

PV239 - 01 Introduction

Introduction

- Roman
- Ondřej
- And what about you?

Exercises

- Introduction
- Design – XAML
- Architecture – MVVM
- Architecture – IoC/DI
- Storage
- Networking – API
- Topic of your choice

Goals

- Course organization
- Get in touch with .NET MAUI
- Go through environment setup
- Get to know available layouts and controls

Course Organization

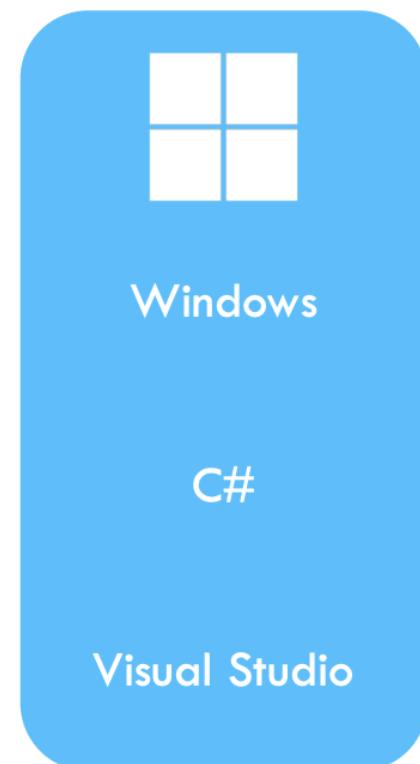
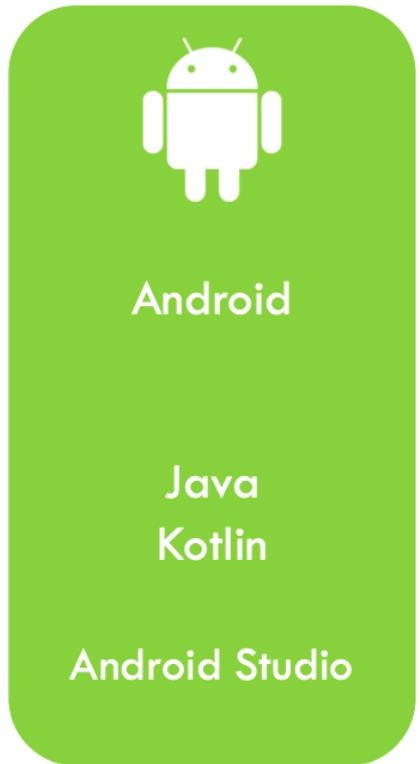
- Interactive syllabi – IS
 - Materials & Resources
 - [Materials repository](#)
 - [Sample app repository](#)
 - Stream/recordings – [Youtube](#)
 - Optional homeworks
 - Project
- [Discord](#)



