Tab and Flyout Navigations

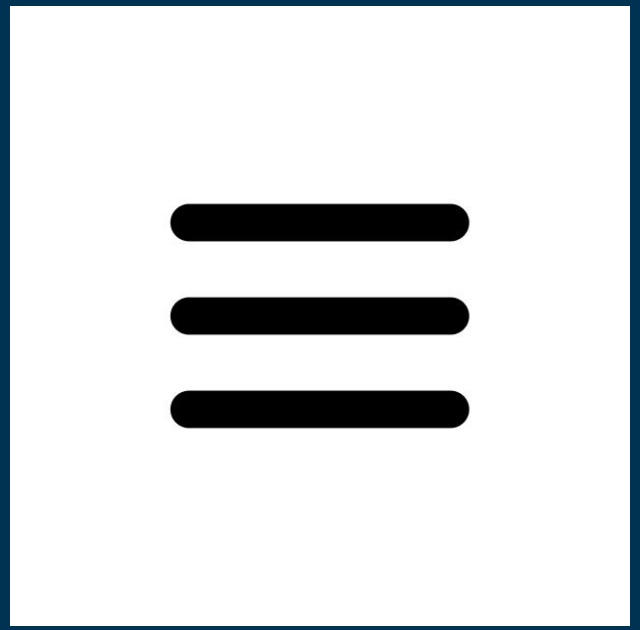
Introduction

- Part of planning your app's architecture is deciding how the user moves between pages:
  - Should users go forward and backward through a sequence of pages?
  - Does your app have one start page, or are there several top-level pages that are equally important?

- Your choice of navigation must work well with your app's content.
- It should also feel native to each platform you target.

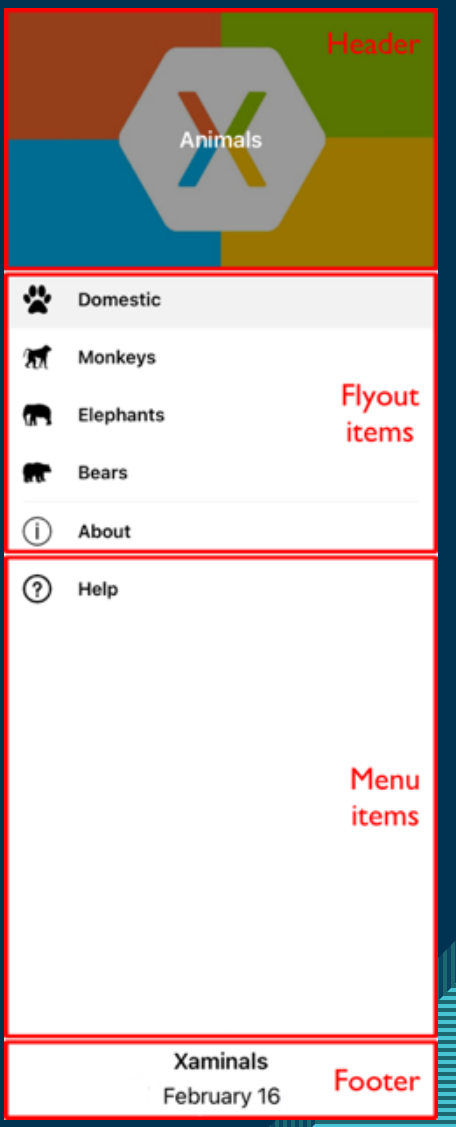
Flyout Navigation

- Flyout navigation is a type of navigation where a window of menu items slides (or flies out) from the side of the device's screen.
- It's invoked by tapping on what's called a hamburger menu, or an icon with three horizontal lines stacked on top of each other.



Flyout Navigation

- The flyout menu is composed of several parts:
  - Header
  - FlyoutItems
  - MenuItems
  - Footer



- Because the flyout menu isn't always visible, it can be used to switch context between conceptually different parts of your application.
- For example, one flyout item can lead to a data entry page, and another to an about page.

Flyout Navigation in a .NET MAUI App

- You use the `FlyoutItem` class to implement flyout navigation in .NET MAUI.
- Navigation with a flyout in .NET MAUI occurs when a `FlyoutItem` item is tapped.
- You specify what gets displayed when a `FlyoutItem` is tapped by setting its `ShellContent` property.
- That property points to a page in your application.
- The `FlyoutItem` needs to be hosted in a `Shell` page, which serves as your application's main page.
- And you can have as many `FlyoutItems` as you'd like.

