Angular

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What is Angular?

- Angular is a JavaScript client side framework for creating powerful web or mobile applications
- Created and maintained by Google
- The most popular JavaScript framework as of date
- Create HTML-like elements (components)
  - a combination of HTML, CSS and JavaScript

What is Angular?

- Complete re-write of AngularJS
- Component based
- No controllers or scope
- Streamlined dependency injection
- Can write apps in TypeScript, Dart or JavaScript (ES5/ES6)

What is Angular?

- SPA (Single Page Application)
    - Just one file - index.html,
        - components rendered dynamically
- Cleaner code

What is Angular?

- So many options
  - ES5
  - CoffeeScript
  - DART
  - ES6 and ES7
  - TypeScript

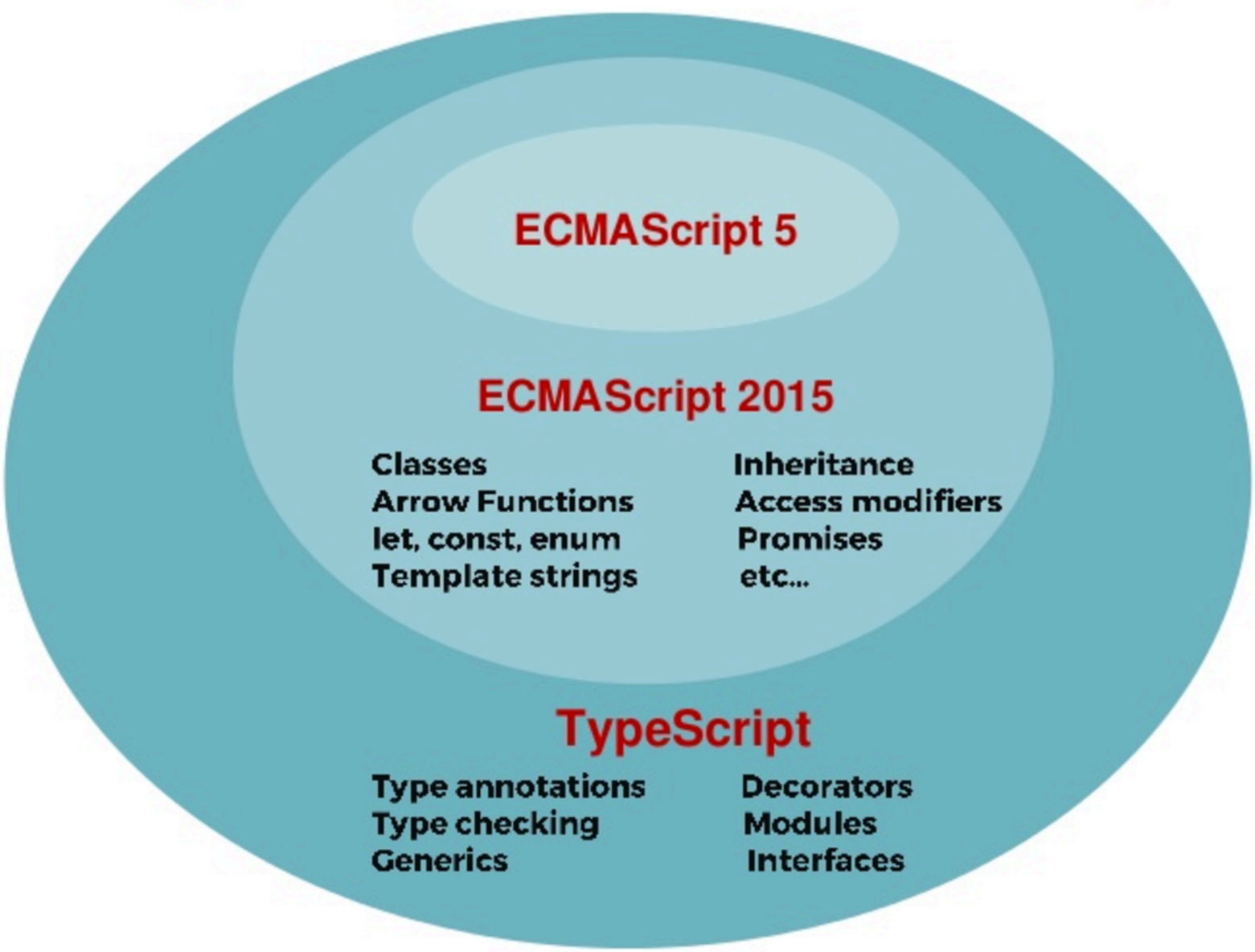
What is Angular?

- Modular
- Testable
- Maintainable

JavaScript advances

- ES6 (ES2015)
  - Classes
  - Modules
  - Decorators
- TypeScript
  - ES6 and ES7
  - Strong typing
  - Interfaces

