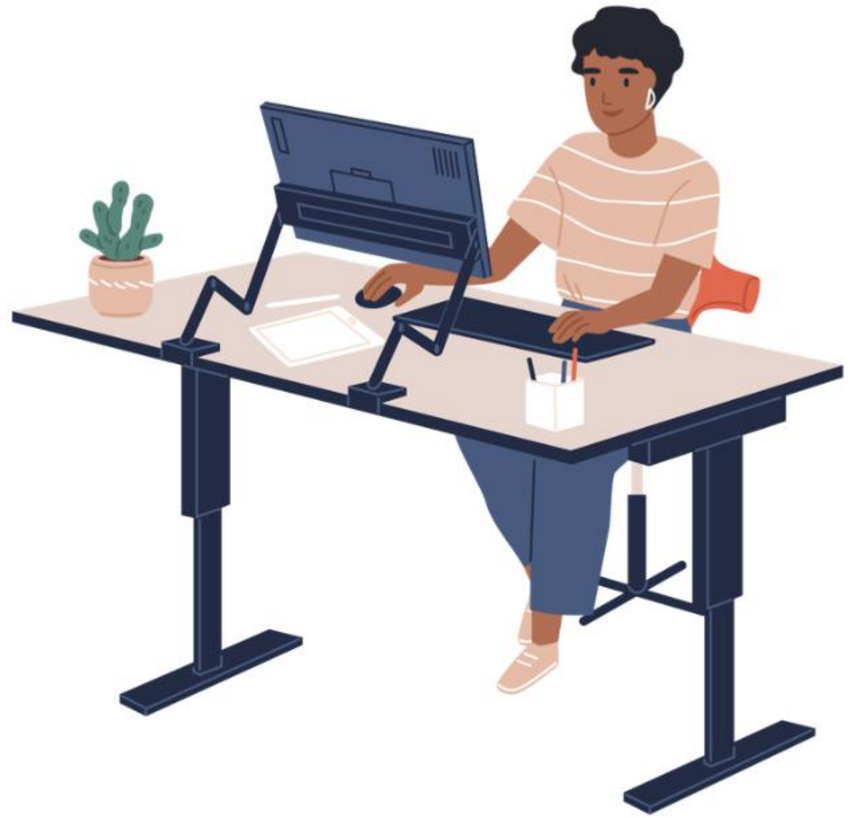
Slide Note

Learning Consolidation

Style a Single Page Application Using Angular Material



Slide Note

In this Sprint you learned to…

- Explain Material Design and its design principles
- Set up Angular Material in an Angular application
- Design an Angular application using Angular Material components
- Style an Angular application using an Angular Material pre-built themes
- Design an Angular application using an Angular Material schematics

Slide Note

In English, metaphor is a figure of speech in which a word is used in place of another word to indicate likeness or similarity.

For example: "It's been a real circus at home since Mom went on vacation."

Physical objects reflect light and cast shadows when put on any surface. Similarly, Material Design also uses these techniques to create a similar effect.

(e.g., card layout generates shadow and raised effect)

The print medium uses typography to create grids, arranges spaces, use colors and images. Material Design follows these methods to develop impactful rich UX, which could be bold, graphic-oriented, and purposeful. (e.g., grid system, icons, and color pallets are the areas where Material Design has a good role to play)

The third principle deals with the impact created by motion.

o The motion focuses attention.

o At the same time, it is expected to be fluid, and transitions should be coherent (smooth and not jerky and related).

o Material Design follows this principle to generate fluid experiences.

o (e.g., ripple effect)

Material Design – Design Principles

- The following principles guide the design:
- Material is the metaphor
  - The UI with Material Design resembles real-world objects, its textures, and shadow effects.
    - CSS properties such as border, border radius, and box-shadow help in the creation of these effects.
- Bold, Graphic, Intentional
  - The Material Design renders contents with typography (font-system), grid layouts, spacing, color, and visual descriptions (using icons) like a print medium design.
  - It helps create designs that have a hierarchical structure and are intuitive.
- Motion provides meaning
  - When the elements appear onscreen or users interact with them, they produce a motion effect.
  - This effect helps give subtle feedback to users.
    - For example, a ripple effect is generated when a user clicks a button.

Slide Note

The link navigates to web page that plays video showing how a simple web page gets transformed when Material Design is applied.

Click Here to Watch Material Design in Action

Slide Note

Nowadays, people do not stick with one application for their favorites; they have many choices. If they have a bad experience, they quickly switch to another application.

For example, if they do not get a good experience with the Ola app, they switch to the Uber app. If they do not get a good experience with the Swiggy app, they switch to the Zomato app.

