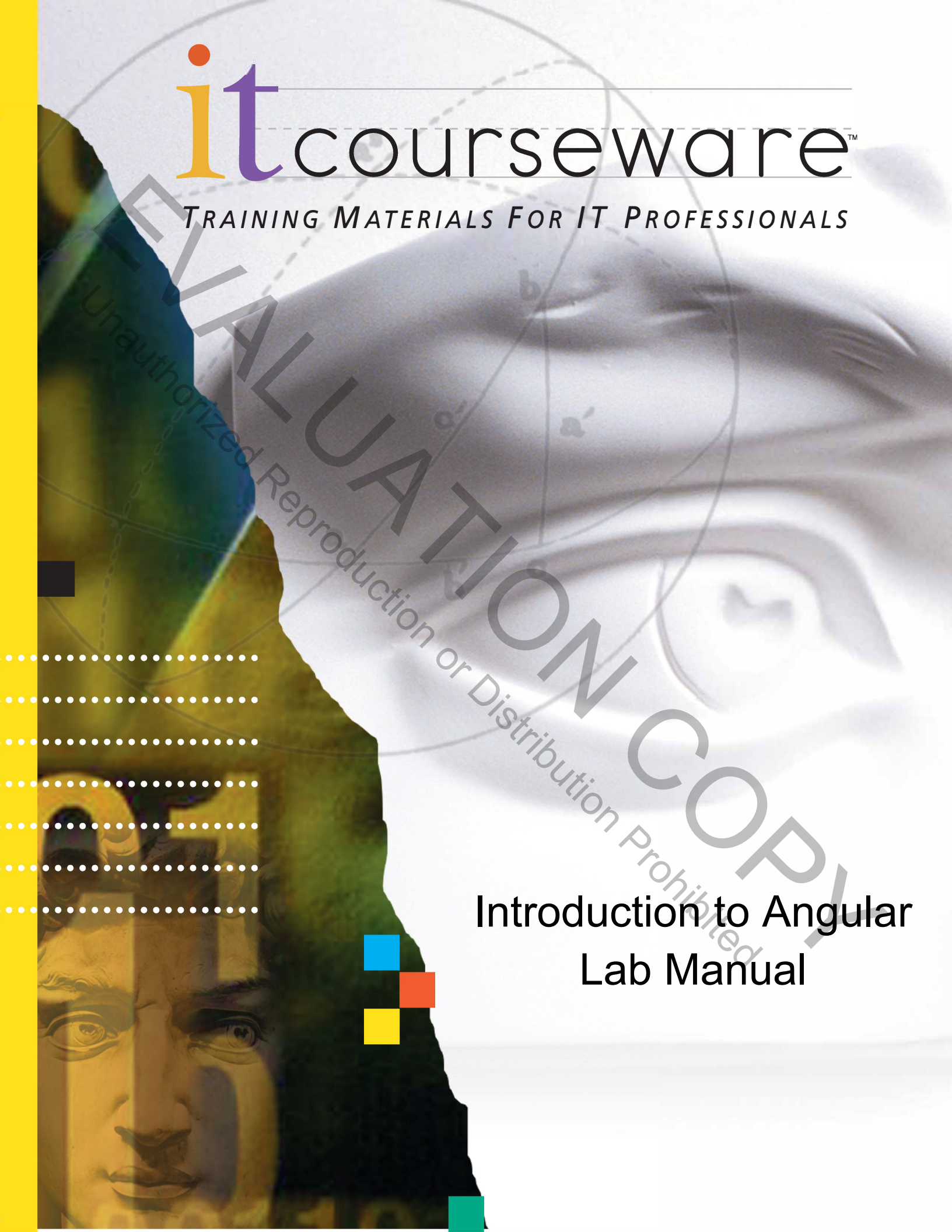

Introduction to Angular
Lab Manual

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Lab Manual

About this Lab Manual

This lab manual provides a series of hands-on exercises for learning how to build web applications using Angular.

Conventions

Each hands-on exercise in this manual will consist of a series of steps to accomplish a learning objective.

Code Blocks

- All paths in the are relative to the **project-manage** directory.

  So the file below will be found at:

  AngularCourse\code\labs\working\project-manage\app.module.ts

- Highlighted code indicates code that has changed. If the code is not highlighted it should already exist from a previous step.
- Code with a ~~Strikethrough~~ should be removed.
- `...` Indicates code has been omitted for formatting and clarity but you should leave these sections of code in your running application.
- Most code snippets are short and easy to type but some are longer so a file with the contents of the code to add is provided in the folder.

