiple-choice questionnaire verifies the correct acquisition of skills.

Sanction

A certificate will be issued to each trainee who completes the course.