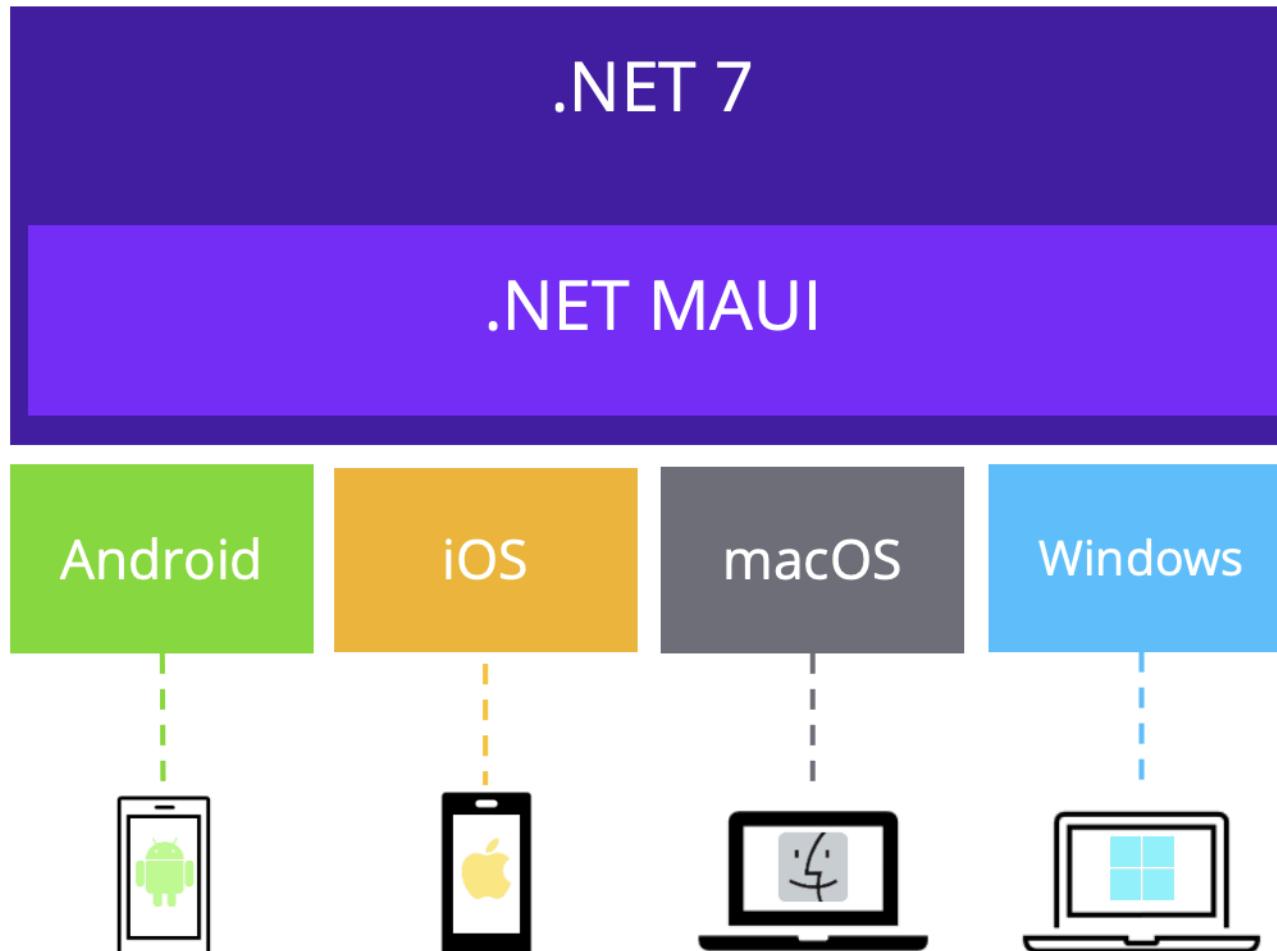
Sample Application

- CookBook
- Android, iOS, Windows
- Communication with API
- Basic CRUD operations
- Saving of settings
- MVVM architecture
- Shell navigation