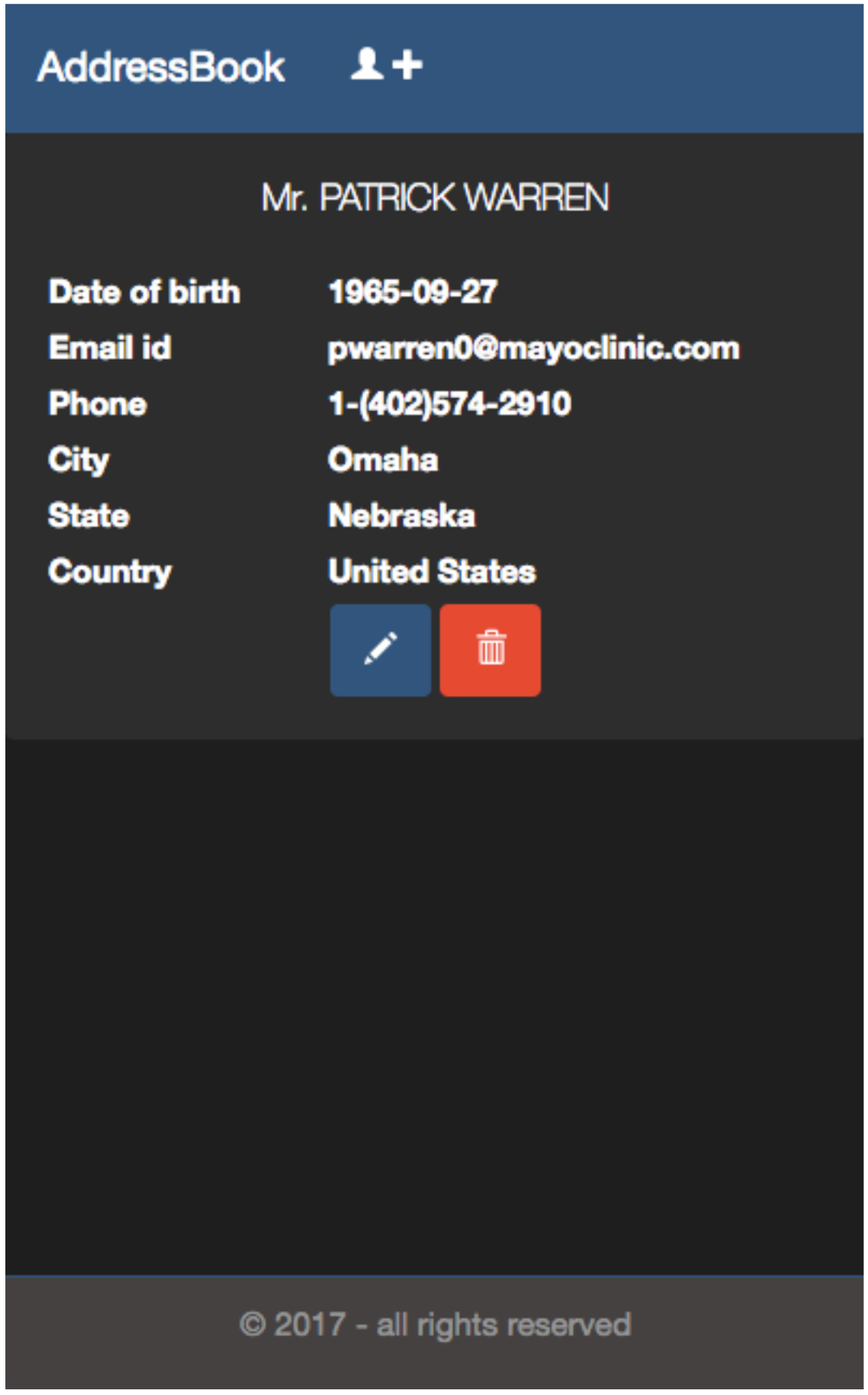
TypeScript = All JavaScripts



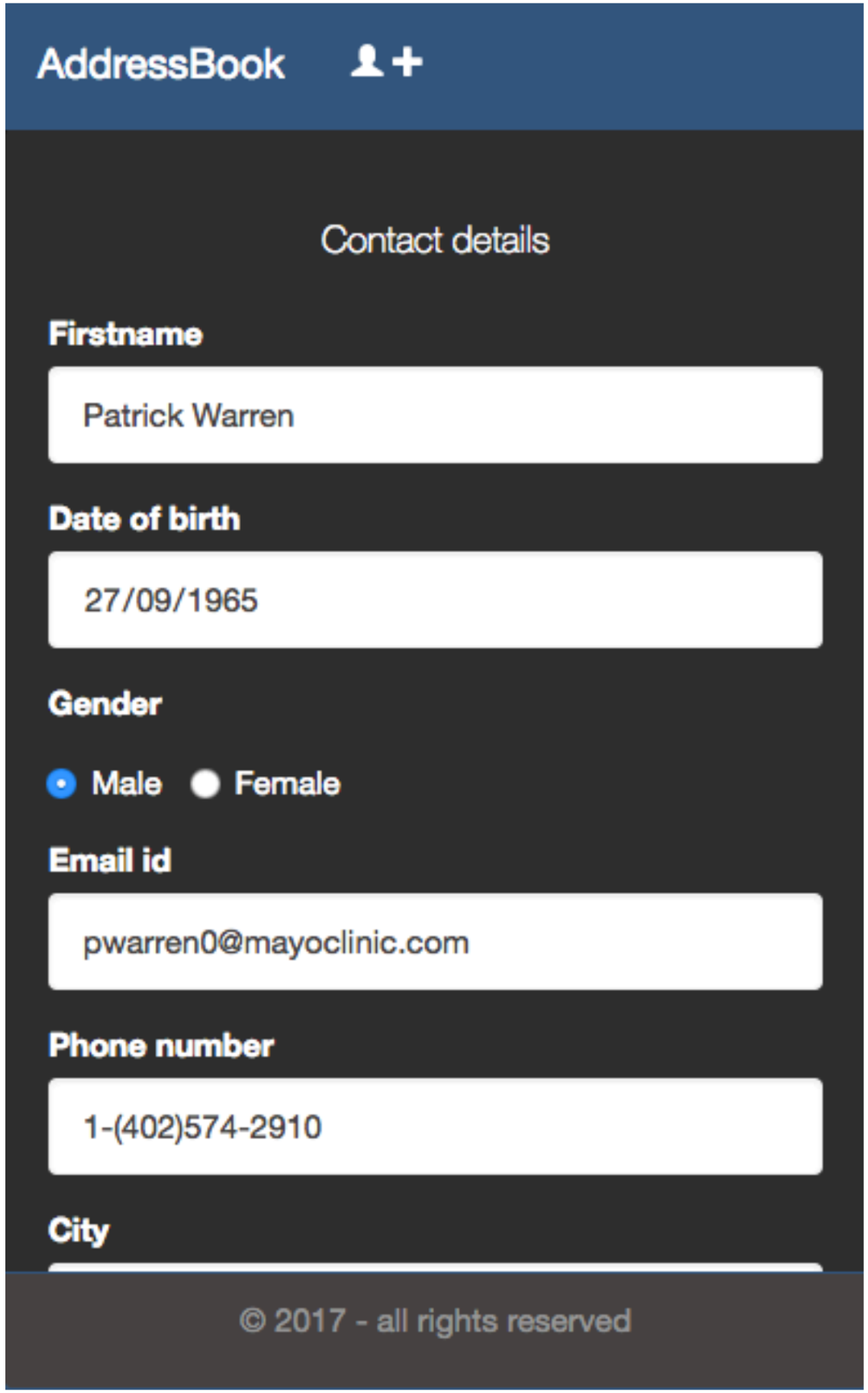
Angular main concepts

- Module
- Component
- Template
- Data binding
- Metadata
- Service
- Directive
- Dependency injection