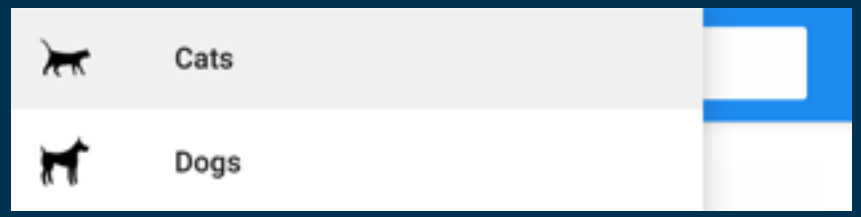
Flyout Navigation in a .NET MAUI App

- The following example creates a flyout menu containing two flyout items:

```
<Shell xmlns="http://schemas.microsoft.com/dotnet/2021/maui"
       xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
       xmlns:controls="clr-namespace:Xaminals.Controls"
       xmlns:views="clr-namespace:Xaminals.Views"
       x:Class="Xaminals.AppShell">

    <FlyoutItem Title="Cats"
                Icon="cat.png">
       <Tab>
           <ShellContent ContentTemplate="{DataTemplate views:CatsPage}" />
       </Tab>
    </FlyoutItem>
    <FlyoutItem Title="Dogs"
                Icon="dog.png">
       <Tab>
           <ShellContent ContentTemplate="{DataTemplate views:DogsPage}" />
       </Tab>
    </FlyoutItem>
</Shell>
```

Simplify the XAML Code

- A `FlyoutItem` object represents each flyout item.
- Each `FlyoutItem` object should be a child of the subclassed `Shell` object that serves as your app's `MainPage`.
- The `Shell` object has implicit conversion operators that enable the Shell visual hierarchy to be simplified.
- This simplification is possible because a subclassed `Shell` object can only ever contain `FlyoutItem` objects or a `TabBar` object, which can only ever contain `Tab` objects, which can only ever contain `ShellContent` objects.
- These implicit conversion operators can be used to remove the `FlyoutItem` and `Tab` objects from the previous example.




```
<Shell xmlns="http://schemas.microsoft.com/dotnet/2021/maui"
       xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
       xmlns:controls="clr-namespace:Xaminals.Controls"
       xmlns:views="clr-namespace:Xaminals.Views"
       x:Class="Xaminals.AppShell">
   <ShellContent Title="Cats"
                 Icon="cat.png"
                 ContentTemplate="{DataTemplate views:CatsPage}" />
   <ShellContent Title="Dogs"
                 Icon="dog.png"
                 ContentTemplate="{DataTemplate views:DogsPage}" />
</Shell>
```

Exercise

- In the sample scenario, you have a MAUI app that contains pages for displaying information about astronomical bodies, the phases of the moon, and sunrise/sunset times.
- The app also includes an About page.
- Currently, these pages are all stand-alone, but you want to provide a logical way for the user to move between them.
- In this exercise, you add flyout navigation to the app.

- This exercise uses the .NET 8.0 SDK.
  - Ensure that you have .NET 8.0 installed.

- Clone or download the exercise repo from Github:
  - https://github.com/MicrosoftDocs/mslearn-dotnetmaui-create-multi-page-apps