"Standard" Application Development



.NET Multi-platform App UI



How it Works - Structure

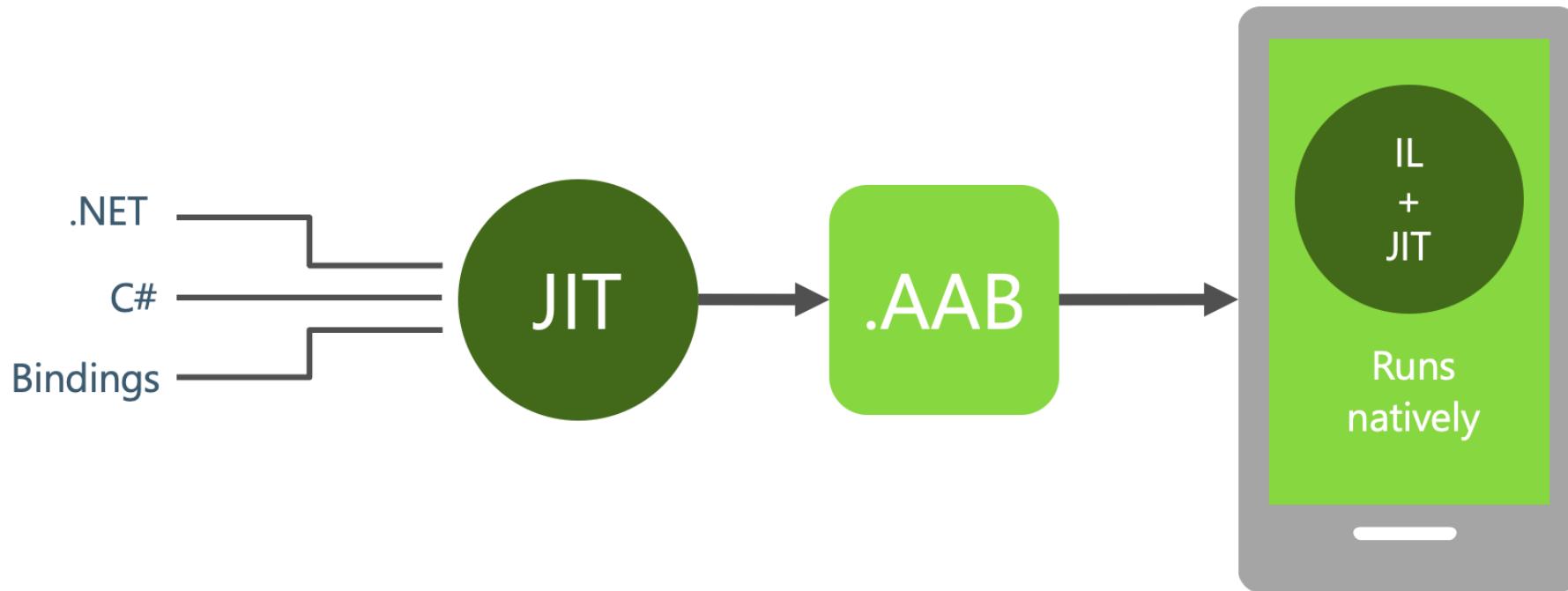
- Platform specific frameworks
 - .NET for Android
 - .NET for iOS
 - .NET for MacOS
- Windows UI (WinUI) library
- Common BCL - .NET
- .NET Runtimes
 - Mono – Android, iOS, MacOS
 - WinRT/Win32 – Windows

How it Works - UI

- Platform specific UI
 - Different platforms - different ways of defining UI
 - Can be defined separately using platform specific APIs
 - .NET for Android, .NET for iOS, .NET for MacOs, WinUI
- Common UI
 - Single framework for defining UI – mobile & desktop
 - XAML

