

IN4MATX 133: User Interface Software

Lecture 13:
Ionic Components

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Announcements

- Ionic demo in Friday's discussion (Lucas)
 - 3-4pm demo, 4-5pm office hours
- A4 is posted
 - Start early!
 - Option 1 (native resources) requires some tricky setup, particularly for iOS
- If you tell something to one of the course staff,
you can assume we've shared it with the others :-)
 - Course email is the best way of reaching all of us at once

Today's goals

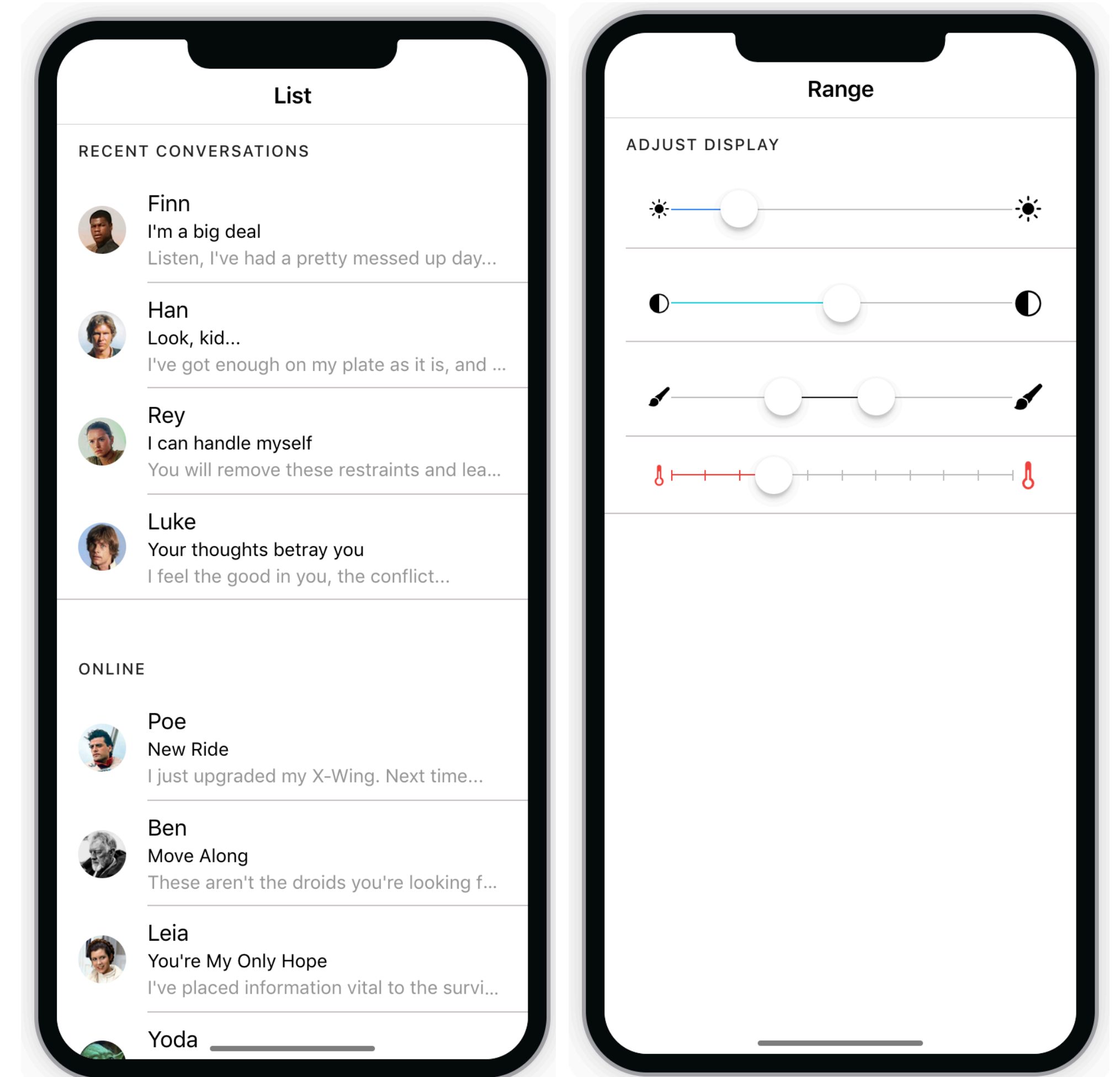
By the end of today, you should be able to...

- Use Ionic Components to make a mobile-friendly app
 - Display structured content with items and lists
 - Style content with colors, icons, and badges
 - Receive user input with inputs and modals
- Use routing to move between pages of your Ionic app

Ionic components

- Ionic provides Angular-style components for a lot of interface elements common in mobile interfaces
 - Lists, buttons, sliders, tabs, modal dialogs, search bars, much more
- We'll use Ionic 4 in this class

<https://ionicframework.com/docs/components/>



Ionic component documentation

- Each component has a lot of potential attributes and properties
- The documentation enumerates many of the options
- Today is an **overview**.
 - There are more components than we can reasonably discuss
 - Each component has more options than we can reasonably discuss
- The best way to learn them is to try them out

Types of Ionic components

- Structural
- Items
- Icons
- Inputs
- Lists
- Modals

Types of Ionic components

- **Structural**

- Items
- Icons
- Inputs
- Lists
- Modals

Structural

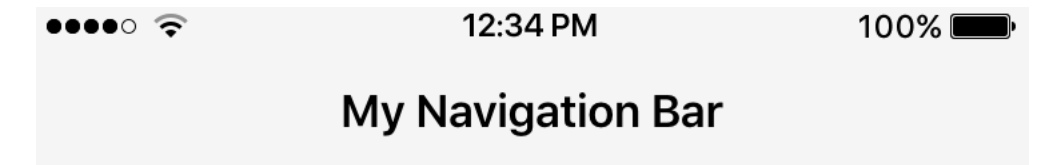
- Three structural components:
 - `<ion-content>`: holds the page's main content
 - `<ion-header>`: top bar for title content
 - `<ion-footer>`: bottom bar menu content
- Headers and footers can contain `<ion-toolbar>` with text & buttons
- A few other components can replace header and footer
 - `<ion-tabs>` for a footer with tabs to different pages

Structural

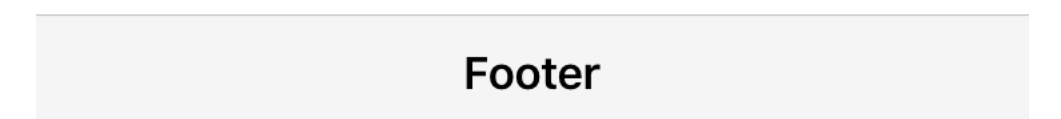
```
<ion-header>
  <ion-toolbar>
    <ion-title>My Navigation Bar</ion-title>
  </ion-toolbar>
</ion-header>
```

```
<ion-content>
  Content here...
</ion-content>
```

```
<ion-footer>
  <ion-toolbar>
    <ion-title>Footer</ion-title>
  </ion-toolbar>
</ion-footer>
```



Content here...