So always ensure that a user experience (UX) is great, so one becomes engaged with the experience and does not leave the app. Therefore, we have to build great user experiences with less effort and time.

Angular Material can help us to a great extent. It has a set of components made up of all design philosophies. The components from Angular Material can be used to make the application with a great User Experience.

Features of a "Good" Component:

Ease of accessibility

Bidirectionality (LTR, RTL) with rendering

Theme and Color Palettes for styling

Unit testability of components

Material Design implementation helps in creating such "Good" components.

Can You Add Material Design to Angular Applications?

- Angular Material comes packed with a rich library of Angular Material components, themes, and schematics that help Angular master the creation of "good" components.
- Yes, you can add Material Design to Angular by installing Angular Material in the Angular project.
- The installation allows the developer to:
  - Design views using Angular Material components
  - Add Angular Material schematics for quick UI design
  - Style Angular application views using Angular Material pre-built themes

Slide Note

Angular Material

- Material design is implemented in Angular using Angular Material.
- Angular Material components help construct attractive, consistent, and functional web pages and applications.
- It adheres to modern web design principles like browser portability, device independence, and graceful degradation.
- It helps in creating faster, more beautiful, and more responsive websites.

Slide Note

Answers:

1. Command to install - ng add @angular/material.

2. Packages installed: Angular Material, CDK, Angular Animations.

3. Questions Prompted:

   a) Choose pre-built theme or custom theme.

   b) Whether to apply global typography styles.

   c) Whether to set-up browser animations.

4. Configurations carried out:

   1. Add project dependencies to package.json.

   2. Add the Roboto font to your index.html.

   3. Add the Material Design icon font to your index.html.

   4. Remove margins from body

   5. Set height: 100% on html and body

   6. Set Roboto as the default application font

Install Angular Material

- Use the Angular CLI's installation schematic to set up Angular Material .
- The command to set up the same is:

```
ng add @angular/material
```

- The command installs:
  - Angular Material
  - Component Dev Kit (CDK)
  - Angular Animations

Slide Note

Self-Check

While setting up Angular Material, a developer is prompted with questions related to:

1. Choosing a pre-built theme or “custom” for a custom theme
2. Setting up global Angular Material typography styles
3. Setting up browser animations
4. Styling with `.css`, `.sass`, `.scss`

Slide Note

Self-Check: Solution

While setting up Angular Material, a developer is prompted with questions related to:

1. **Choosing a pre-built theme or "custom" for a custom theme**
2. **Setting up global Angular Material typography styles**
3. **Setting up browser animations**
4. Styling with `.css`, `.sass`, `.scss`

Slide Note

Self-Check

Which Angular Material component would you use to show the number of items in the cart in an online shopping app?

1. Chips

2. Badges

3. Tooltips

4. Status

Slide Note

Self-Check: Solution

Which Angular Material component would you use to show the number of items in the cart in an online shopping app?

1. Chips

2. **Badges**

3. Tooltips

4. Status

Slide Note

Self-Check

Which Angular Material component would you use to implement the checkout process in an online shopping app if the process is carried out in steps such as requesting order confirmation, capturing the delivery address, and capturing the payment details?

1. Slider
2. Stepper
3. AutoComplete
4. None of the above

Slide Note

Self-Check: Solution

Which Angular Material component would you use to implement the checkout process in an online shopping app if the process is carried out in steps such as requesting order confirmation, capturing the delivery address, and capturing the payment details?

1. Slider
2. **Stepper**
3. AutoComplete
4. None of the above

Slide Note

Sass is an extension to CSS.

It's a pre-processor for CSS that helps to reduce the repetition of CSS and saves time.

A palette is a collection of colors representing a portion of color space. Each value in this collection is called a hue.

In Material Design, each hue in a palette has an identifier number.

Angular Material pre-built Themes

- Angular Material's theming APIs are built with `Sass` (Syntactically Awesome StyleSheet).
- You can use Angular Material without `Sass` by using a pre-built theme.
- Angular Material includes four pre-built theme CSS files, each with a different palette.

Theme	Light or dark?	Palettes (primary, accent, warn)
`deeppurple-amber.css`	Light	deep-purple, amber, red
`indigo-pink.css`	Light	indigo, pink, red
`pink-bluegrey.css`	Dark	pink, bluegrey, red
`purple-green.css`	Dark	purple, green, red

Slide Note

Angular Material Theming

- Angular Material's theming system lets you customize the color and typography styles for components in your application.
- Each theme includes three palettes that determine component colors:
  - A primary palette for the color that appears most frequently throughout your application.
  - An accent or secondary palette is used to highlight key parts of your UI selectively.
  - A warning or error palette is used for warnings and error states.