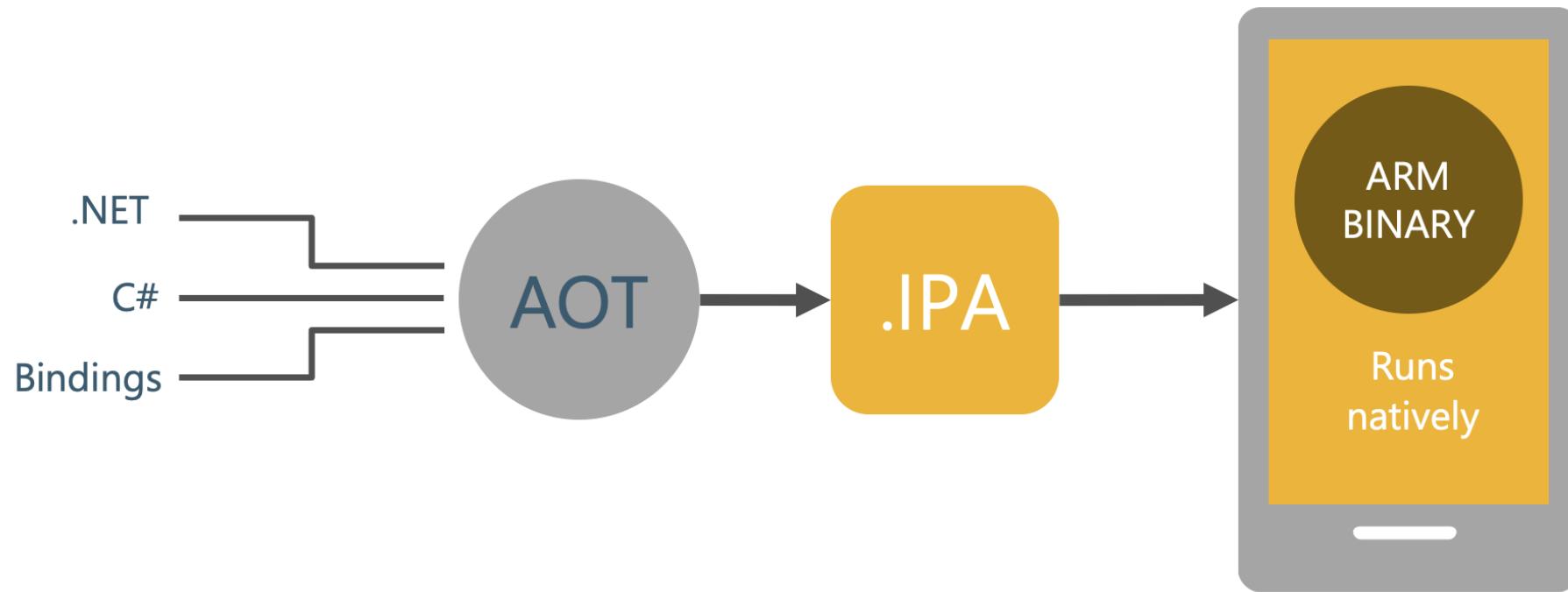
How it Works - Android

- C# compiles to intermediate language (IL)
- IL + JIT in app



How it Works - iOS

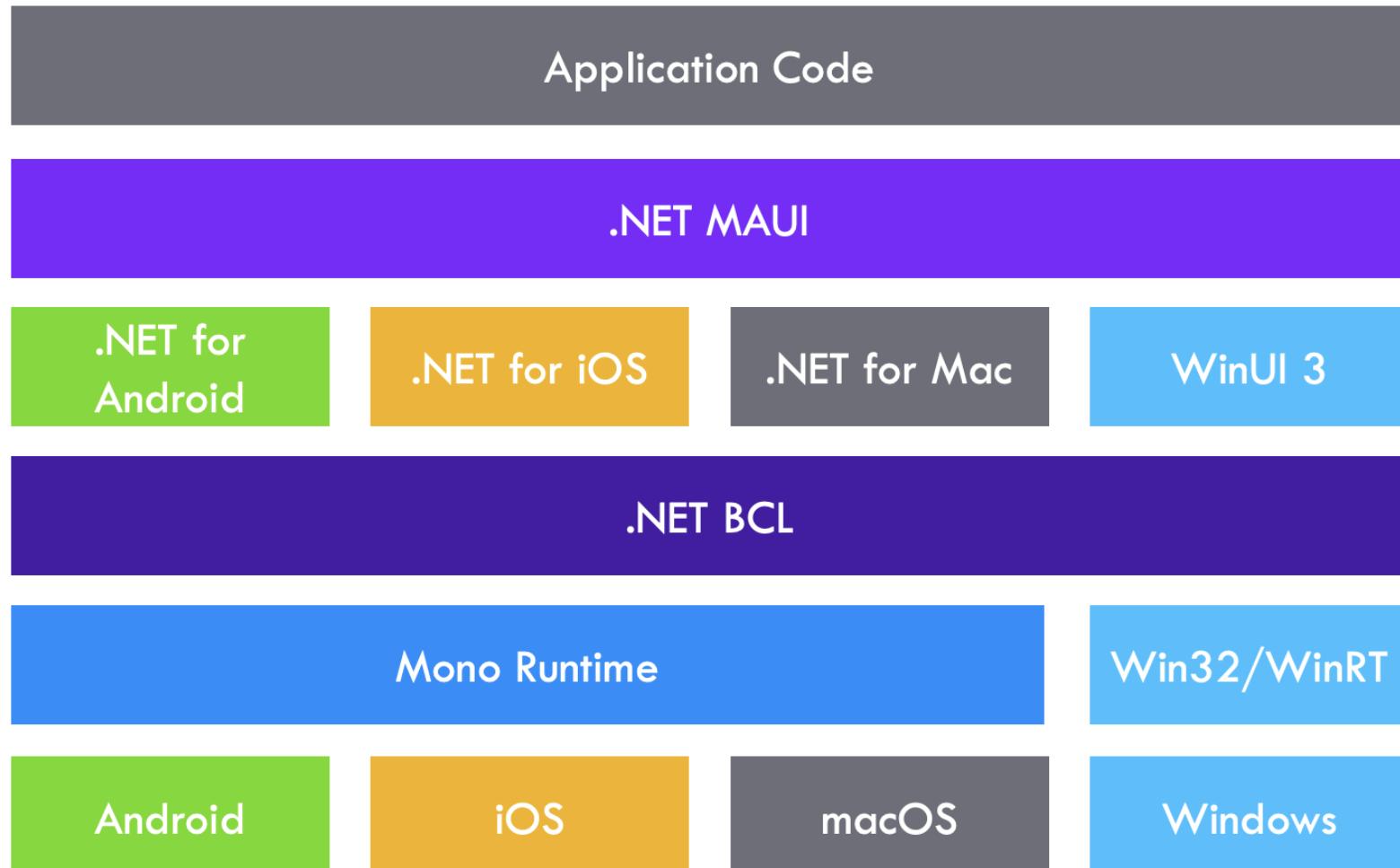
- Fully ahead-of-time (AOT) compiled to native ARM binary