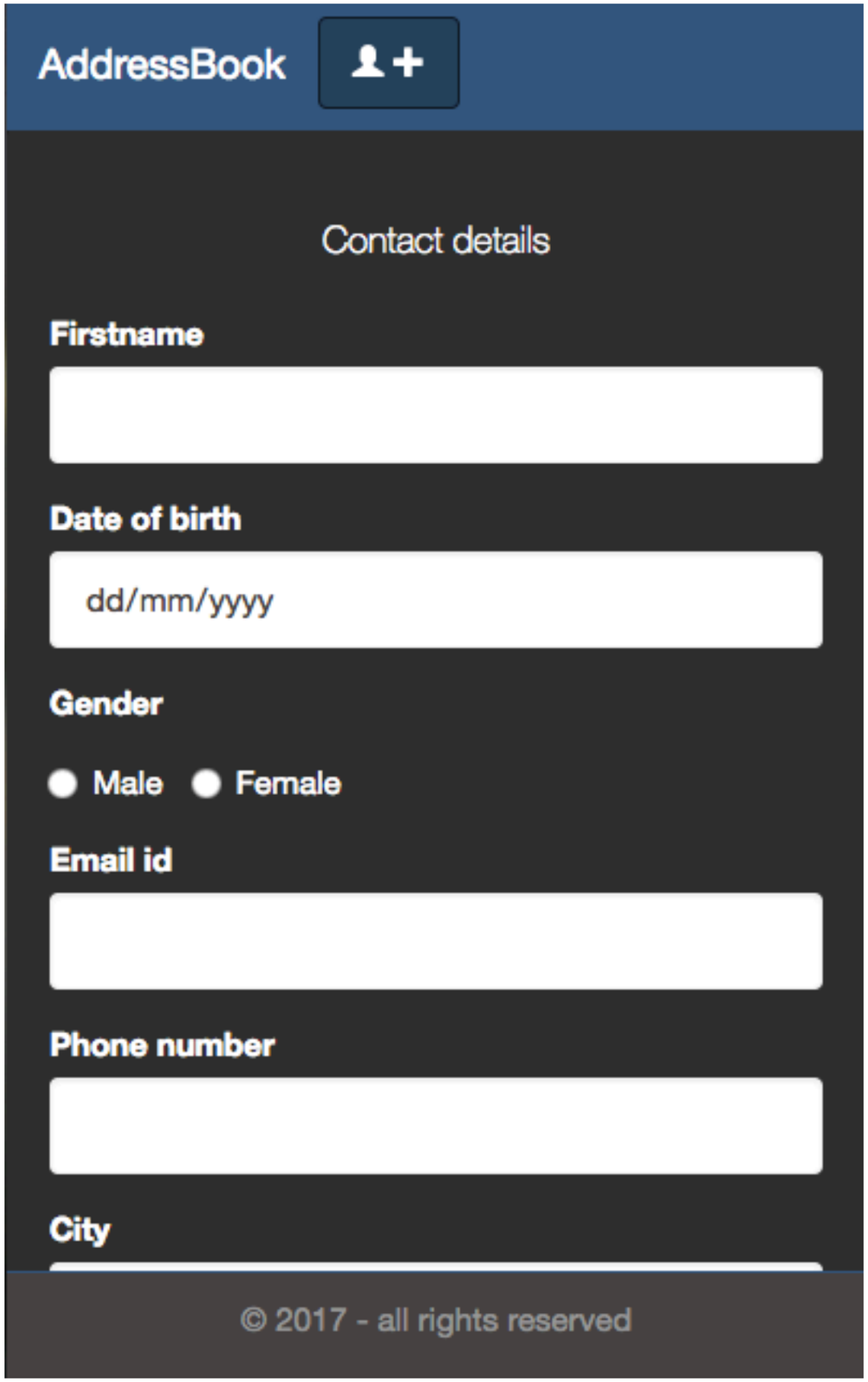
The App we are going to build



The App we are going to build



The App we are going to build

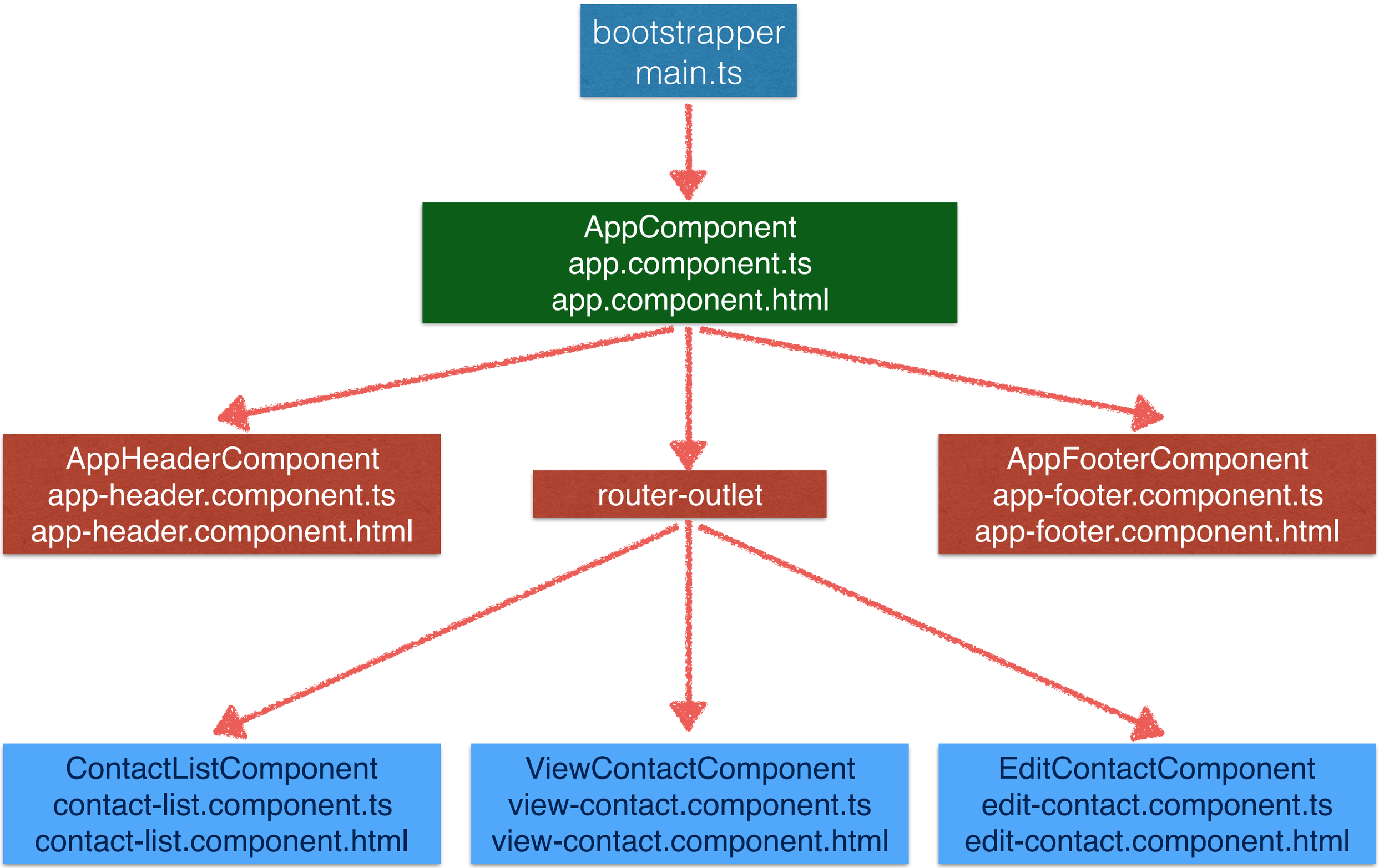


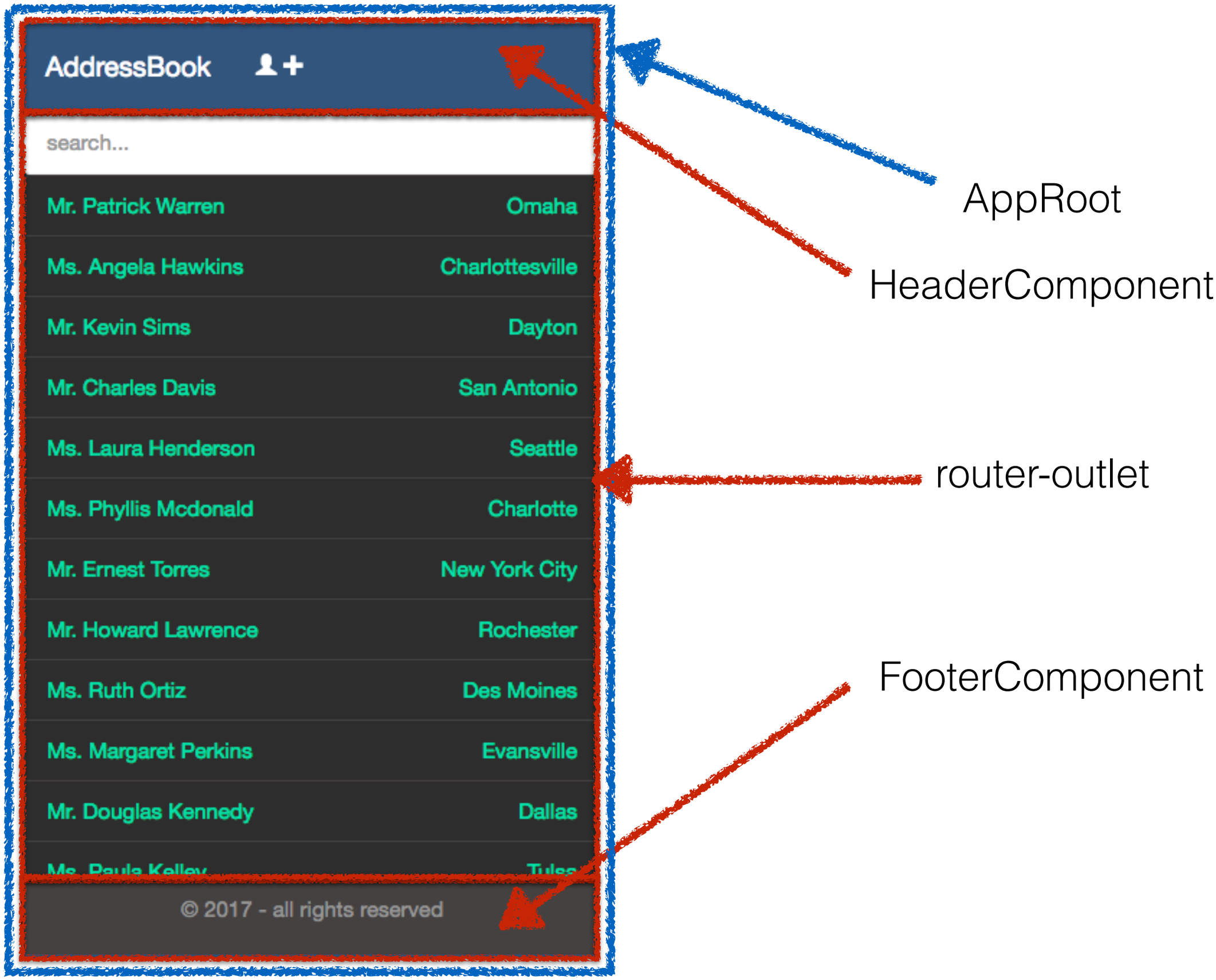
The App we are going to build

Component

- @Component makes a class a reusable component
- A component is a combination of data, functions, and HTML
- Data —> state
- Function —> behaviour
- HTML —> view

An app is a tree of components




AddressBook