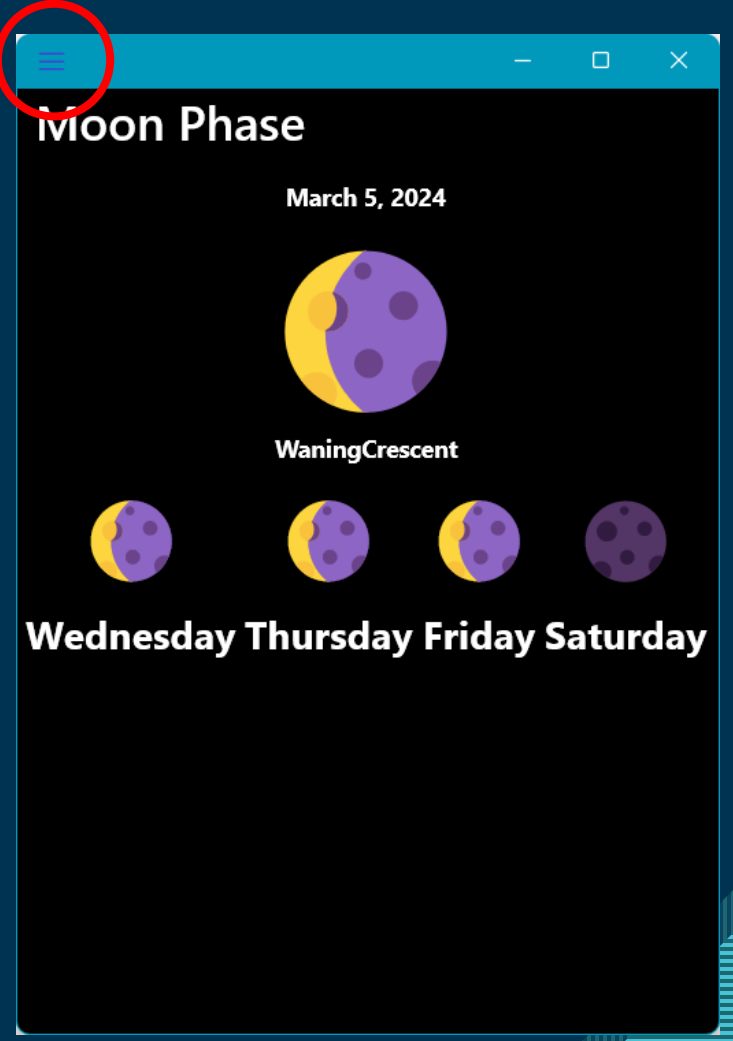
Exercise

- Go to the exercise1 folder in the cloned repo, and then move to the start folder.
- Use Visual Studio to open the Astronomy.sln solution.
- In the Solution Explorer window, in the Astronomy project, expand the Pages folder.
- This folder contains the following pages:
  - AboutPage: This page displays about information for the app.
  - MoonPhasePage: This page displays specific information about the phases of the Moon as seen from Earth.
  - SunrisePage: This page displays sunrise and sunset times for locations on Earth.
    - The data is provided by the Sunrise Sunset web service.
- Build and run the app.
- When the app starts, the MoonPhasePage displays, but currently there's no means provided to enable the user to navigate to the other pages.
- Close the app and return to Visual Studio.

Exercise: Add Flyout Navigation

- In the Solutions Explorer window, open up the AppShell.xaml page.
- In the XAML markup editor, surround the existing `<ShellContent>` item with a `<FlyoutItem>`. Set the `Title` property of the `<Flyout>` item to be Moon Phase. The markup should look like this:

```
<FlyoutItem Title="Moon Phase">
    <ShellContent
        ContentTemplate="{DataTemplate local:MoonPhasePage}"/>
</FlyoutItem>
```

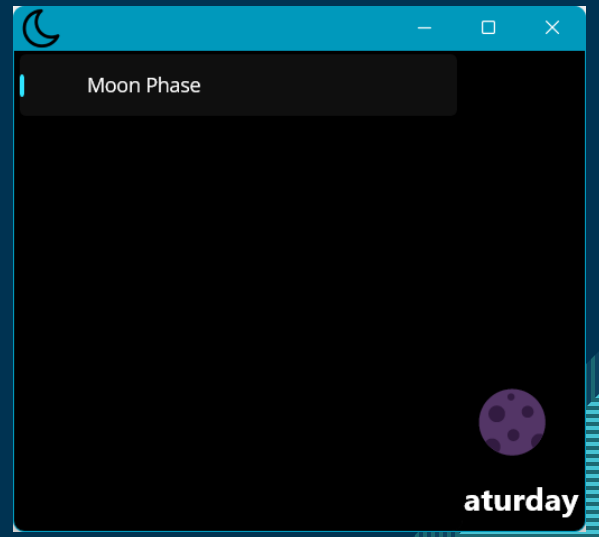


Exercise: Add Flyout Navigation

- Add a `FlyoutIcon` property to the `<Shell>` node to display an image.
- By default, it displays three horizontal bars, but we can change it to be whatever we like. The markup should look like this:

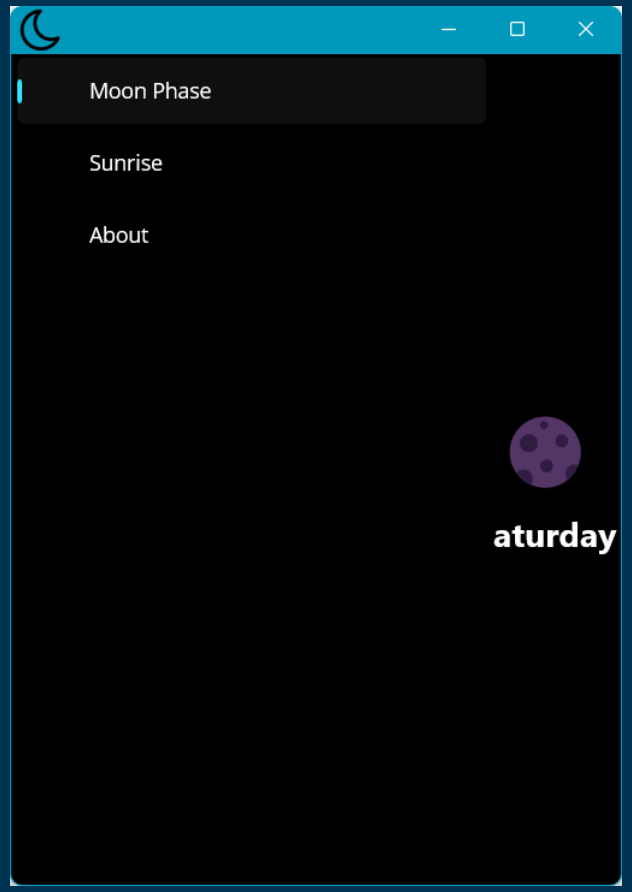
```
<Shell
    x:Class="Astronomy.AppShell"
    xmlns="http://schemas.microsoft.com/dotnet/2021/maui"
    xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
    xmlns:local="clr-namespace:Astronomy.Pages"
    FlyoutIcon="moon.png">
```