Types of Ionic components

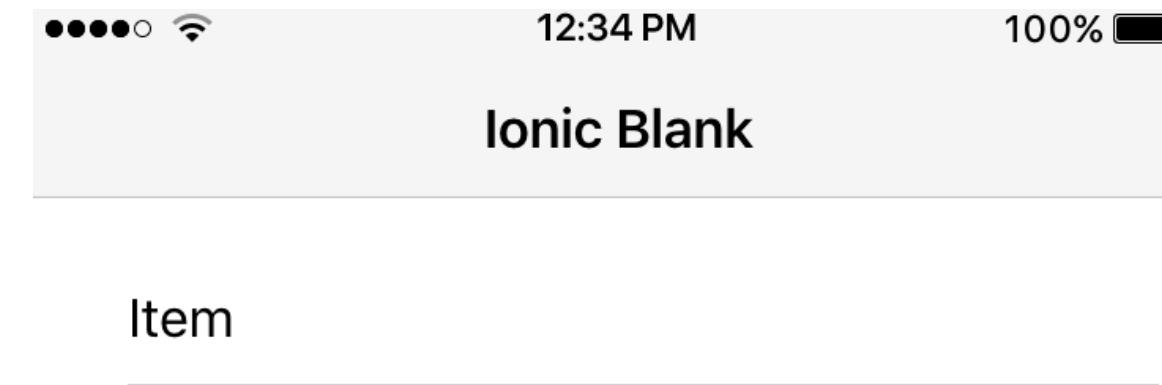
- Structural
- **Items**
- Icons
- Inputs
- Lists
- Modals

Items

- `<ion-item>` is the most basic component
- It's essentially an HTML `<div>`
 - Can hold text, images, and other things
 - Has a css "block" style, so it shows up as a row
- Lots of other components need to be inside of `<ion-item>`
 - For example, `<ion-label>` to put text inside of an `<ion-item>`

Items

```
<!-- Default Item -->  
<ion-item>  
  <ion-label>  
    Item  
  </ion-label>  
</ion-item>
```



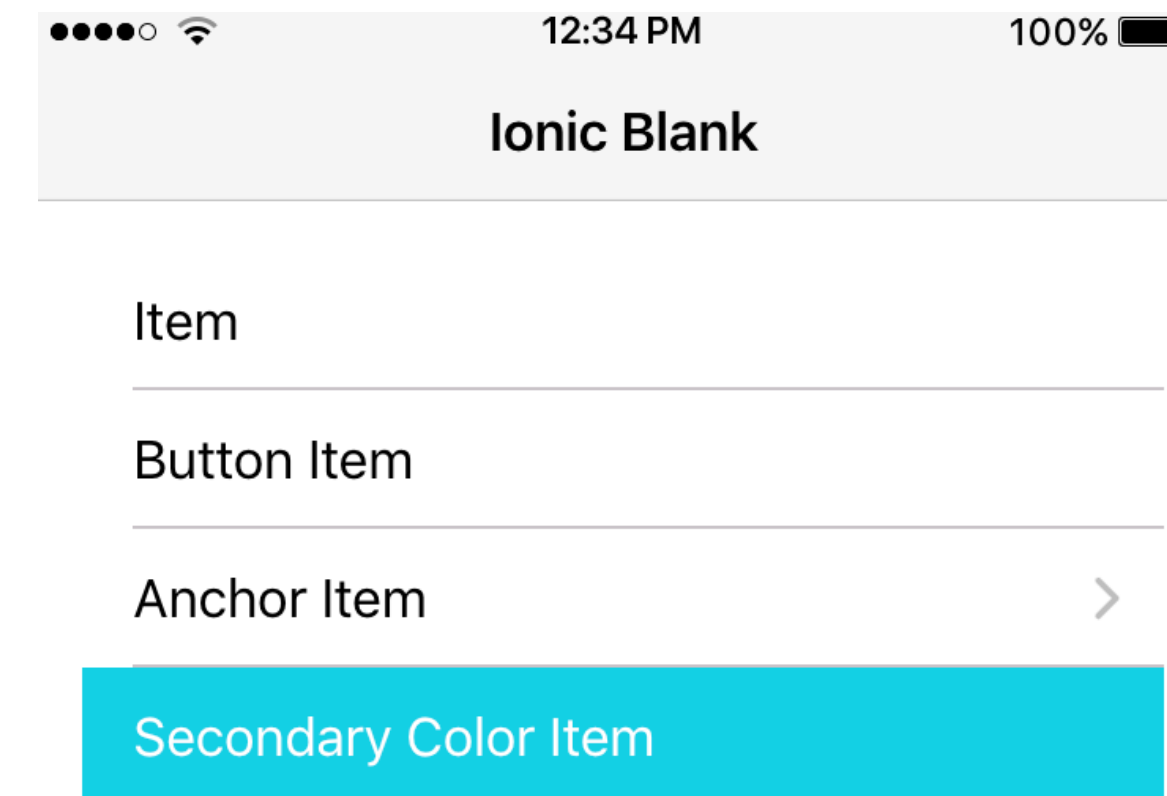
Items

```
<!-- Default Item -->
<ion-item>
  <ion-label>
    Item
  </ion-label>
</ion-item>

<!-- Item as a Button -->
<ion-item (click)="buttonClick()">
  <ion-label>
    Button Item
  </ion-label>
</ion-item>

<!-- Item as an Anchor -->
<ion-item href="https://www.ionicframework.com">
  <ion-label>
    Anchor Item
  </ion-label>
</ion-item>

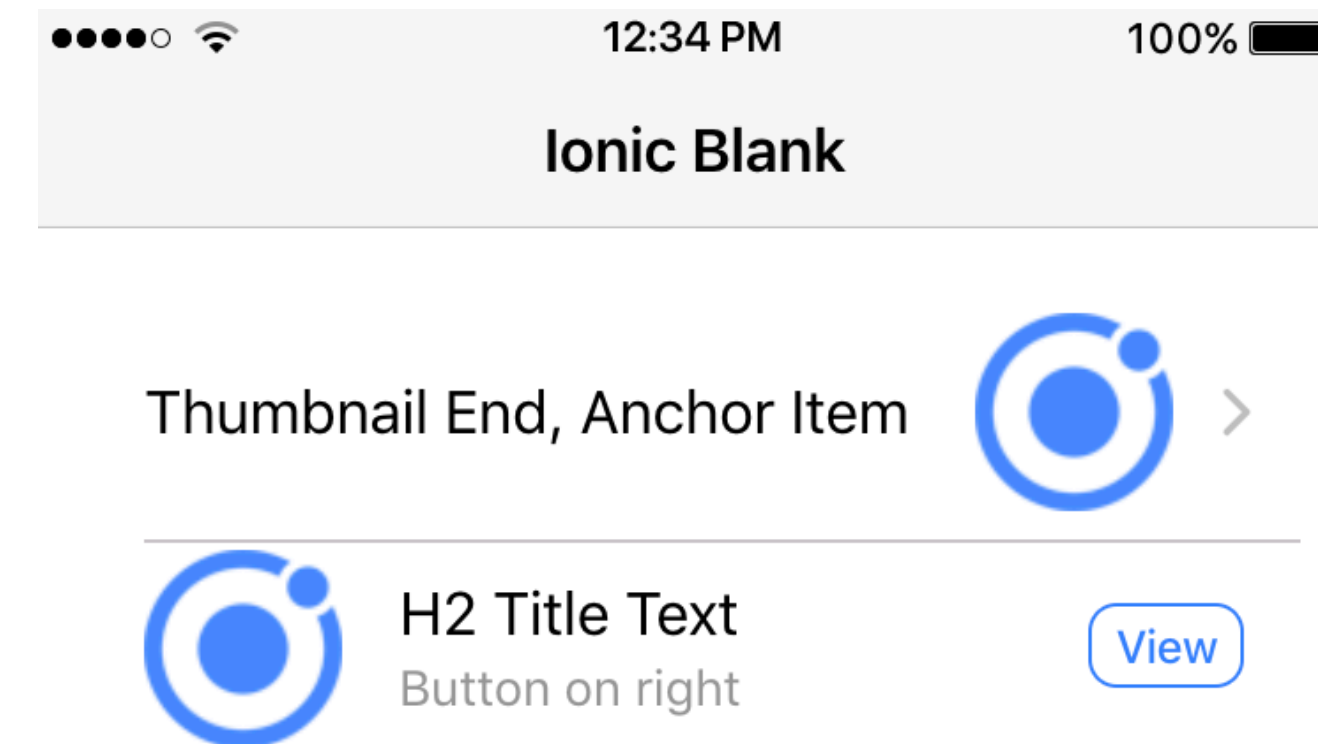
<ion-item color="secondary">
  <ion-label>
    Secondary Color Item
  </ion-label>
</ion-item>
```