search...
Mr. Patrick Warren
Omaha
Ms. Angela Hawkins
Charlottesville
Mr. Kevin Sims
Dayton
Mr. Charles Davis
San Antonio
Ms. Laura Henderson
Seattle
Ms. Phyllis Mcdonald
Charlotte
Mr. Ernest Torres
New York City
Mr. Howard Lawrence
Rochester
Ms. Ruth Ortiz
Des Moines
Ms. Margaret Perkins
Evansville
Mr. Douglas Kennedy
Dallas
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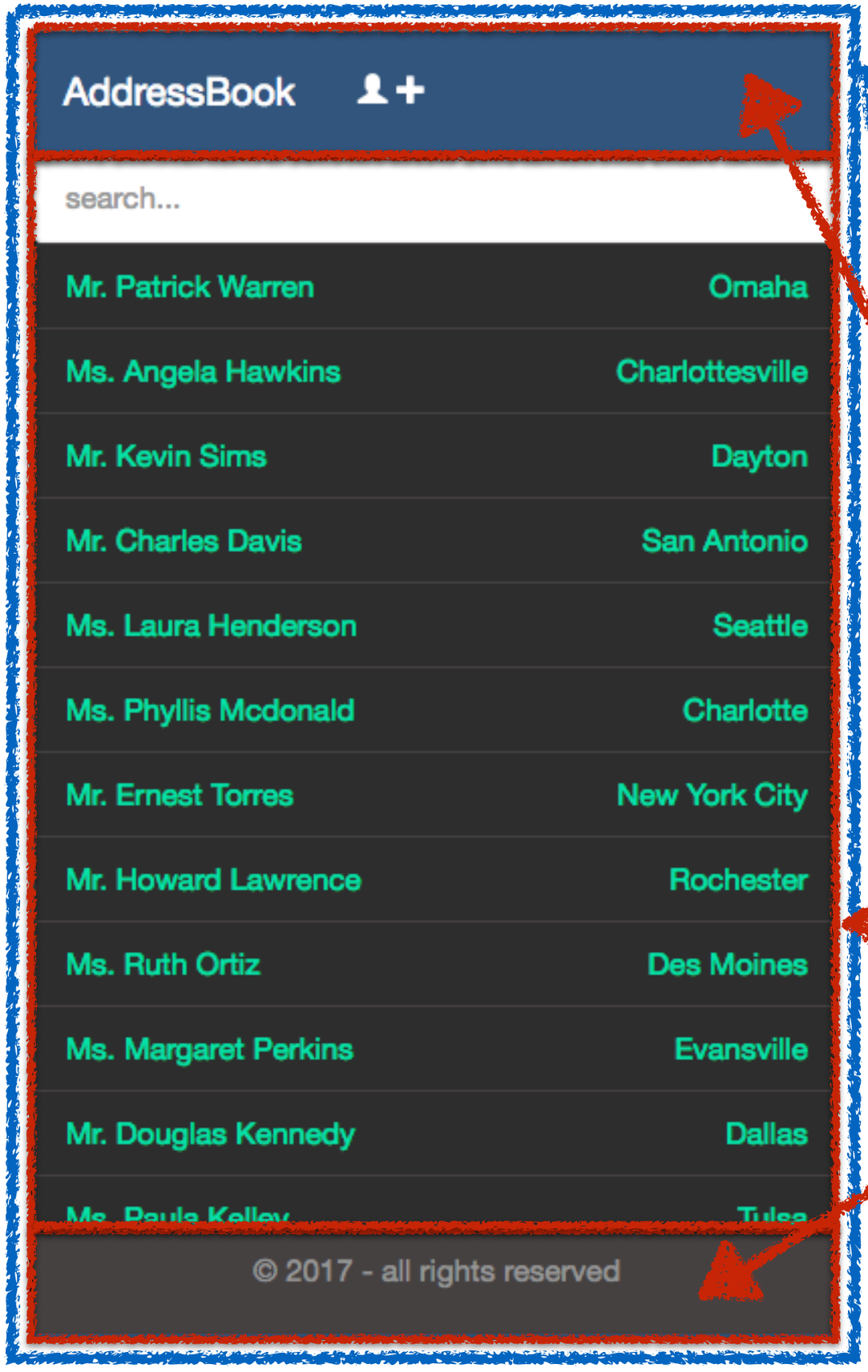
AppRoot
HeaderComponent
router-outlet
FooterComponent