- Run the application. You should now see a moon image in the upper left corner of the app.
- Tap on the icon and the flyout appears.



Exercise: Add Flyout Navigation

- Now add in more flyout options.
- Create a new `<FlyoutItem>` below the one you just made and set its `Title` to Sunrise.
- Its `ShellContent` should point to the SunrisePage page.
- Add another `<FlyoutItem>`, set its `Title` to About. This time set the `ShellContent` to AboutPage.

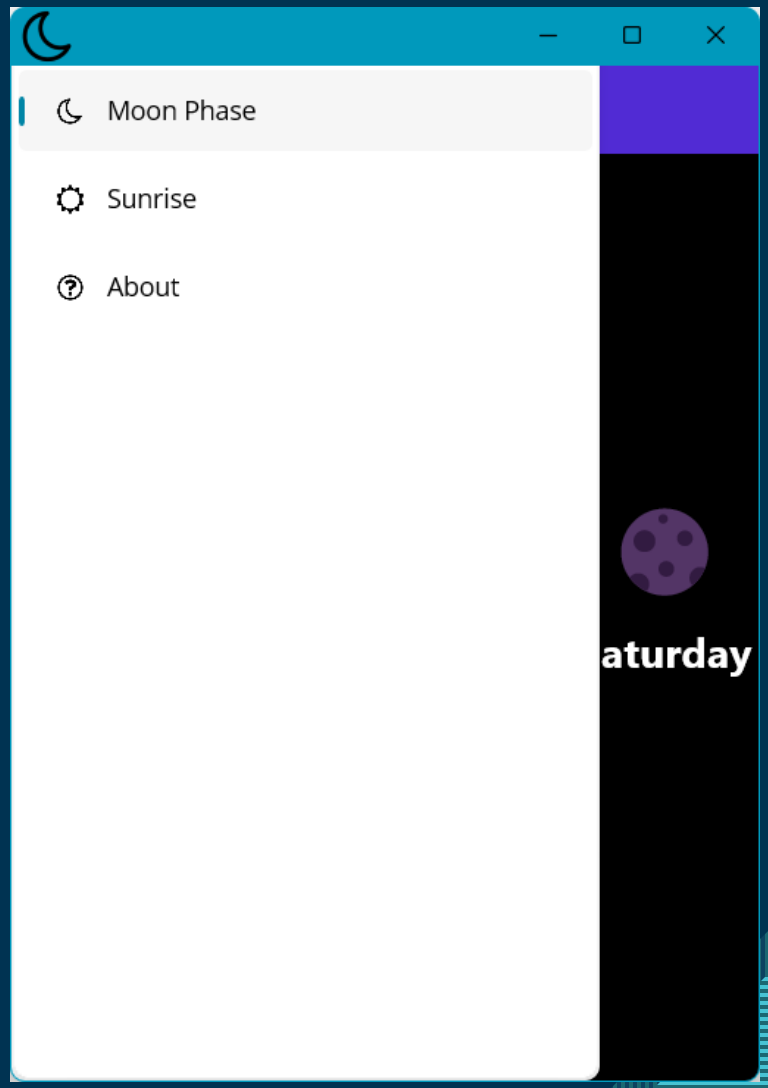



```
<FlyoutItem Title="Sunrise">
    <ShellContent
        ContentTemplate="{DataTemplate local:SunrisePage}"/>
</FlyoutItem>

<FlyoutItem Title="About">
    <ShellContent
        ContentTemplate="{DataTemplate local:AboutPage}"/>
</FlyoutItem>
```

Exercise: Adding Icons

- You might have noticed the flyout items look a bit empty.
- You can add icons to the flyout items by using the `Icon` property.
- Some images have already been added to the Resources\Images folder for you to use.
- Set the `Icon` property of the first `FlyoutItem` to moon.png.
- Repeat for the other 2 flyout items, using sun.png and question.png respectively.