Items

```
<ion-item href="#">
  <ion-label>
    Thumbnail End, Anchor Item
  </ion-label>
  <ion-thumbnail slot="end">
    
  </ion-thumbnail>
</ion-item>
```

```
<ion-item>
  <ion-thumbnail slot="start">
    
  </ion-thumbnail>
  <ion-label>
    <h2>H2 Title Text</h2>
    <p>Button on right</p>
  </ion-label>
  <ion-button fill="outline" slot="end">View</ion-button>
</ion-item>
```

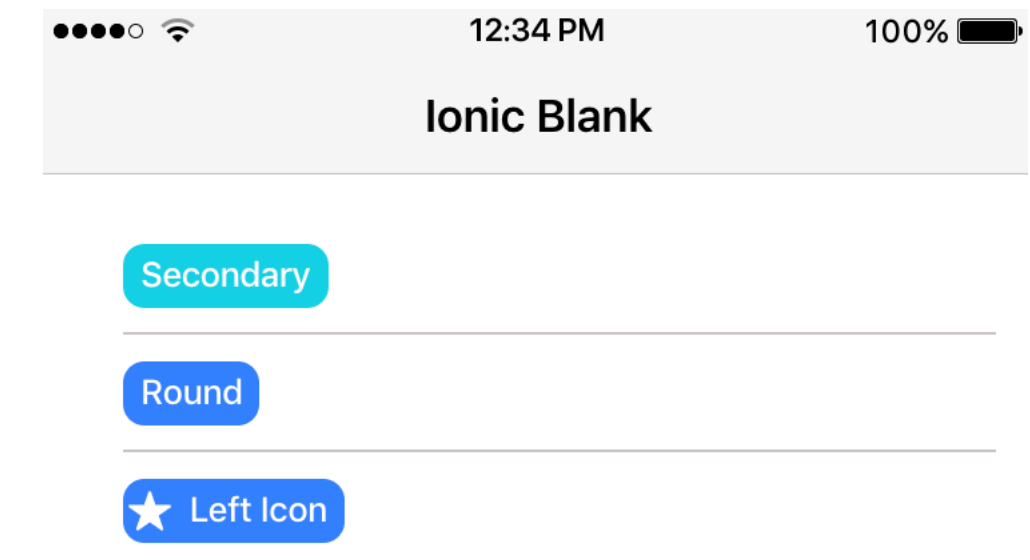


Items

```
<ion-item>
  <ion-button color="secondary">Secondary</ion-button>
</ion-item>
```

```
<ion-item>
  <ion-button shape="round">Round</ion-button>
</ion-item>
```

```
<ion-item>
  <ion-button>
    <ion-icon slot="start" name="star"></ion-icon>
    Left Icon
  </ion-button>
</ion-item>
```