An app is a tree of components



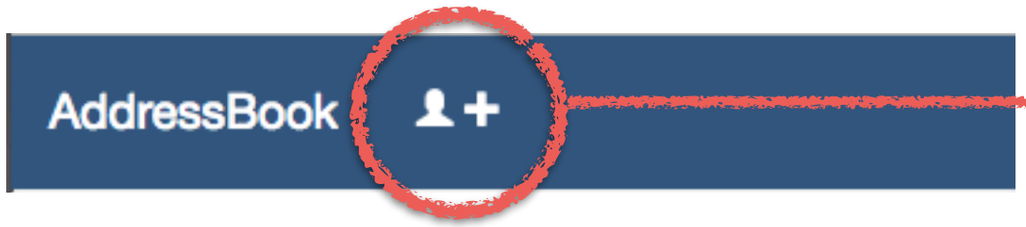

```
<!DOCTYPE html>
<html>
<head>
    <title>ng2addressbook</title>
</head>
<body>
    <app-root></app-root>
</body>
</html>
```

```
<app-header></app-header>
<div class="container" style="margin
  <router-outlet></router-outlet>
</div>
<app-footer></app-footer>
```

Metadata

- Metadata is extra information which gives angular more info
- @Component tells angular that the class is a component
- @Directive tells angular that the class is a directive
- @Injectable, @RouteConfig, @NgModule, …

AppHeaderComponent




```
<div class="navbar navbar-default navbar-fixed-top">
  <div class="container">
    <div class="navbar-header">
      <a href="" [routerLink]="['']" class="navbar-brand">
        AddressBook</a>
      <a href="" class="btn btn-primary navbar-btn"
        href="" [routerLink]="['add-contact']"
        title="Add a new contact">
        <i class="glyphicon glyphicon-user"></i>
        <i class="glyphicon glyphicon-plus"></i>
      </a>
    </div>
  </div>
</div>
```

Importing resource from module

Decorator

```
import { Component } from '@angular/core';

@Component({
    selector: 'app-header',
    templateUrl: "../templates/app-header.component.html",
})
export class AppHeaderComponent{

    constructor() {
    }
}
```

Component's state and behaviour defined here

Template

- Is a way to describe a view using HTML
- Templates can be included with the component
- Or as an external file reference
- Best practice is to use an HTML file

Template

Data for the template (state)

```
@Component({
    selector: "edit-contact",
    templateUrl: "../templates/contact-form.com
})
export class EditContactComponent {

    contact: Contact = new Contact();
```

```
<div class="well">
    <p class="lead text-center">
        {{contact.gender | title}} {{contact.name|u
    </p>
    <div class="row">
        <label class="col-xs-4">Date of birth</labe
        <label class="col-xs-8">{{contact.dob}}</la
    </div>
    <div class="row">
        <label class="col-xs-4">Email id</label>
        <label class="col-xs-8">{{contact.email}}</
    </div>
    <div class="row">
        <label class="col-xs-4">Phone</label>
        <label class="col-xs-8">{{contact.phone}}</
    </div>
    <div class="row">
        <label class="col-xs-4">City</label>
        <label class="col-xs-8">{{contact.city}}</l
    </div>
    <div class="row">
        <label class="col-xs-4">State</label>
        <label class="col-xs-8">{{contact.state}}</
    </div>
    <div class="row">
        <label class="col-xs-4">Country</label>
        <label class="col-xs-8">{{contact.country}}
    </div>
    <div class="row">
        <div class="col-xs-12 text-center">
            <a href="" [routerLink]="['/edit-contac
                <span class="glyphicon glyphicon-pe
            </a>
            <a href="javascript:void(0)" class="btn
                (click)="deleteContact()">
                <span class="glyphicon glyphicon-tr
            </a>
        </div>
    </div>
```

Databinding

- {{ value }} —> interpolation
- [property] = “value” —> property binding
- (event) = “handler” —> event binding
- [(ngModel)] = “property” <—> two way binding

Service

- “Substitutable objects that are wired together using dependency injection (DI)”
- Used to share code across an application
- Lazily initialised

Directives

- A class with @Directive metadata
- Two kinds: attributes and structural
  - Attribute directives alter the look or behaviour of an existing element
  - Structural directives alter the layout by adding, removing, and/or replacing elements in the DOM
  - ***A Component is a directive with a view***

Dependency injection

- A way to supply a new instance of a class with the fully-formed dependencies it needs

- Most dependencies are services

- Angular knows which service/s a component depend on by looking at the types of it's constructor parameters

- Services are injected by an ***injector*** which uses a ***Provider*** to create the service

Dependency Injection

injecting an instance of Http (service)

```
@Injectable()
export default class ContactService {

    private url:string = "http://localhost:1234/contacts";

    constructor(private http: Http){
    }
```

injecting an instance of ContactService

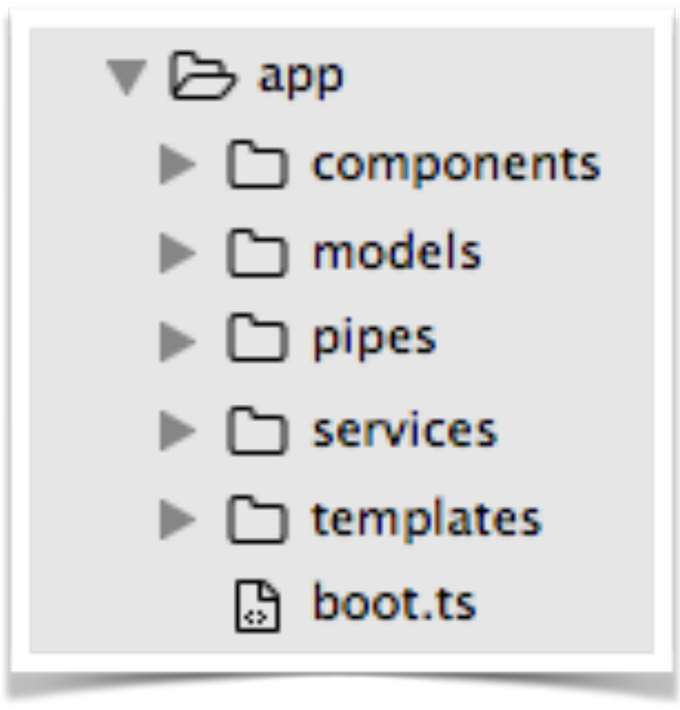
```
export class AddContactComponent {

    contact: Contact = new Contact();

    constructor(private cs: ContactService){
    }
```