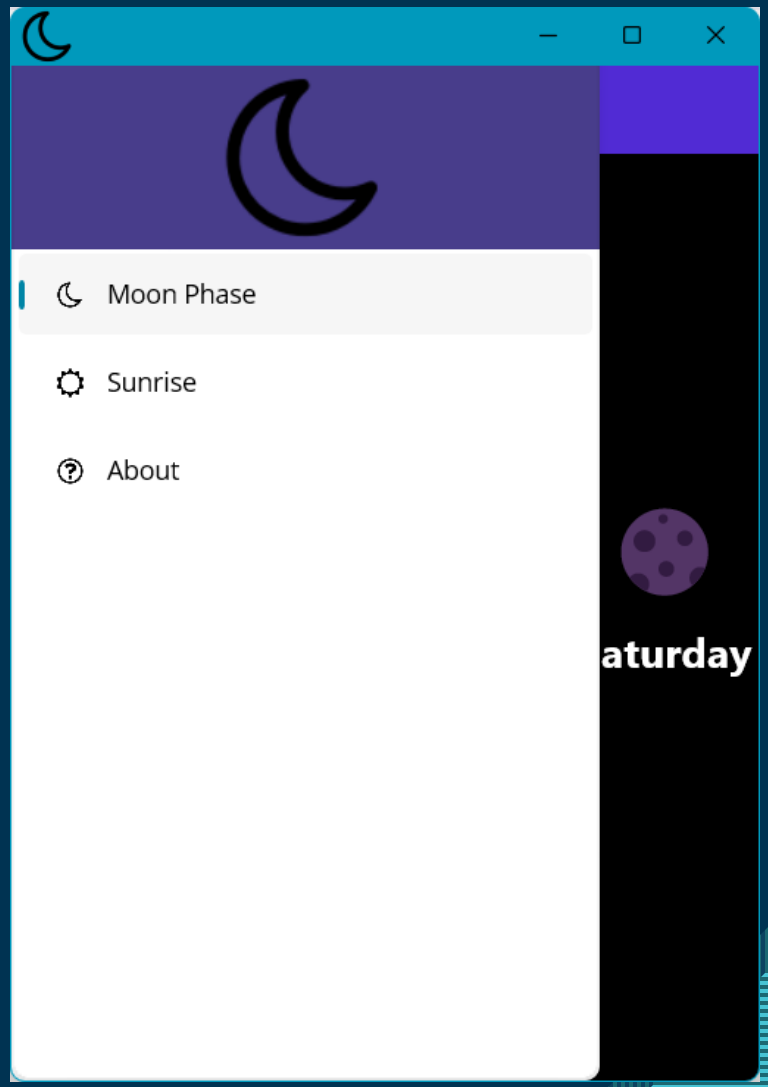
```
<FlyoutItem Title="Moon Phase" Icon="moon.png">
    <ShellContent
        ContentTemplate="{DataTemplate local:MoonPhasePage}" />
</FlyoutItem>

<FlyoutItem Title="Sunrise" Icon="sun.png">
    <ShellContent
        ContentTemplate="{DataTemplate local:SunrisePage}"/>
</FlyoutItem>

<FlyoutItem Title="About" Icon="question.png">
    <ShellContent
        ContentTemplate="{DataTemplate local:AboutPage}"/>
</FlyoutItem>
```



Exercise: Add a Flyout Header

- The flyout items are at the top of the flyout menu, making them difficult to distinguish.
- We can add some space to the top, and even an entire `View` by using the `<Shell.FlyoutHeader>`.
- Add a flyout header as a child of the `<Shell>` node.