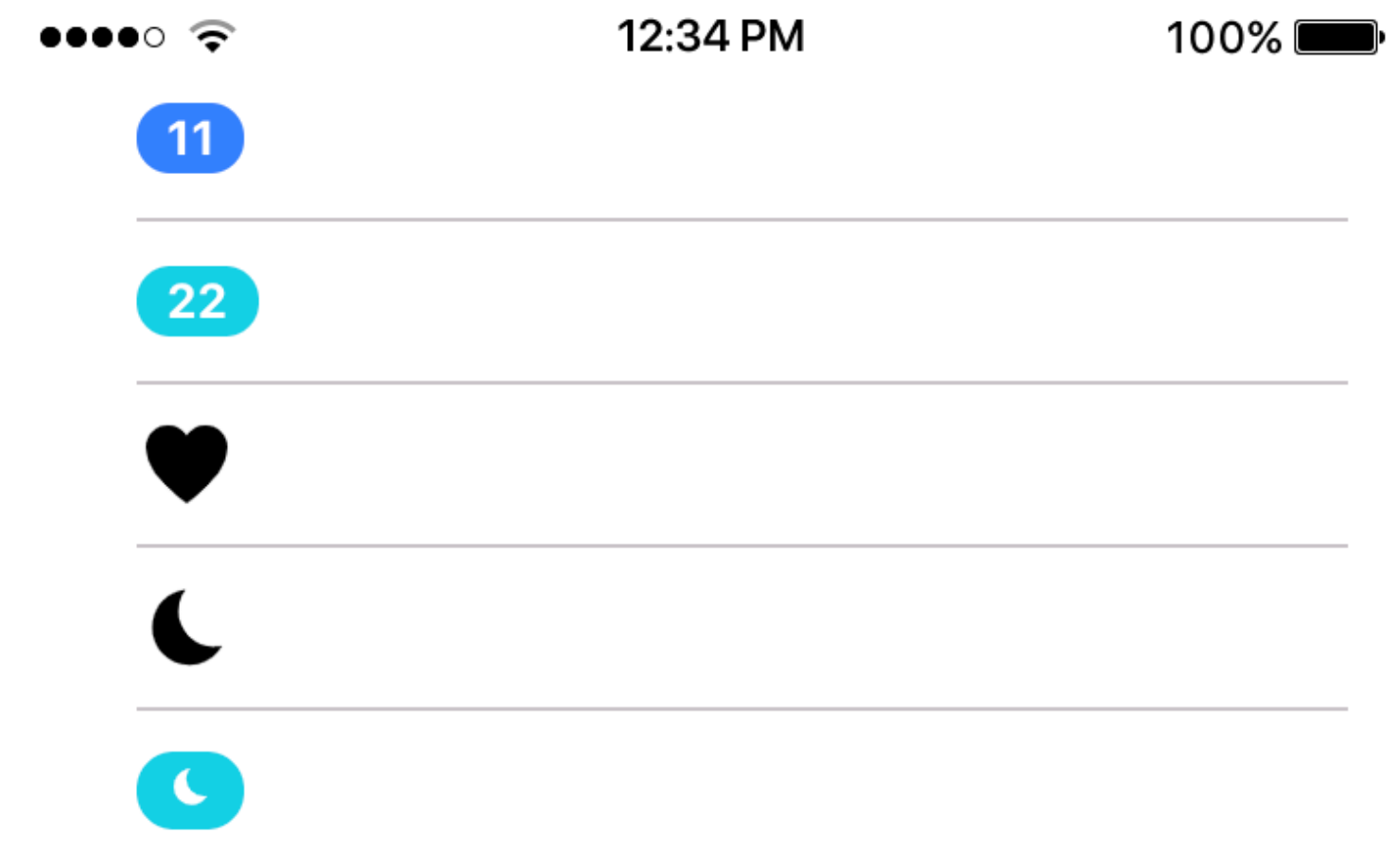
Types of Ionic components

- Structural
- Items
- **Icons**
- Inputs
- Lists
- Modals
- Menus

Icons

- Can add labels or fun flavor

```
<ion-item>
  <ion-badge color="primary">11</ion-badge>
</ion-item>
<ion-item>
  <ion-badge color="secondary">22</ion-badge>
</ion-item>
<ion-item>
  <ion-icon name="heart"></ion-icon>
</ion-item>
<ion-item>
  <ion-icon name="moon"></ion-icon>
</ion-item>
<ion-item>
  <ion-badge color="secondary">
    <ion-icon name="moon"></ion-icon>
  </ion-badge>
</ion-item>
```



<https://ionicons.com/>

Types of Ionic components

- Structural
- Items
- Icons
- **Inputs**
- Lists
- Modals

Inputs

- Ionic provides a lot of common input fields
 - DateTime
 - Checkbox
 - Button
 - Text input
 - ...
- For the most part, they should always be in an ion-item
- Bound just as in Angular, with two-way binding on `[(ngModel)]`

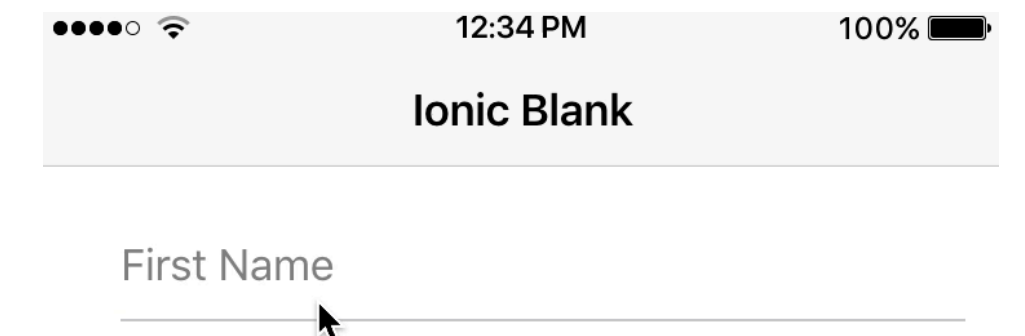
Inputs

```
<ion-item>  
  <ion-label>Date</ion-label>  
  <ion-datetime display-format="MM/DD/YYYY">  
  </ion-datetime>  
</ion-item>
```



Inputs

```
<ion-item>
  <ion-input required type="text"
    placeholder="First Name"></ion-input>
</ion-item>
```

