# Struktura angular-a

## Single page app vs multiple-page application

SPA is fast, as most resources (HTML+CSS+Scripts) are only loaded once throughout the lifespan of application and rendered trough javascript client(client side rendering). Only data is transmitted back and forth. Lak razvoj I debug aplikacije. Mana je teska SEO optimizacija zato sto je strana koju ucitavamo na backendu prazna , google na primer ne moze da pretrazi sadrzaj nase strane jer se sadrzaj dodaje naknadno pomocu JS-a.

Kod MPA(Server side rendering) na backendu postoji ruta za svaku stranicu(staticki html sa javascript kodom)

## pros and cons of Angular compared to React?

React je biblioteka a angular razvojno okruzenje.

Angular dolazi sa preinstaliranim feature-ima kao sto su RXjS, rutiranje, animacije, dependency injection...

Angular se zasnima na MVC(model,view,controler) arhitekturi, a React na Komponentama za koje koristi JSX(JavaScript XML, allows us to write HTML in React).

React ima bolje SEO u odnosu na angular zbog SSR(Server side rendering)-a.

Angular koristu two-way data binding can affect performance, as it constantly checks for changes in both the model and the view.

React’s one-way data binding and the use of a virtual DOM contribute to better performance, as it only updates the parts of the DOM that have changed.

A comparison of a model binding

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## Struktura Angular Projekta

U root folderu se nalaze svi konfiguracioni fajlovi za typescript, biblioteke i angular.

Unutar src foldera se nalaze globalni css fajl, glavni html fajl , main.ts fajl i app folder.

Main.ts je prvi fajl koji se izvrsava.

U app folderu se nalazi root componenta

## Module

Modul predstavlja kolekciju komponenti,servisa,pipe-ova...

AppModule je glavni root module.

Od angulara 17 se ne kreira automatski vec je postao opciona stavka. Ovo je postignuto pomocu standallone komponenti

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**Declarations:** Lista deklarisanih komponenata unutar modula. U Koliko pokusamo da koristimo komponentu bez da je prethodno deklarisemo docice od greske.

**Imports:** sluzi da importujemo druge module koji su nam potrebni za rad aplikacije

**Providers:** koristi se za dependecy injection.

**Bootstrap:** the root component that Angular creates and inserts into the index.html host web page.

### What is ForRoot & ForChild in Angular?

ForRoot je staticna funkcija unutar modula koja se koristi za dodavanje konfiguracije i servisa unutar modula. Dobar primer je dodavanje ruta u RoutingModulu. Ova funkcija je depricated i sada se koristi @Injectable({providedIn: 'root'}) dekorator.

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Primer custom forRoot-a u custom modulu

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In Angular, the forChild method is used to define child routes within a module.

## Komponente

Osnovni blok gradnje u angular-u.

Kreira se pomocu komande ng new c NazivKomponente.

Komponenta se sastoji od Dekoratora i ts klase. Dekorator u sebi sadrzi metapodatke kao sto su:

-selector : naziv komponente u html-u

-template: html komponente

-styleUrl: css komponente

-providers: lista provider-a za ovu komponentu i njenu decu

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### Component vs Directive - what is the difference?

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Component directive su komponente koje u sebi sadrze template odnosno izgled elementa.

Atribute directive se koristi za menjanje izgleda ili ponasanja DOM elemenata. ngStyle ngClass

Strukturne direktive se koriste za prikazivanje/skrivanje dom ele. ngIf ngFor

### Standalone komponente

Omogucavaju nam da definisemo komponente bez upotrebe modula. Ako zelimo da standalone komponentu koristimo u drugoj standalone komponenti potrebno je da je importujemo kod dekoratora komponente.

### Lifecycle

Kada angular aplikacija zapocne sa radom ona prvo renderuje root komponent-u. Zatim renderuje njegovu decu pa decu od dece.

Zivotni ciklus komponentes se moze pratiti uz pomoc sledecih metoda:

* ngOnInit: kada se prvi put inicijalizuje
* ngOnChanges: kada se izvrsi event koji rezultira promenom DOM-a(input,httpreq)
* ngOnDestroy: kada se komponenta brise
* ngAfterOnInit: kada komponenta zavrsi sa renderovanjem

### Sharing data between components in Angular

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### Constructor vs NgOnInit in Angular

Konstruktor se prvi poziva i ngOnInit se poziva kada se konstruktor zavrsi.

## Hierarchical Injection

A diagram of components

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Ako komponenti C dodelimo(providers[]) neki element ista instanca tog elementa ce biti dostupna i u komponentama c1 i c2.

Ako koristimo provider u child komponentama onda ce one sve tri komponente imati razlicite instance.

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Ako se instanca dependency-a ne nadje kad se stigne do root componente onda se prelazi na pretrazivanje unutar module injector-a. U koliko se ni tu ne pronadje odgovarajuca instanca onda se baca greska.

A diagram of a diagram

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## ViewChild and ViewChildren in Angular?

Dekoratori koji se koriste za pristupanje DOM elementima kao i metodama i propetiima child komponenata.

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## Difference between ng-template, ng-container, and ng-content

<**ng**-**template**> is a **template** element that **Angular** uses with structural directives ( \*ngIf, \*ngFor, [ngSwitch], and custom directives). Ng-templeate se ne renderuje u koliko se ne pozove pomocu direktiva.

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**ng-container** is an extremely simple directive that allows you to group elements in a template that doesn’t interfere with styles or layout because Angular doesn’t put it in the DOM

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Ng-content se koristi za injectovanje html-a iz parenta u child komponentu.

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ngTemplateOutlet is an Angular directive that allows you to dynamically render a template within a component's content. It allows you to pass in a template as input to a component, which can be used to render the content of the component in a customized way.

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## JIT and AOT

Angular provides two compilation techniques, AOT(Ahead of Time) and JIT(Just-in-Time)

AOT je server side rendering, za produkciju

JIT client side rendering, best when your application is in local development

## Data Binding in Angular

String binding {{}}

Property [src]=““

Event (click)=“onClick()“

TwoWay binding [(ngModel)]=““

## Pipe

Koriste se za transformaciju podataka

{{ promenljiva | async}} async pipe primer, prednost je sto se automatsku unsubscibe-uje kad se komponenta izbrise.

## Routing

Izvrsava se u routing modulu. Svaka ruta ima svoju putanju,komponentu,decuRute,guardOvi,Provideri

## Difference between ngif and hidden

ngIf ne redneruje komponentu a hidden renderuje

## DOM

Document Object Model (DOM) is the object-oriented representation of an HTML or XML document.

Omogucava js da pristupi nekom elementu.

## Bubling

Event Bubbling is a concept in the DOM (Document Object Model). It happens when an element receives an event, and that event bubbles up (or you can say is transmitted or propagated) to its parent and ancestor elements in the DOM tree until it gets to the root element.A screenshot of a computer

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# Zone.js

Zone.js je biblioteka koju angular koristi za change detection mehanizam. Zone.js handluje asinhrone dogadjaje kao sto su:

* DOM events (click, hover over, etc.)
* AJAX requests
* Timers (setTimer(), setInterval())

If any of these events occur in your Angular app, Zone.js will cause change detection to run.

## ngZone in Angular?

Omogucava nam da pokrenemo kod izvan angular change detection-a. Ovime se problem sa optimizacijom. Primer dole.

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