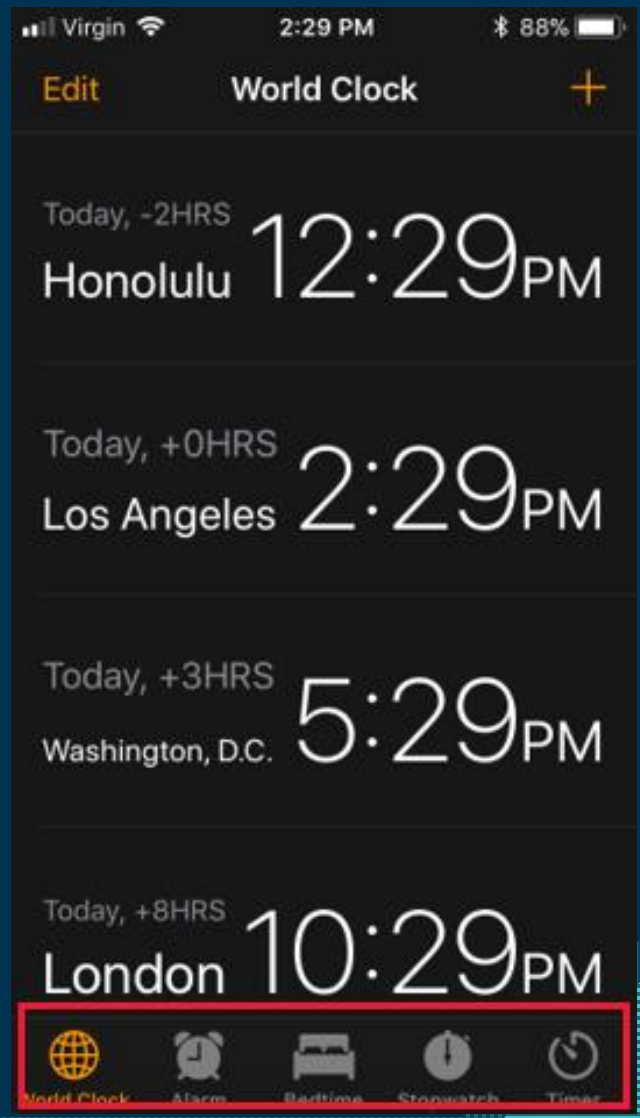
```
<Shell
    x:Class="Astronomy.AppShell"
    xmlns="http://schemas.microsoft.com/dotnet/2021/maui"
    xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
    xmlns:local="clr-namespace:Astronomy.Pages"
    FlyoutIcon="moon.png">

    <Shell.FlyoutHeader>
        <Grid HeightRequest="100" BackgroundColor="DarkSlateBlue">
            <Image Source="moon.png" />
        </Grid>
    </Shell.FlyoutHeader>

    <FlyoutItem Title="Moon Phase" Icon="moon.png">
        <ShellContent
        ContentTemplate="{DataTemplate local:MoonPhasePage}" />
    </FlyoutItem>
```



Tab Navigation

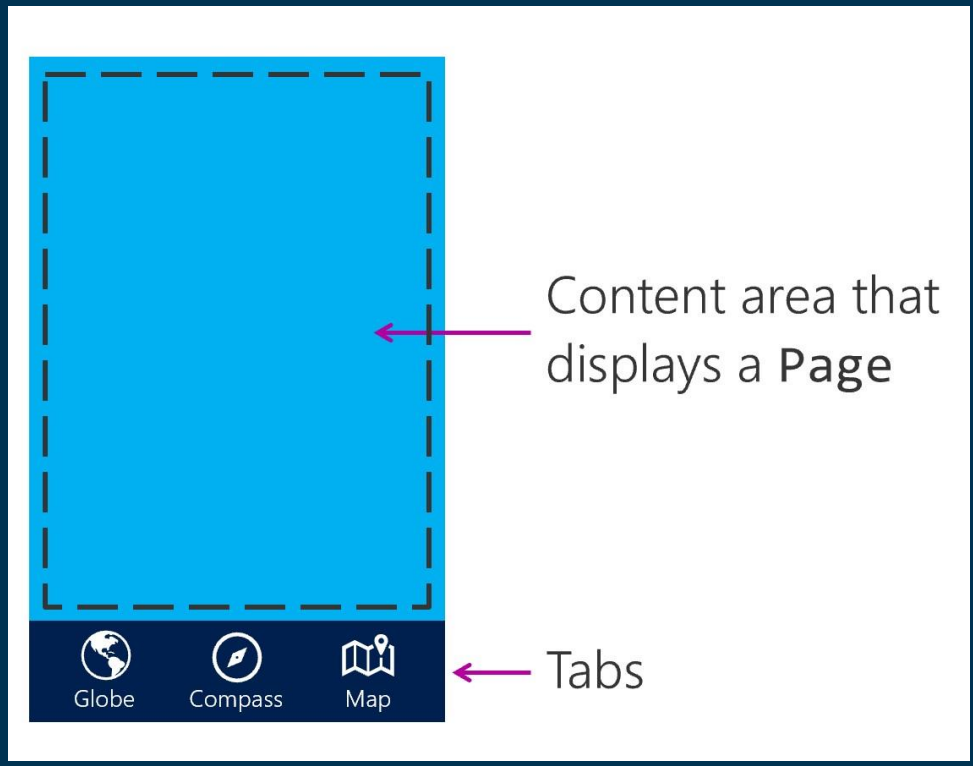
- Tab navigation is a navigation pattern where a tab strip (a row of touchable controls) is permanently displayed at the top or bottom of the screen.
- Tab navigation provides a mechanism for a user to select between pages in a multi-page app.
- As an example, this illustration shows the use of tab navigation in the iOS Clock app.
- The icons highlighted at the base of the page, enable you to switch between different views.