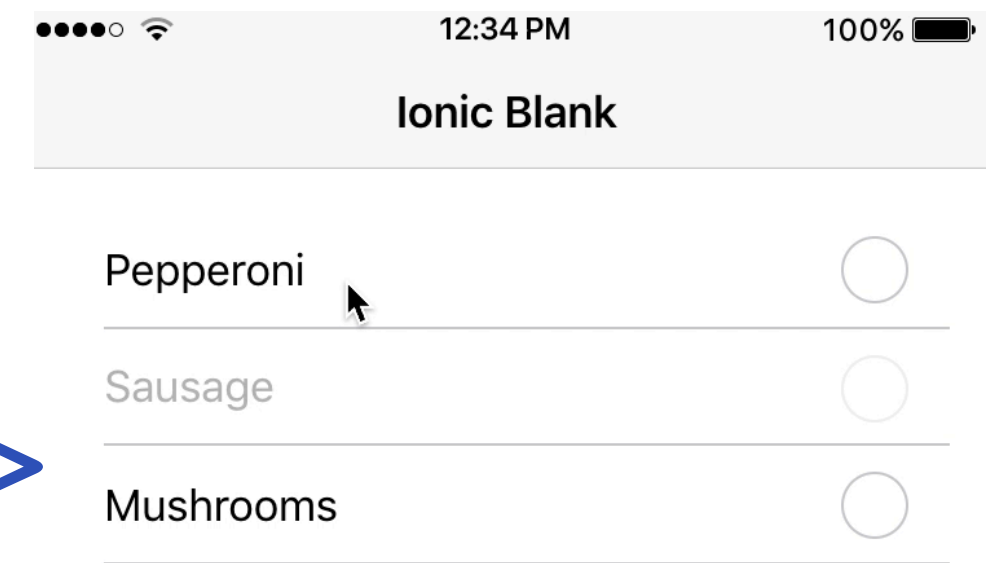


Inputs

```
<ion-item>
  <ion-label>Pepperoni</ion-label>
  <ion-checkbox [ (ngModel) ]="pepperoni"></ion-checkbox>
</ion-item>
```

```
<ion-item>
  <ion-label>Sausage</ion-label>
  <ion-checkbox [ (ngModel) ]="sausage" disabled="true"></ion-checkbox>
</ion-item>
```

```
<ion-item>
  <ion-label>Mushrooms</ion-label>
  <ion-checkbox [ (ngModel) ]="mushrooms"></ion-checkbox>
</ion-item>
```



Types of Ionic components

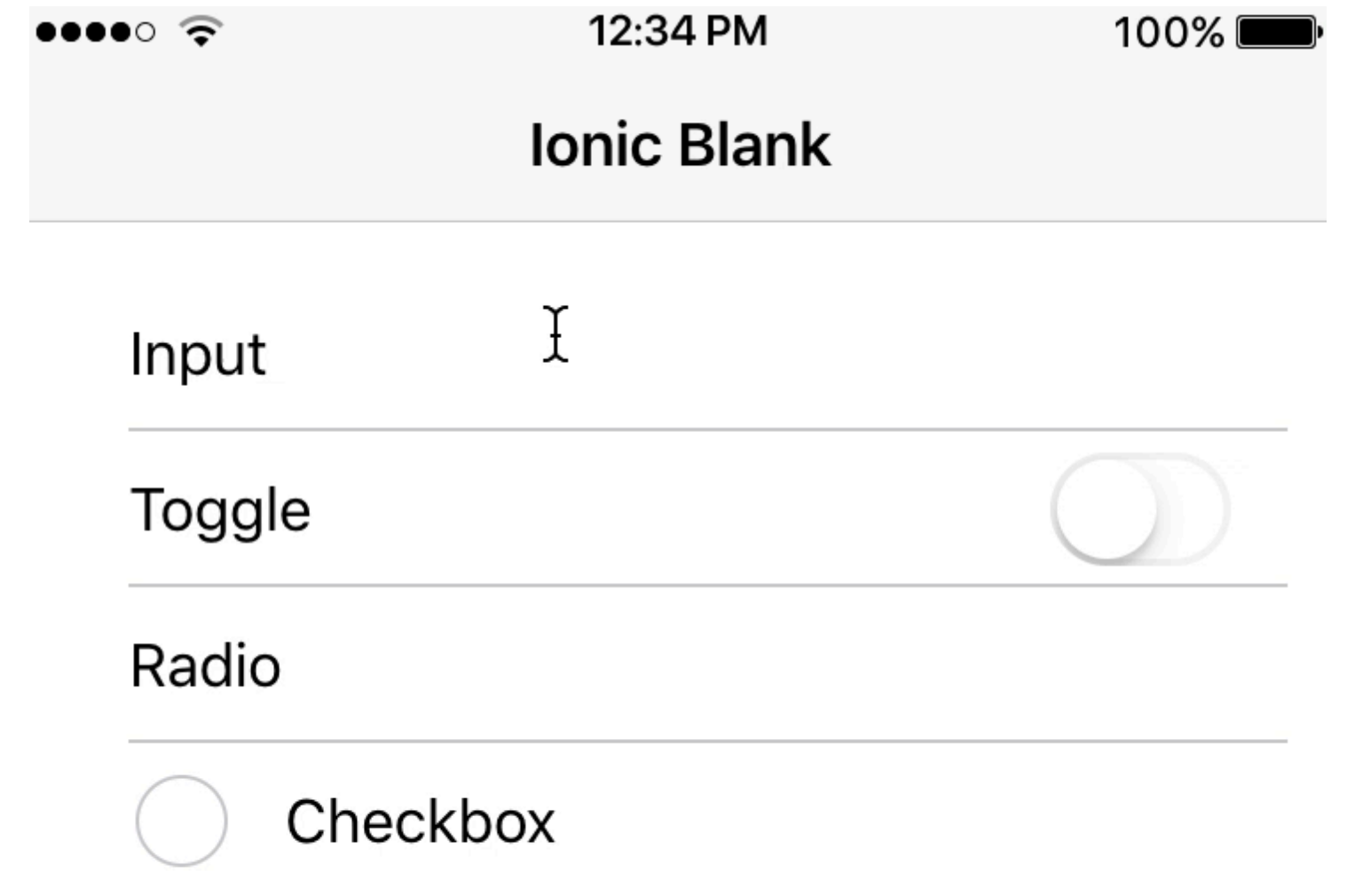
- Structural
- Items
- Icons
- Inputs
- **Lists**
- Modals

Lists

- Display rows of information
- Can provide some structure to items
- Styling lists, rather than items individually, can come in handy