  AngularCourse\code\labs\snippets

  - If a code snippets is provided for a code block the file path will appear below the code block as show below.

app.module.ts

```
import { NgModule } from '@angular/core';
import { AppComponent } from './app.component';
import { BrowserModule } from '@angular/platform-browser';

@NgModule({
  declarations: [AppComponent],
  imports: [BrowserModule],
  bootstrap: [AppComponent],
})
```

snippets\lab00-step00.html

Commands

These commands should be run in a command-prompt (Windows) or terminal (Mac).

```
ng -v
```

Sidebars

The boxes are sidebars and should be read.

> The boxes with blue borders are information and tips.

> The boxes with red borders are alerts.

Completion

At the end of each lab you will see:

✓ You have completed Lab …

Lab 1: Creating a New Project

Objectives

- [ ] Verify the Angular CLI is installed
- [ ] Create a new Angular project
- [ ] Open the new project
- [ ] Review the default project structure

Steps

Verify the Angular CLI is installed

1. **Open** a **command prompt** (Windows) or **terminal** (Mac).

> You can be in *any* directory when you run the command because the Angular CLI is installed globally.

2. **Run** the command.

```
ng v
```

3. **Verify** the output.

Create a new Angular project

4. Change the current directory to **AngularCourse*code**labs**working***.

5. **Run** the command.

```
ng new project-manage
```

6. You will receive the following prompt. **Type y** to answer yes.

```
? Would you like to add Angular routing? (y/N)
```

7. You will receive another prompt. Hit **enter** to accept the default of CSS.

```
? Which stylesheet format would you like to use? (Use arrow keys)
› CSS
  SCSS   [ http://sass-lang.com   ]
  SASS   [ http://sass-lang.com   ]
  LESS   [ http://lesscss.org     ]
  Stylus [ http://stylus-lang.com ]
```

8. A new Angular project will be created for you.

> This could take a several minutes and requires an internet connection to install Angular and the other libraries from **npmjs.com**.

> Adding Angular routings tells the Angular CLI to create a routing module where we can configure our routes.
>
> Choosing CSS tells the CLI we want don't want to use a preprocessor for our styles.

Open the new project

9. Change the current directory (cd) to the directory you created in the last step.

```
cd project-manage
```

10. **Open** the **project-manage** directory in your **editor** of choice.

> If you are using Visual Studio Code you can run following command:
>
> ```
> code .
> ```
>
> …**code** refers to Visual Studio Code and **.** means current directory.

Review the default project structure

11. Take a few minutes to go over the **default** project **structure** with your instructor. Below are some things to discuss.

    a. Open **package.json** and review the **dependencies** (JavaScript libraries) installed as well as the **scripts**.

    b. Understand each of the files involved in **bootstrapping** (starting) an Angular application.

        1. app.component.html | app.component.ts
        2. index.html
        3. app.module.ts
        4. main.ts

✓ You have completed Lab 1

Lab 2: Running Your Project

Objectives

- [ ] Run the project
- [ ] Make a change and see the app update

Steps

Run the project

1. If you don't already have one open, **open** a **command prompt** (Windows) or **terminal** (Mac). Set the directory to **project-manage**.

```
ng serve --open
```

> The flag **--open** automatically opens your default web browser with the application running in it.

2. **Run** the command.

3. The project will:

   - build and bundle the code
   - open a development web server
   - open your default web browser

4. The page should display an Angular logo and the text shown below.

```
Welcome to project-manage!
```

> If your default browser is **Internet Explorer** you will see a blank page because the **polyfills** needed to support **IE** are not included by default.

- Uncomment the following lines to get the application working in **IE**.
  - You may need to stop the web server using **Ctrl+C** and then restart it using the command from the first step of this lab.

src\polyfills.ts

```
 * BROWSER POLYFILLS
 */

/** IE9, IE10 and IE11 requires all of the following polyfills. **/
import 'core-js/es6/symbol';
import 'core-js/es6/object';
import 'core-js/es6/function';
import 'core-js/es6/parse-int';
import 'core-js/es6/parse-float';
import 'core-js/es6/number';
import 'core-js/es6/math';
import 'core-js/es6/string';
import 'core-js/es6/date';
import 'core-js/es6/array';
import 'core-js/es6/regexp';
import 'core-js/es6/map';
import 'core-js/es6/weak-map';
import 'core-js/es6/set';
```