Slide Note

Palettes

A palette is a collection of colors representing a portion of color space. Each value in this collection is called a hue.

- In Material Design, each hue in a palette has an identifier number.
- These identifier numbers include 50 and then each 100th value between 100 and 900.
- The numbers refer to hues within a palette, from the lightest to the darkest.
- Angular Material offers predefined palettes based on the 2014 version of the Material Design specification.

Slide Note

Self-Check

To include a pre-built theme in the Angular application, into which file should the chosen `.css` pre-built theme file be added?

1. In `package.json` file
2. In `index.html` file
3. In `angular.json` file
4. In `tsconfig.json` file

Slide Note

Self-Check: Solution

To include a pre-built theme in the Angular application, into which file should the chosen `.css` pre-built theme file be added?

1. In `package.json` file
2. In `index.html` file
3. **In `angular.json` file**
4. In `tsconfig.json` file

Slide Note

Schematics are included with both @angular/cdk and @angular/material.

For example:

ng add @angular/material

Angular uses the `ng add` command here to add angular material library to the angular project

- ng update

Angular uses the `update` command here to update dependency of the workspace library.

Angular Material Schematics

- Angular Material comes packaged with Angular CLI schematics that make creating Material applications easier.
  - A schematic is used to generate complex code based on a template.
  - It is a set of instructions for transforming a software project by generating or modifying code.
  - Example: `ng generate component <component-name>`
    - `Component` is the generation schematic here that is executed using the `ng generate` command to generate component code with `.html`, `.css`, `.ts` and `.spec.ts` files.
- In addition to the installation schematic, Angular Material comes with multiple schematics that can be used to generate Material Design components easily.
- Once you install the `npm` packages for Angular Material, they will be available through the Angular CLI.

Slide Note

The List of Angular Material Schematics

Name	Description
Address form	Component with a form group that uses Material Design form controls to prompt for a shipping address
Navigation	Component with a responsive Material Design side navbar and a toolbar for showing the app name
Dashboard	Component with multiple Material Design cards and menus that are aligned in a grid layout
Table	Component with a Material Design data table that supports sorting and pagination
Tree	Component that interactively visualizes a nested folder structure by using the <mat-tree> component
Drag and Drop	Component that uses the `@angular/cdk/drag-drop` directives for creating an interactive to-do list

Slide Note

Self-Check

Which of the following schematics belong to Angular CDK?

1. address-form
2. navigation
3. dashboard
4. drag-drop

Slide Note

Self-Check: Solution

Which of the following schematics belong to Angular CDK?

1. address-form
2. navigation
3. dashboard
4. **drag-drop**

Slide Note

Angular Material Typography

- Typography is used to make a text legible and appealing when displayed.
- Angular Material's themeing system supports customizing the typography settings for the library's components.
- Angular Material's typography APIs let you specify any font face.
- The default font-face value is configured to Google's `Roboto` font with 300, 400, and 500 font-weight styles.
- To use `Roboto`, your application must load the font, which is not included with Angular Material.

Slide Note

Typography Levels

Name	Description
`display-4`	112px, one-off header, usually at the top of the page (e.g. a hero header).
`display-3`	56px, one-off header, usually at the top of the page (e.g. a hero header).
`display-2`	45px, one-off header, usually at the top of the page (e.g. a hero header).
`display-1`	34px, one-off header, usually at the top of the page (e.g. a hero header).
`headline`	Section heading corresponding to the `<h1>` tag.
`title`	Section heading corresponding to the `<h2>` tag.
`subheading-2`	Section heading corresponding to the `<h3>` tag.
`subheading-1`	Section heading corresponding to the `<h4>` tag.
`body-1, body-2`	Base body text.
`caption`	Smaller body and hint text.
`button`	Buttons and anchors.
`input`	Form input fields.

Slide Note

The Angular Material provides CSS classes that correspond to the typography levels in the typography configuration.

How Is Typography Implemented?

CSS class	Level name	Native elements
.mat-display-4	display-4	None
.mat-display-3	display-3	None
.mat-display-2	display-2	None
.mat-display-1	display-1	None
.mat-h1 or .mat-headline	headline	<h1>
.mat-h2 or .mat-title	title	<h2>
.mat-h3 or .mat-subheading-2	subheading-2	<h3>
.mat-h4 or .mat-subheading-1	subheading-1	<h4>
.mat-h5, .mat-h6	None	<h5>, <h6>
.mat-body or .mat-body-1	body-1	Body text
.mat-body-strong or .mat-body-2	body-2	None
.mat-small or .mat-caption	caption	None