How it Works - macOS & Windows

- MacOS
 - Using Mac Catalyst
 - Apple's solution to bring iOS Apps to desktop
 - Provides access to Mac OS APIs
- Windows
 - WinUI 3 library
 - Native apps and UWP

How .NET MAUI Works



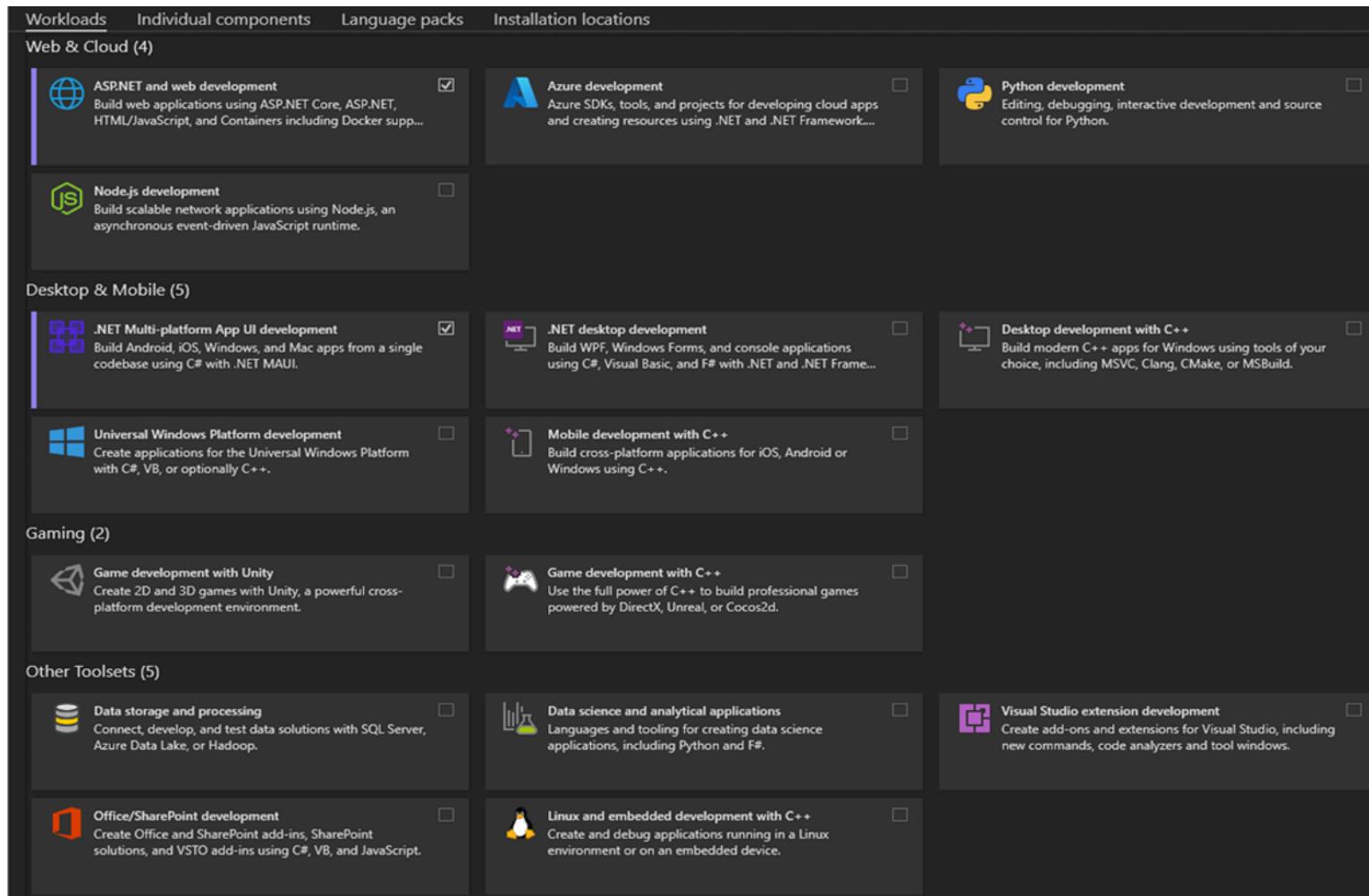
.NET MAUI

- Collection of Controls
- Layout engine for pages
- Navigation – pages, drawers
- Customizable handlers – enable platform specific controls
- APIs for native device features – GPS, accelerometer...
- Graphics library for 2D drawing code
- Single project, multi-targeting system
- .NET hot reload