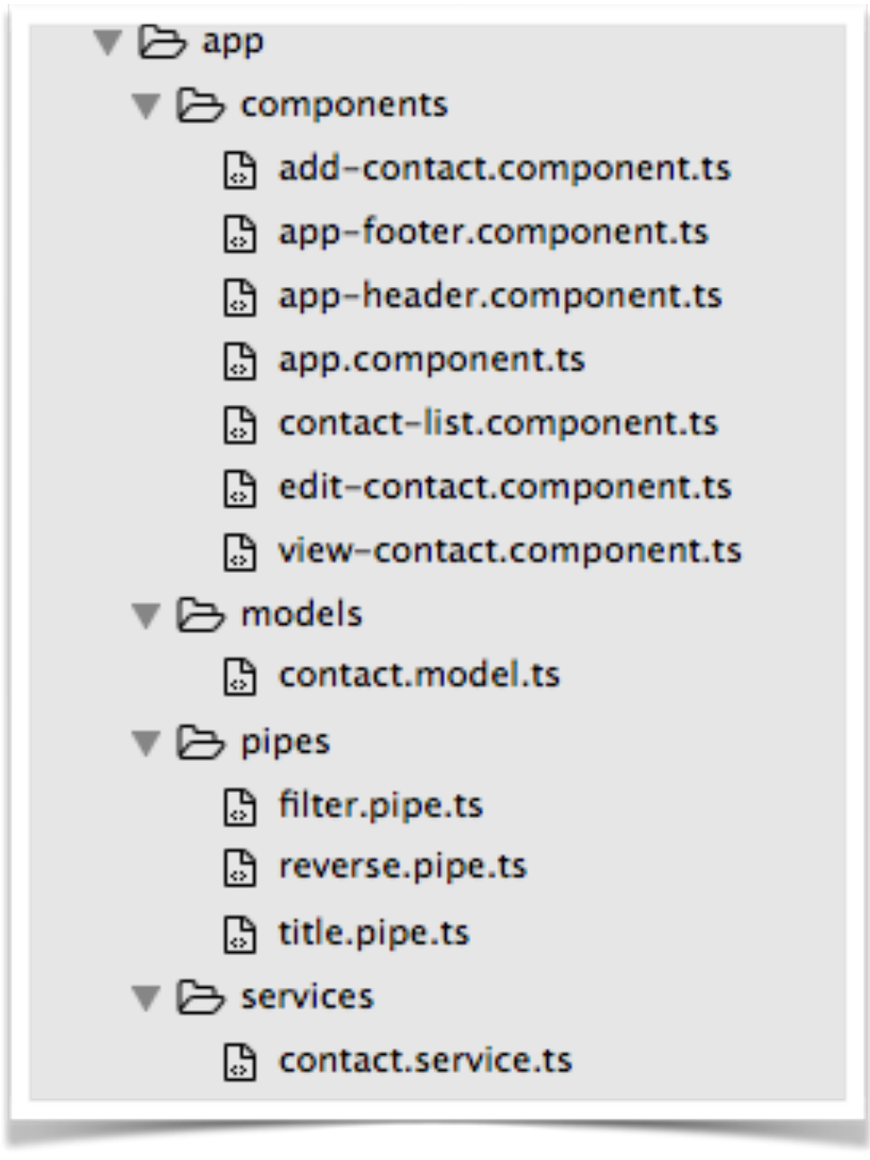
Module

- Modules are optional, but a best practice
- export tells TypeScript that the resource is a module available for other modules
- import tells TypeScript which resource to import from a module
- Angular comes with a collection of library modules

Module

…is basically a
Script file in a folder.





Exporting a resource in a module…

```
export class Contact {
    public id: number;
    public name: string;
    public dob: Date;
    public gender: string;
    public email: string;
    public phone: string;
    public city: string;
    public state: string;
    public country: string;
}
```

Importing a resource from a module…

```
import { Contact } from "../models/contact.model";

@Component({
    selector: "contact-list",
    templateUrl: "../templates/contact-list.component.html",
})
export class ContactListComponent {

    contacts: Array<Contact> = [];
    selectedContact: Contact;
    token: string="";
```

Using router

- Four things to take care of:

    1. Import RouterModule, Routes from @angular/router
    2. Define the route config using RouterModule.forRoot()
    3. Use routerLink on hyperlinks or buttons
    4. Create a <router-outlet> to dynamically place a component

1. Import…

```
import { RouterModule, Routes }   from '@angular/router';
```

2. Define routes

```
RouterModule.forRoot([
    {
        path: "", redirectTo: "/contact-list", pathMatch: "full"
    },
    {
        path: "contact-list", component: ContactListComponent
    },
    {
        path: "add-contact", component: AddContactComponent
    },
    {
        path: "view-contact/:id", component: ViewContactComponent
    }
], {
    useHash: true
}),
```

3. Links…

```
<li>
    <a href="" [routerLink]="['contact-list']">Home</a>
</li>
<li>
    <a href="" [routerLink]="['add-contact']">Add new contact</a>
</li>
```

```
<a href="javascript:void(0)"
    [routerLink]="['/view-contact', c.id]"
    class="list-group-item"
    *ngFor="let c of contacts">

    <span>
        {{c.gender=="Male"?"Mr.":"Ms"}} {{c.firstname}} {{c.lastname}}
    </span>
    <span class="pull-right">{{c.city}}</span>

</a>
```

4. Router outlet

```
<div class="container" style="margin-top: 60px; padding: 0;">
    <router-outlet></router-outlet>
</div>
```

Navigating via code

```
1  import { Component } from "@angular/core";
2  import ContactService from "../services/contact.service";
3  import { Contact } from "../models/contact.model";
4  import { Router } from "@angular/router";
5
6  @Component({
7      selector: "contact-list",
8      templateUrl: "../templates/contact-list.component.html",
9  })
10 export class ContactListComponent {
11
12     contacts: Array<Contact> = [];
13     selectedContact: Contact;
14
15     constructor(private cs: ContactService, private router: Router){
16         cs.getAll().then(data=>{
17             this.contacts=data;
18         })
19         .catch(resp=>{
20             console.error(resp);
21         });
22         console.log(`There are ${this.contacts.length} contacts`);
23     }
24
25     viewContact(id: number): void {
26         this.router.navigate(['/view-contact', id]);
27     }
28
29 }
```

Reading router parameters

```
1  import { Component, Input, OnInit } from "@angular/core";
2  import { Contact } from "../models/contact.model";
3  import ContactService from "../services/contact.service";
4  import { ActivatedRoute, Params, Router } from "@angular/router";
5  import "rxjs/add/operator/switchMap";
6
7  @Component({
8      selector: "view-contact",
9      templateUrl: "../templates/view-contact.component.html",
10 })
11 export class ViewContactComponent implements OnInit {
12
13     contact: Contact = new Contact();
14
15     constructor(private cs: ContactService,
16         private route: ActivatedRoute,
17         private router: Router){
18     }
19
20     ngOnInit(){
21         this.route.params
22             .subscribe(params => {
23                 this.cs.getContact(+params["id"])
24                     .then(contact=>{
25                         this.contact = contact;
26                     })
27             });
28     }
29
```