- Tab navigation is ideal when an application has several sections that a user is likely to use frequently.
- Clock applications are an excellent example.
- The clock, alarm, and stopwatch sections are likely to be frequently used.



Tab Navigation in a .NET MAUI App

- You use the `TabBar` object to implement tab navigation in a .NET MAUI shell app.
- The `TabBar` object displays a set of tabs and automatically switches the displayed content when the user selects a tab.
- To use tabs in a .NET MAUI Shell application, create an instance of the `TabBar` class as a child of the `Shell` class.
- Then add `Tab` objects to the `TabBar`.
- Within the `Tab` object, a `ShellContent` object should be set to a `ContentPage` object.



Create a TabbedPage

- You can create a `TabBar` instance as a child of the `Shell` class.
- Add `Tab` objects as children to the `TabBar` as needed.
- Within the `Tab` object, a `ShellContent` object should be set to a `ContentPage` object.

```
<Shell xmlns="http://schemas.microsoft.com/dotnet/2021/maui"
       xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
       xmlns:views="clr-namespace:Xaminals.Views"
       x:Class="Xaminals.AppShell">
    <TabBar>
       <Tab Title="Moon Phase"
            Icon="moon.png">
           <ShellContent ContentTemplate="{DataTemplate local:MoonPhasePage}" />
       </Tab>
       <Tab Title="Sunrise"
            Icon="sun.png">
           <ShellContent ContentTemplate="{DataTemplate local:SunrisePage}" />
       </Tab>
    </TabBar>
</Shell>
```

Exercise

- In the astronomy app, you've been asked to combine tabs with the flyout to help with navigation between the different pages.
- The first thing you decide to do is remove all the pages from the flyout and add them to a `TabBar`, so you can see how the app feels.

Exercise: Adding a TabBar

- In the Solution Explorer window, open the AppShell.xaml page.
- In the XAML markup page, delete everything inside of the `<Shell>`.
- Create a `<TabBar>` and an empty `<Tab>`.

```
<Shell
    x:Class="Astronomy.AppShell"
    xmlns="http://schemas.microsoft.com/dotnet/2021/maui"
    xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
    xmlns:local="clr-namespace:Astronomy.Pages"
    FlyoutIcon="moon.png">

    <TabBar>
        <Tab>

        </Tab>
    </TabBar>
</Shell>
```

Exercise: Adding a TabBar

- Next, add a `ShellContent` to the `Tab` and set its content to the `MoonPhasePage`.

```
<TabBar>
    <Tab>
        <ShellContent ContentTemplate="{DataTemplate local:MoonPhasePage}" />
    </Tab>
</TabBar>
```

- Now give the tab a title to be displayed and an icon using the `Title` and `Icon` properties.

```
<TabBar>
    <Tab Title="Moon Phase" Icon="moon.png">
        <ShellContent ContentTemplate="{DataTemplate local:MoonPhasePage}" />
    </Tab>
</TabBar>
```