Setup



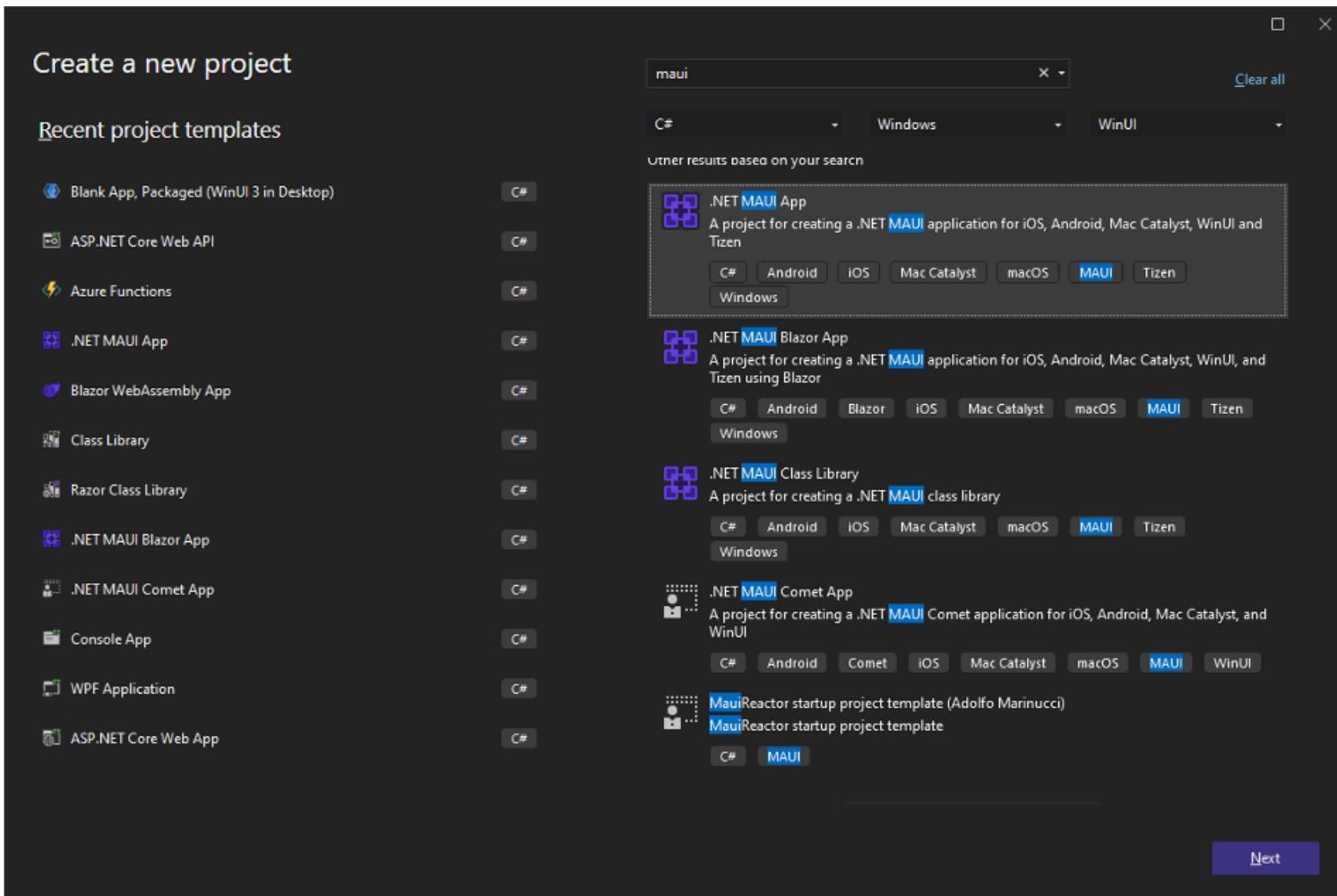
Visual Studio Workloads