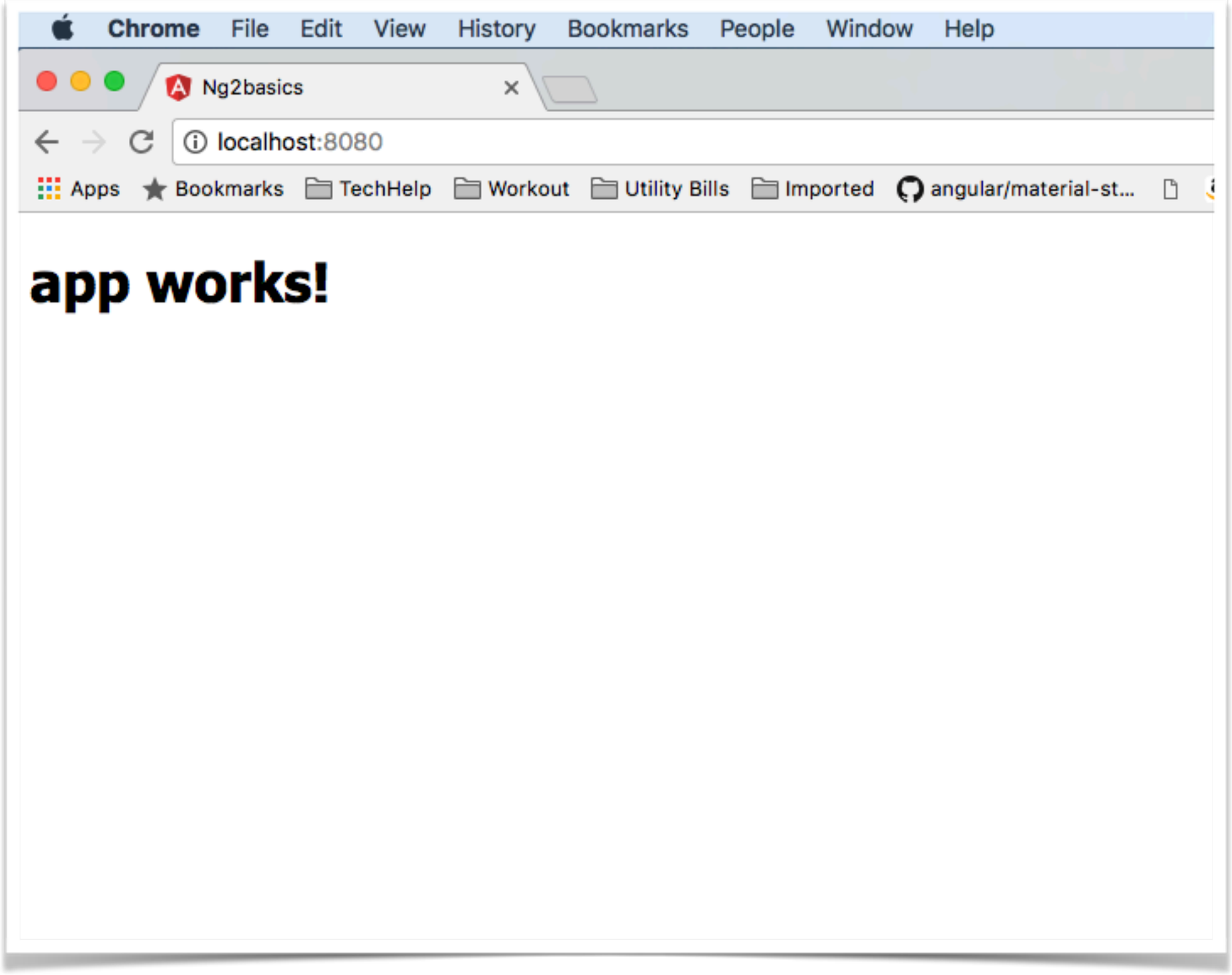
Setup

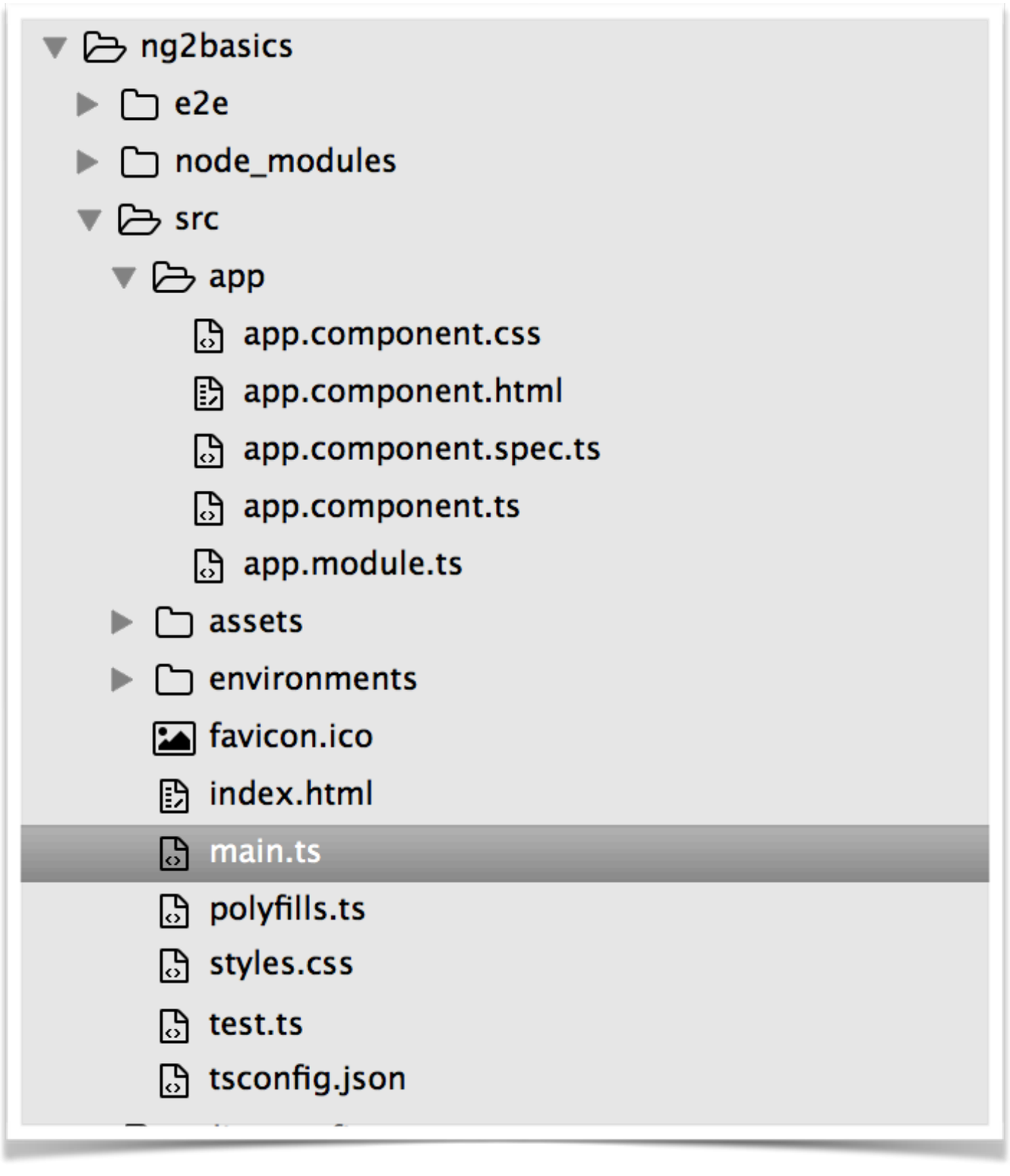
- Create a work directory and init angular-cli
- Type the command :
  - ng new angular-demo-app
    - It takes a long time to finish, have patience