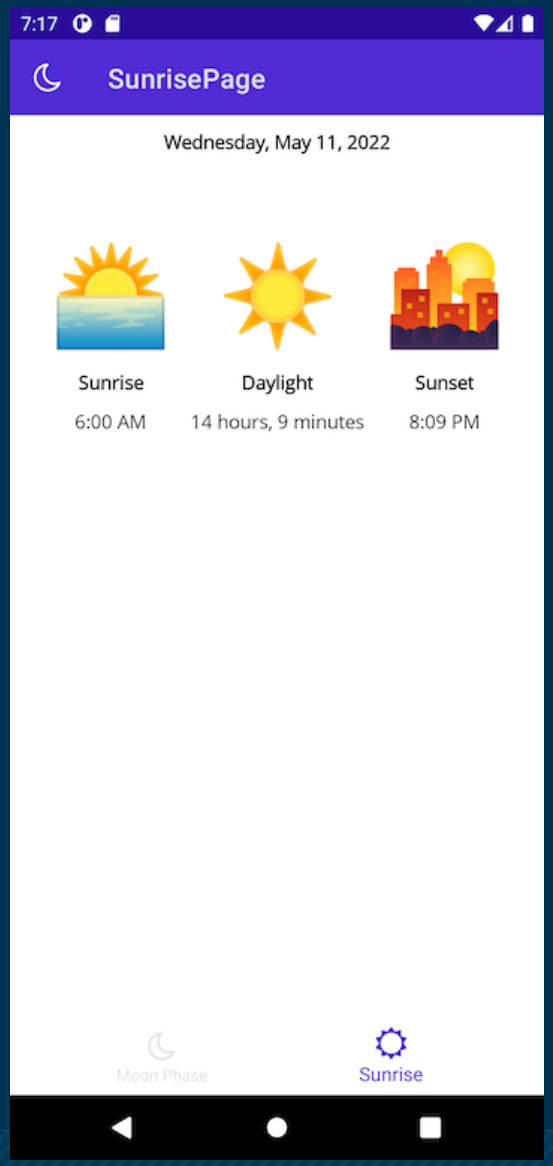
Exercise: Adding a TabBar

- Add in another `Tab` for the `SunrisePage`. Set its `Title` to sunrise and its `Icon` to sun.png.

```
<Shell
    x:Class="Astronomy.AppShell"
    xmlns="http://schemas.microsoft.com/dotnet/2021/maui"
    xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
    xmlns:local="clr-namespace:Astronomy.Pages"
    FlyoutIcon="moon.png">

    <TabBar>
        <Tab Title="Moon Phase" Icon="moon.png">
            <ShellContent ContentTemplate="{DataTemplate local:MoonPhasePage}" />
        </Tab>

        <Tab Title="Sunrise" Icon="sun.png">
            <ShellContent ContentTemplate="{DataTemplate local:SunrisePage}"/>
        </Tab>
    </TabBar>
</Shell>
```

Exercise: Adding a TabBar

- Run the app to see how it looks.



Exercise: Combine Tab Pages with a Flyout

- You decide it makes sense to have the moon phase and sunrise pages in the same tab page.
- And to keep the about page separate.
- So, you decide to add the flyout back in.
- The first flyout item displays the tab page, and the second the about page.

Exercise: Combine Tab Pages with a Flyout

- Delete the `TabBar` and all of the child items contained in it.
- In its place, add in a `<FlyoutItem>`.
- Set its `Title` property to Astronomy and `Icon` to moon.png.

```
<FlyoutItem Title="Astronomy" Icon="moon.png">

</FlyoutItem>
```

- Within the `<FlyoutItem>`, add a `<ShellContent>` that points to the MoonPhasePage.
- Set its `Title` property to Moon Phase and `Icon` property to moon.png.

```
<FlyoutItem Title="Astronomy" Icon="moon.png">
    <ShellContent Title="Moon Phase" Icon="moon.png"
        ContentTemplate="{DataTemplate local:MoonPhasePage}"/>
</FlyoutItem>
```

Exercise: Combine Tab Pages with a Flyout

- Within the same `<FlyoutItem>`, add another `<ShellContent>` to point to the SunrisePage.
- Set its `Title` property to Sunrise and `Icon` property to sun.png.

```
<FlyoutItem Title="Astronomy" Icon="moon.png">
    <ShellContent Title="Moon Phase" Icon="moon.png"
        ContentTemplate="{DataTemplate local:MoonPhasePage}"/>

    <ShellContent Title="Sunrise" Icon="sun.png"
        ContentTemplate="{DataTemplate local:SunrisePage}"/>
</FlyoutItem>
```

- Now, tapping on this flyout item displays a tab page with two tabs.

Exercise: Combine Tab Pages with a Flyout

- To create a new flyout item that points to the AboutPage, add a new `<FlyoutItem>`.
- Set its `Title` property to About and `Icon` property to question.png.
- Within that `<FlyoutItem>`, add a `<ShellContent>` that points to the AboutPage.

```
<FlyoutItem Title="About" Icon="question.png">
    <ShellContent
        ContentTemplate="{DataTemplate local:AboutPage}"/>
</FlyoutItem>
```

- Run the app again.
- You should see two items in the flyout.
- The first one opens up a tab page that contains the MoonPhasePage and SunrisePage.
- The second displays the AboutPage by itself.

Self Learn

- **Navigation Stack:**
  - For hierarchical data, stack navigation enables the user to drill down a series of pages, where the next page in the stack provides a more detailed view of a selected item on the previous page.

- Learn more:
  - https://learn.microsoft.com/en-us/training/modules/create-multi-page-apps/6-use-tabbed-pages-with-navigation-pages
- Exercise:
  - https://learn.microsoft.com/en-us/training/modules/create-multi-page-apps/7-exercise-use-tabbed-pages-with-navigation-pages

Thank You

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References

Material has been taken as is from:

- Microsoft Official Documentation:
  - https://learn.microsoft.com/en-us/training/modules/create-multi-page-apps/