Lists

```
<ion-list>
  <ion-item>
    <ion-label>Input</ion-label>
    <ion-input></ion-input>
  </ion-item>
  <ion-item>
    <ion-label>Toggle</ion-label>
    <ion-toggle slot="end"></ion-toggle>
  </ion-item>
  <ion-item>
    <ion-label>Radio</ion-label>
    <ion-radio slot="end"></ion-radio>
  </ion-item>
  <ion-item>
    <ion-label>Checkbox</ion-label>
    <ion-checkbox slot="start"></ion-checkbox>
  </ion-item>
</ion-list>
```



Lists

- Lists can contain tags other than `<ion-item>`
- For example, `<ion-card>` provides a “card” layout for presenting information

Lists

```
<ion-list>
  <ion-card>
    <ion-card-header>
      <ion-card-subtitle>Card Subtitle</ion-card-subtitle>
      <ion-card-title>Card Title</ion-card-title>
    </ion-card-header>

    <ion-card-content>
      Card content
    </ion-card-content>
  </ion-card>

  <ion-card>
    <ion-item>
      <ion-icon name="pin" slot="start"></ion-icon>
      <ion-label>ion-item in a card, icon left, button right</ion-label>
      <ion-button fill="outline" slot="end">View</ion-button>
    </ion-item>
  </ion-card>
</ion-list>
```

Card Subtitle

Card Title

Card content



ion-item in a card, icon ...

[VIEW](#)

Lists, Items, and Inputs



Apple iOS

12:34 PM 100%

My Shopping List

- ☐ Broccoli
- ☐ Bread
- ☒ Orange Juice
- ☐ Apples

Check Out

Question



So far, how confident are you that you'll be able to use Ionic's components?

- ☐ A I have a lot of questions about how to use them
- ☐ B I have a few questions about how to use them
- ☐ C I'm still digesting the information, check in again later
- ☐ D I think I can figure it out once I start
- ☐ E I'm confident I'll be able to use them

Types of Ionic components

- Structural
- Items
- Icons
- Inputs
- Lists
- **Modals**

Modals

- Intended for quick entry or alerts
- Appear over the app's main content
- Two different styles
 - Modal dialogs
 - Modal pages
- Usually triggered in model or controller (`.ts`) rather than view (`.html`)

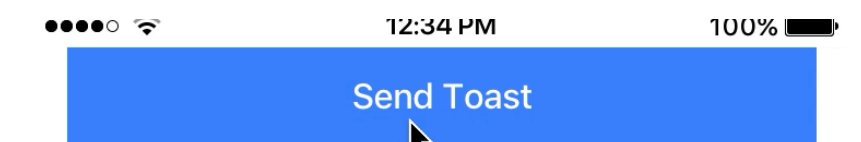
Modal dialogs

```
<!--HTML-->
<ion-button expand="full" color="primary" (click)="presentToast()">Send Toast</ion-button>

/*TypeScript*/
import { ToastController } from '@ionic/angular';

export class HomePage {
  /*Inject ToastController*/
  constructor(public toastController: ToastController) {}

  presentToast() {
    this.toastController.create({
      message: 'Hello, world!',
      duration: 2000
    }).then((toast) => {
      toast.present();
    });
  }
}
```



Modal dialogs

Async/await syntax (same functionality)

```
import { ToastController } from '@ionic/angular';

export class HomePage {
  constructor(public toastController: ToastController)
  {}

  presentToast() {
    this.toastController.create({
      message: 'Hello, world!',
      duration: 2000
    }).then((toast) => {
      toast.present();
    });
  }
}
```

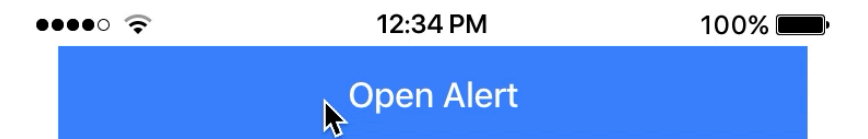
```
import { ToastController } from '@ionic/angular';

export class HomePage {
  constructor(public toastController: ToastController)
  {}

  async presentToast() {
    var toast = await this.toastController.create({
      message: 'Hello, world!',
      duration: 2000
    });
    toast.present();
  }
}
```

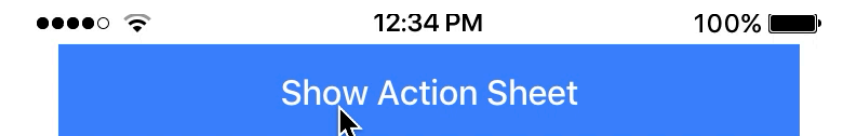
Modal dialogs

```
presentAlert() {  
  this.alertController.create({  
    header: 'Alert',  
    subHeader: 'Subtitle',  
    message: 'This is an alert message.',  
    buttons: ['OK']  
  }).then((alert) => {  
    alert.present();  
  });  
}
```



Modal dialogs

```
presentActionSheet() {  
  this.actionSheetController.create({  
    header: 'Albums',  
    buttons: [{  
      text: 'Delete',  
      role: 'destructive',  
      icon: 'trash',  
      handler: () => {  
        console.log('Delete clicked');  
      }  
    }, {  
      text: 'Cancel',  
      icon: 'close',  
      role: 'cancel',  
      handler: () => {  
        console.log('Cancel clicked');  
      }  
    }]  
  }).then((actionSheet) => {  
    actionSheet.present();  
  });  
}
```



Modal pages

- Opens up a new page over the current page
 - All pages are components themselves
- Useful for small entry, has more flexibility than dialogs
- Any pages instantiated in model/controller (.ts) must be added to the `entryComponents` and the declarations in `app.module.ts`
 - Resolves “No component factory found” error

<https://stackoverflow.com/questions/51778258/ionic-4-using-modals-via-the-modalcontroller>

Modal pages

Create modal page

```
import { ModalController } from '@ionic/angular';
import { ModalPage } from '../modal/modal.page';

export class HomePage {
  constructor(public modalController: ModalController) {}

  presentModal() {
    this.modalController.create({
      component: ModalPage,
      componentProps: { name: "IN4MATX 133" }
    }).then((modal) => {
      modal.present();
    });
  }
}
```