Make a change and see the app update

5. Open and edit the file:

src\app\app.component.ts

```
@Component({
  selector: 'app-root',
  templateUrl: './app.component.html',
  styleUrls: ['./app.component.css']
})
export class AppComponent {
  title = 'project-manage';
  title = 'my house';
}
```

6. Save your changes.
7. The browser should automatically reload and display.

```
Welcome to my house!
```

✓ You have completed Lab 2

Lab 3: Styles: Using a CSS Framework

Objectives

- ☐ Install a CSS framework
- ☐ Stop and restart the build and web server
- ☐ Verify styles are working in app

Steps

Install a CSS framework

1. **Open** a a **new** (*leave ng serve running*) **command prompt** (Windows) or **terminal** (Mac). Set the directory to **project-manage**.

2. Run the command.

```
npm install mini.css@3.0.0
```

- The JavaScript package manager **npm automatically adds mini.css** as a **dependency**.

package.json

```
"dependencies": {
...
    "core-js": "^2.5.4",
    "mini.css": "^3.0.0",
    "rxjs": "^6.0.0",
    "zone.js": "^0.8.26"
},
...
```

Mini.css is a **minimal**, responsive, style-agnostic **CSS framework.** Mini.css is similar to Bootstrap but lighter and **requires fewer CSS classes** so you can **focus on learning Angular** but still get a **professional look**.

3. **Include** the framework's **stylesheet** in the Angular CLI's configuration.

angular.json

```
 "projects": {
    "project-manage": {
      "root": "",
      "sourceRoot": "src",
      "projectType": "application",
      "prefix": "app",
      "schematics": {},
      "architect": {
        "build": {
          "builder": "@angular-devkit/build-angular:browser",
          "options": {
            "outputPath": "dist/project-manage",
            "index": "src/index.html",
            "main": "src/main.ts",
            "polyfills": "src/polyfills.ts",
            "tsConfig": "src/tsconfig.app.json",
            "assets": [
              "src/favicon.ico",
              "src/assets"
            ],
            "styles": [
              "node_modules/mini.css/dist/mini-default.min.css",
              "src/styles.css"
            ],
            "scripts": []
          },
...
```

In WebStorm files with a *.min.css extension are hidden under the un-minified version of the file.

Stop and restart the build and web server

4. **Focus** your cursor in the **command prompt** (Windows) or **terminal** (Mac). and use **[Ctrl+C]** to stop the build and web server.

> Windows users will be prompted if it is OK to terminate the process and should answer **[y+enter].**

5. **Run** the command.

```
ng serve --open
```

> Your current directory should still be set to **project-manage** or the above command will not work.

6. The application will **build** and **open** a **browser**.

Verify styles are working in app

7. **Open** the file **app\app.component.html**.

8. **Delete** all **contents** from the file.

9. **Add** the following quote.

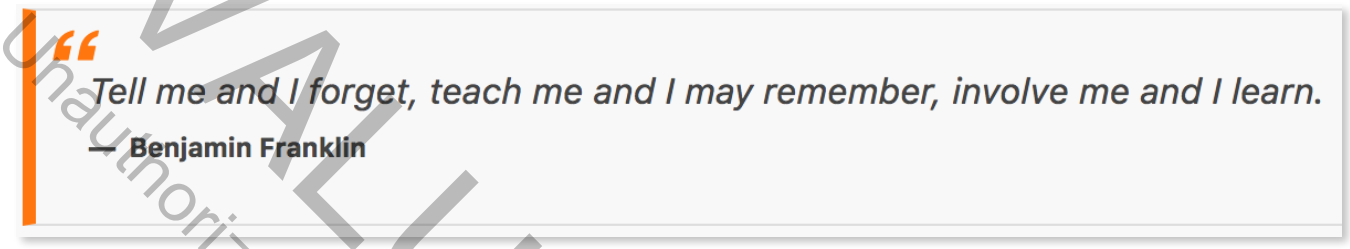
src\app\app.component.html

```
<blockquote cite="Benjamin Franklin">
    Tell me and I forget, teach me and I may remember, involve me and
    I learn.
</blockquote>
```

snippets\lab03-step09.html

10. Save your changes.

11. The browser should automatically reload and display the quote with the CSS styles shown below.



✓ You have completed Lab 3

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