Run

- cd in to the app directory
- Run the app
  - ng serve --port 8080 -o

```
Vinods-MacBook-Pro:ng2basics vinodkumar$ ng serve --port 8080
fallbackLoader option has been deprecated - replace with "fallback"
loader option has been deprecated - replace with "use"
fallbackLoader option has been deprecated - replace with "fallback"
loader option has been deprecated - replace with "use"
fallbackLoader option has been deprecated - replace with "fallback"
loader option has been deprecated - replace with "use"
fallbackLoader option has been deprecated - replace with "fallback"
loader option has been deprecated - replace with "use"
** NG Live Development Server is running on http://localhost:8080. **
Hash: 5837e716cf7e47276058
Time: 8565ms
chunk    {0} main.bundle.js, main.bundle.map (main) 4.59 kB {2} [initial] [rendere
chunk    {1} styles.bundle.js, styles.bundle.map (styles) 9.96 kB {3} [initial] [r
chunk    {2} vendor.bundle.js, vendor.bundle.map (vendor) 2.84 MB [initial] [rende
chunk    {3} inline.bundle.js, inline.bundle.map (inline) 0 bytes [entry] [rendere
webpack: Compiled successfully.
```


Chrome File Edit View History Bookmarks People Window Help
Ng2basics
localhost:8080
Apps Bookmarks TechHelp Workout Utility Bills Imported angular/material-st...
app works!


ng2basics
e2e
node_modules
src
app
app.component.css
app.component.html
app.component.spec.ts
app.component.ts
app.module.ts
assets
environments
favicon.ico
index.html
main.ts
polyfills.ts
styles.css
test.ts
tsconfig.json

main.ts

main.ts

```
1  import './polyfills.ts';
2
3  import { platformBrowserDynamic } from '@angular/platform-browser-dynamic';
4  import { enableProdMode } from '@angular/core';
5  import { environment } from './environments/environment';
6  import { AppModule } from './app/app.module';
7
8  if (environment.production) {
9    enableProdMode();
10 }
11
12 platformBrowserDynamic().bootstrapModule(AppModule);
13
```

src/app.module.ts

app.module.ts

```
1  import { BrowserModule } from '@angular/platform-browser';
2  import { NgModule } from '@angular/core';
3  import { FormsModule } from '@angular/forms';
4  import { HttpModule } from '@angular/http';
5
6  import { AppComponent } from './app.component';
7
8  @NgModule({
9    declarations: [
10     AppComponent
11   ],
12   imports: [
13     BrowserModule,
14     FormsModule,
15     HttpModule
16   ],
17   providers: [],
18   bootstrap: [AppComponent]
19 })
20 export class AppModule { }
21
```

src/index.html

src/app/app.component.html

app.component.html

```
1  <h1>
2    {{title}}
3  </h1>
4
```

index.html

```
1  <!doctype html>
2  <html>
3  <head>
4    <meta charset="utf-8">
5    <title>Ng2basics</title>
6    <base href="/">
7
8    <meta name="viewport" content="width=
9    <link rel="icon" type="image/x-icon"
10 </head>
11 <body>
12   <app-root>Loading...</app-root>
13 </body>
14 </html>
```

app.component.ts

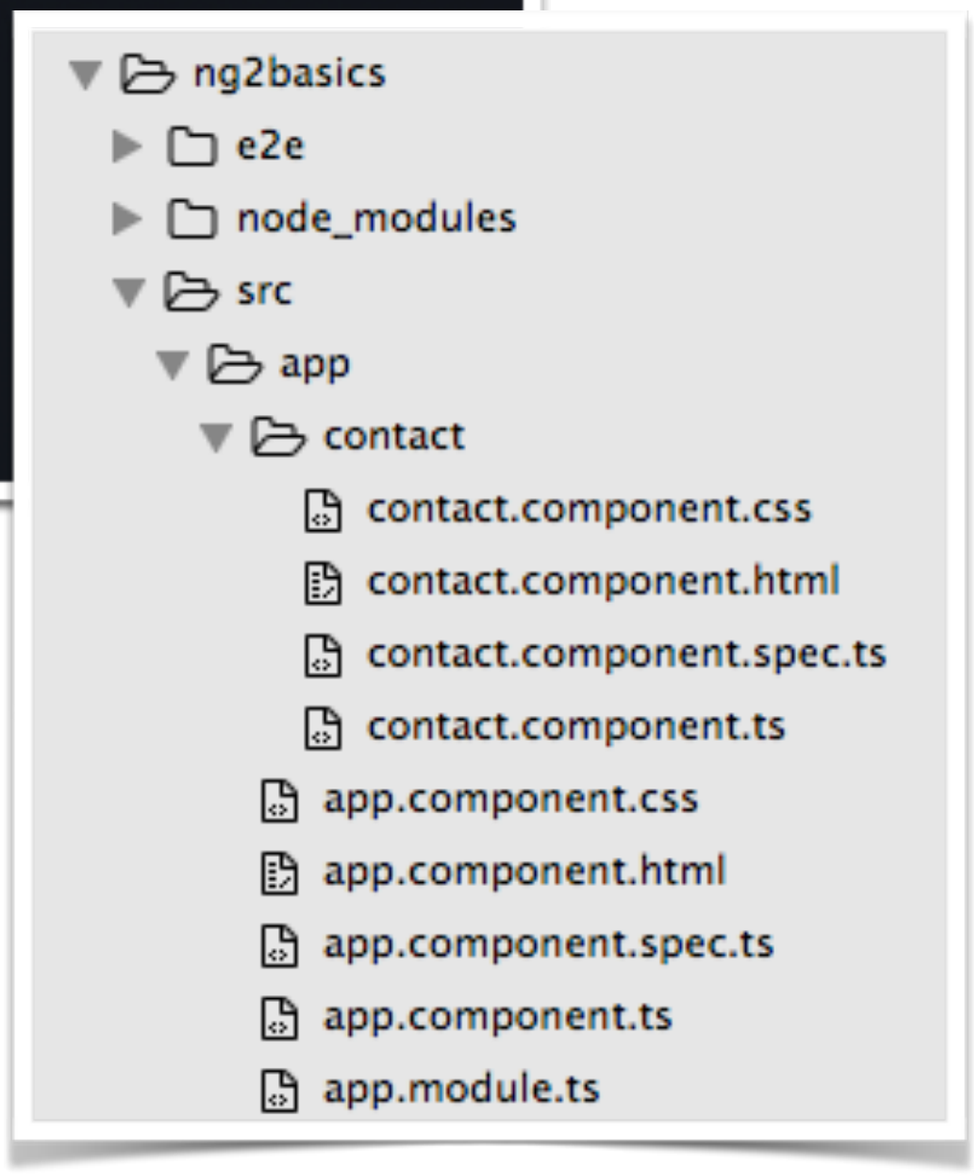
```
1  import { Component } from '@angular/core';
2
3  @Component({
4    selector: 'app-root',
5    templateUrl: './app.component.html',
6    styleUrls: ['./app.component.css']
7  })
8  export class AppComponent {
9    title = 'app works!';
10 }
```

src/app/app.component.ts

Adding a new component:

ng generate component <Component-Name>

```
Vinods-MacBook-Pro:ng2basics vinodkumar$ ng generate component Contact
installing component
  create src/app/contact/contact.component.css
  create src/app/contact/contact.component.html
  create src/app/contact/contact.component.spec.ts
  create src/app/contact/contact.component.ts
  update src/app/app.module.ts
Vinods-MacBook-Pro:ng2basics vinodkumar$
```



More options

- Generate components:
  - ng generate component components/counter
  - ng g c components/counter
- Generate service (injectables):
  - ng g s services/contacts
- Generate directives:
  - ng g d directives/box
- Generate pipes:
  - ng g p pipes/fullname

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- SkillShare: https://skl.sh/2JfpU2I

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