Modal pages

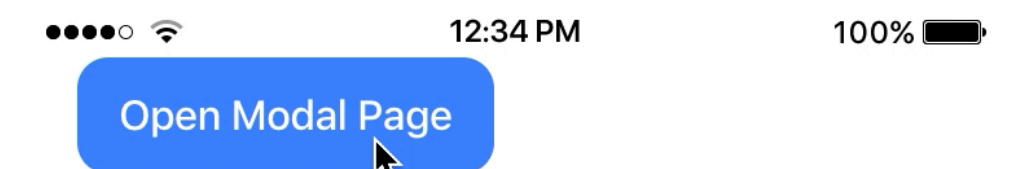
Modal page's view & controller

```
<ion-content padding>
  Hello, {{name}}!
  <ion-button (click)="dismiss()">Dismiss</ion-button>
</ion-content>
```

```
import { ModalController } from '@ionic/angular';

export class ModalPage implements OnInit {
  @Input() name:string;
  constructor(public modalController:ModalController) { }

  dismiss() {
    this.modalController.dismiss();
  }
}
```



Modal pages

Getting data from modal pages

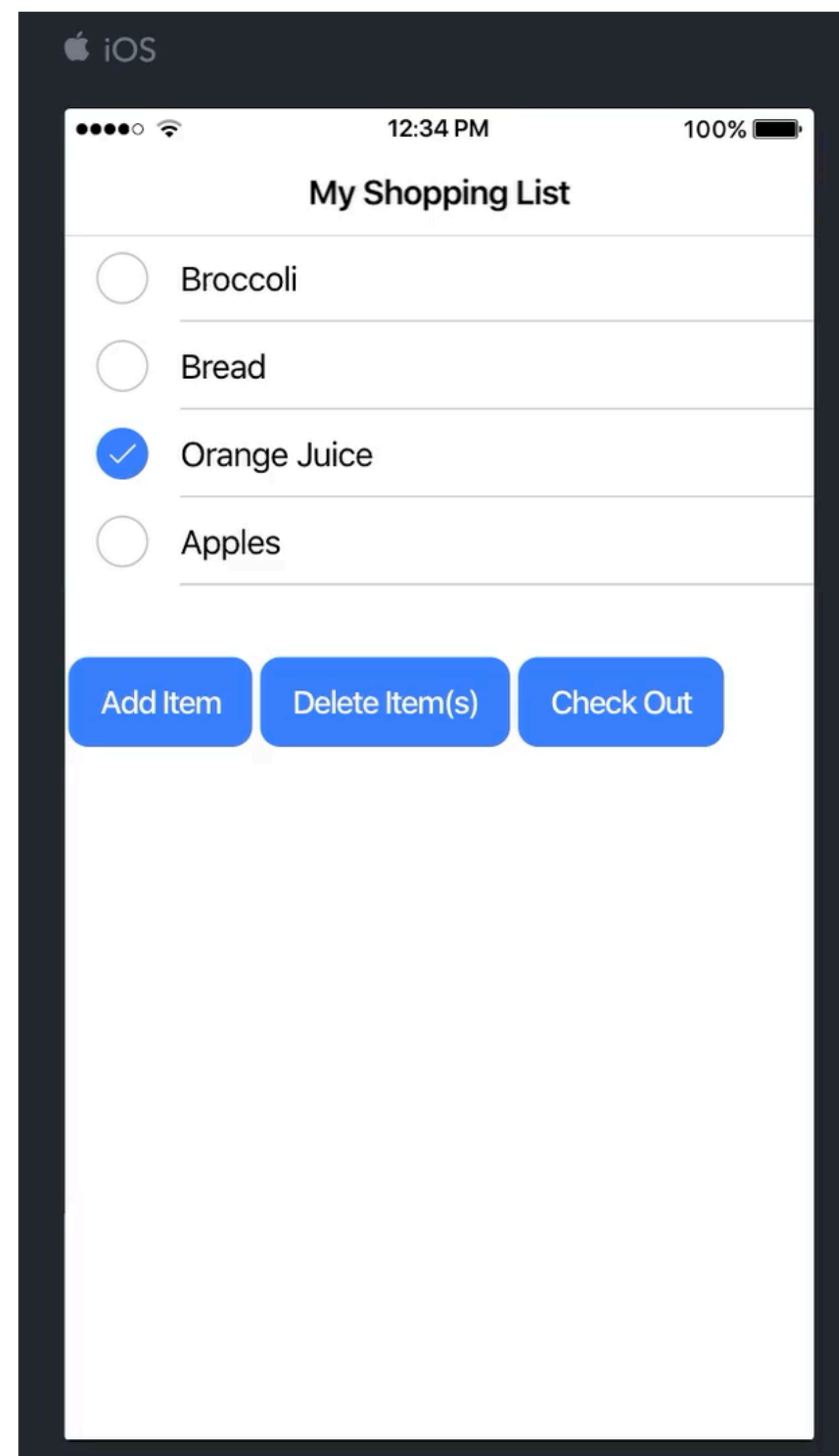
```
/*modal-page.ts*/
@Input() name:string;

constructor(public
modalController:ModalController) { }

dismiss() {
    this.modalController.dismiss('Hello from
modal!');
}
```

```
/*home-page.ts, creates ModalPage*/
presentModal() {
    this.modalController.create({
        component: ModalPage,
        componentProps: {name: "IN4MATX 133"}
    }).then((modal) => {
        modal.present();
        modal.onDidDismiss().then((data)=>{
            console.log(data);
            // "Hello from modal!"
        })
    });
}
```

Modals



Question



How confident are you that
you'll be able to use Ionic's components?

- ☐ A I have a lot of questions about how to use them
- ☐ B I have a few questions about how to use them
- ☐ C I'm still digesting the information, check in again later
- ☐ D I think I can figure it out once I start
- ☐ E I'm confident I'll be able to use them

Routing

Routing

- Like in Angular, `app.routing.module.ts` defines URL routes
- But there's no browser bar in your app...

```
const routes: Routes = [  
  { path: '', redirectTo: 'home', pathMatch: 'full' },  
  { path: 'home', loadChildren: './home/home.module#HomePageModule' },  
  { path: 'modal', loadChildren: './modal/modal.module#ModalPageModule' },  
  { path: 'page2', loadChildren: './page2/page2.module#Page2PageModule' }  
];
```

Routing

Method 1: defining an href attribute

```
<ion-content padding >  
  <ion-button href="page2">Go to page 2</ion-button>  
</ion-content>
```



Routing

Method 2: using NavController

```
<ion-content padding >
  <ion-button (click)="goToPage2()">Go to page 2</ion-button>
</ion-content>
/* .ts */
import { NavController } from '@ionic/angular';

export class HomePage {
  constructor(public navCtrl: NavController) {}

  goToPage2() {
    this.navCtrl.navigateForward('/page2');
  }
}
```



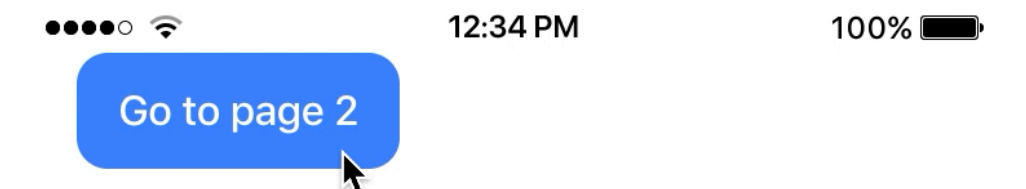
- ... but supporting undo is important to mobile app design

Routing

Supporting Undo

```
import { NavController } from '@ionic/angular';
export class Page2Page implements OnInit {
  constructor(public navCtrl: NavController) { }
  back() {
    this.navCtrl.back();
  }
}
```

```
<ion-header>
  <ion-toolbar>
    <ion-buttons slot="start">
      <ion-back-button (click)="back()"></ion-back-button>
    </ion-buttons>
    <ion-title>page2</ion-title>
  </ion-toolbar>
</ion-header>
<ion-content padding>
  On page 2
</ion-content>
```



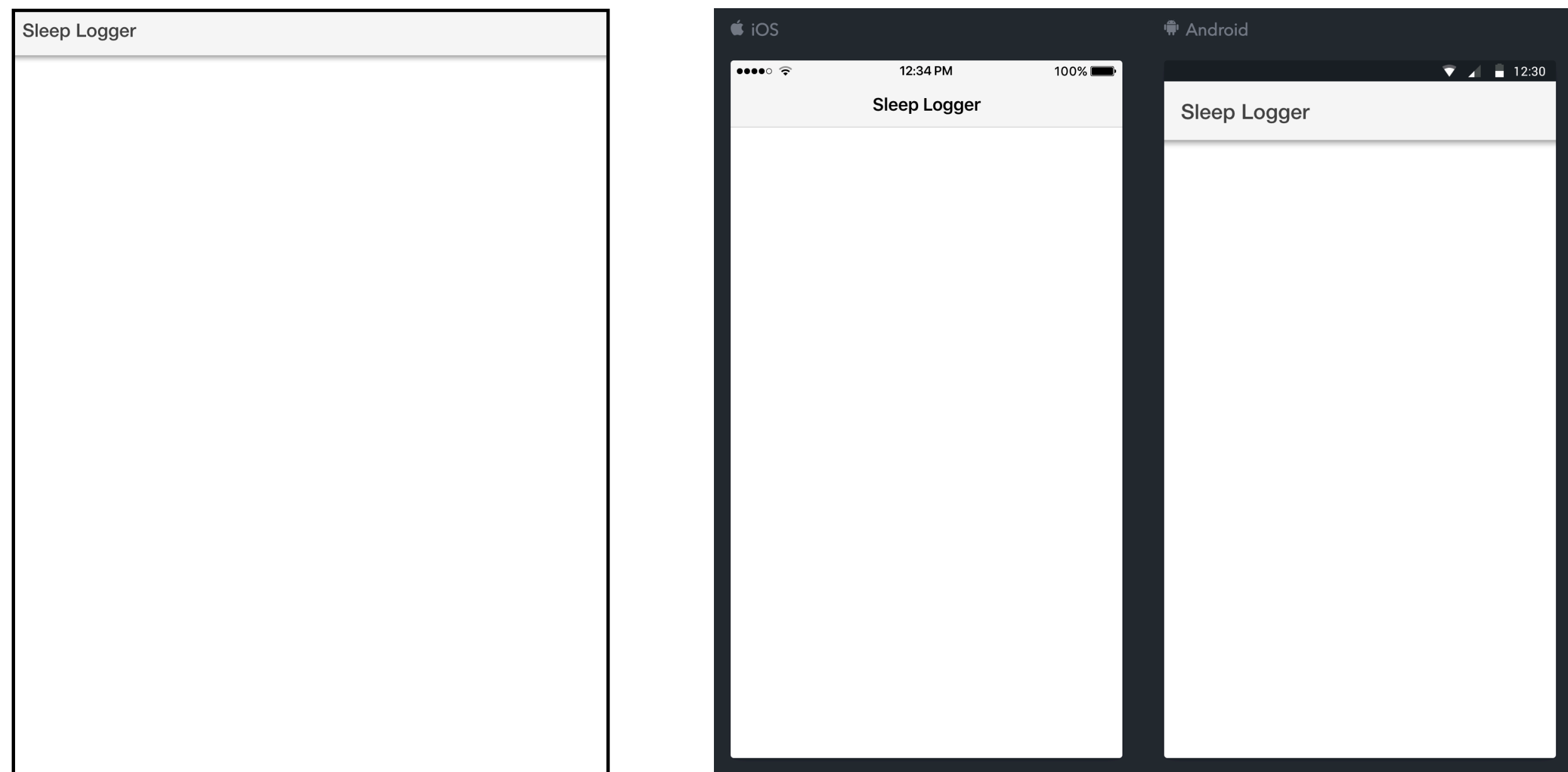
Ionic Setup

Ionic Setup

- `npm install -g @ionic/cli`
- `ionic start [projectname]`
- `cd [projectname]`
- `ionic generate [page/component/class] [filename]`

Ionic Serve & Lab

- Run app in your browser with `ionic serve` or `ionic lab`
 - `serve` (left) renders app as it would appear in a browser
 - `lab` (right, recommended) renders iOS and Android views of the app



Today's goals

By the end of today, you should be able to...

- Use Ionic Components to make a mobile-friendly app
 - Display structured content with items and lists
 - Style content with colors, icons, and badges
 - Receive user input with inputs and modals
- Use routing to move between pages of your Ionic app

IN4MATX 133: User Interface Software

Lecture 13:
Ionic Components

Professor Daniel A. Epstein
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