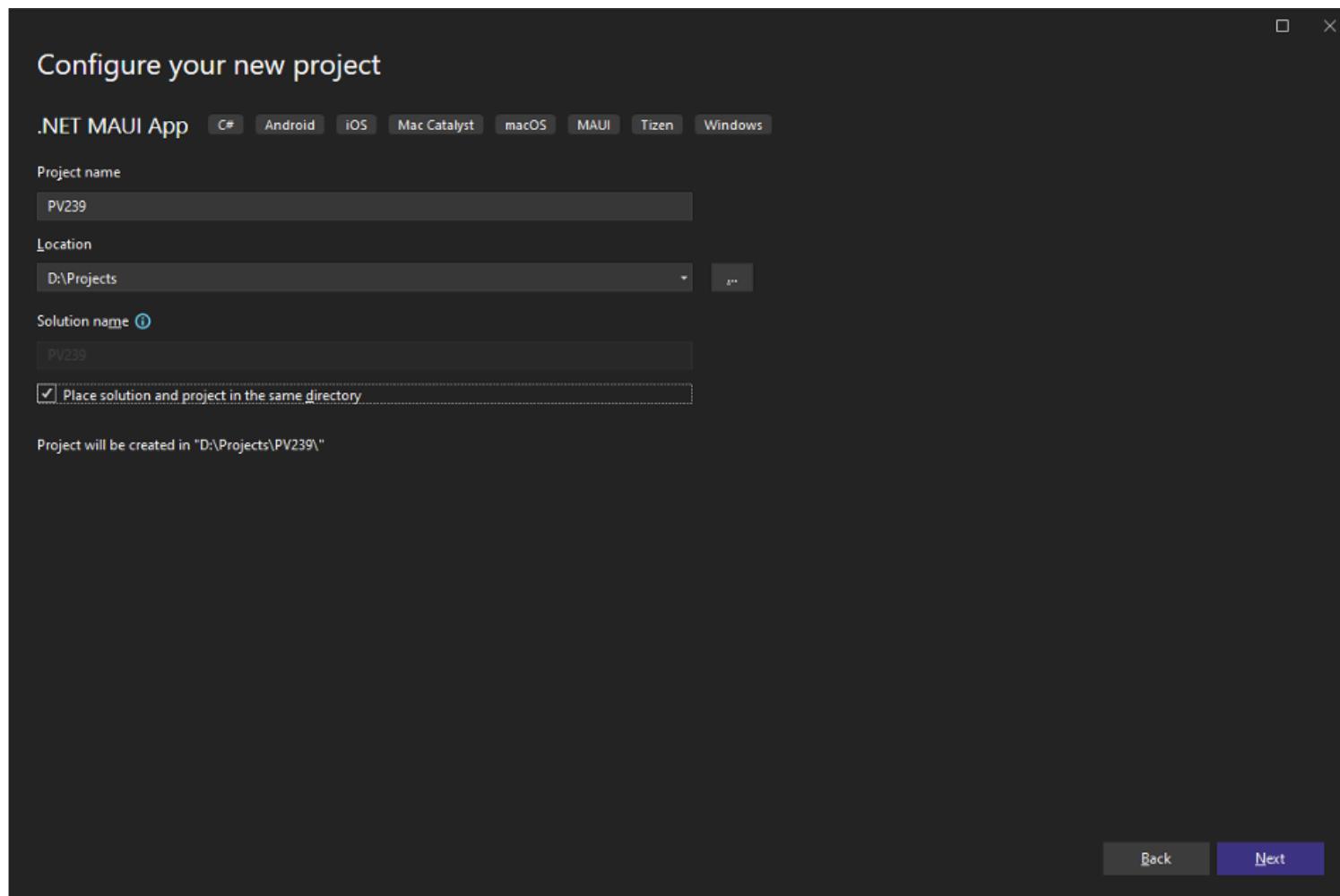
iOS Development

- You need Mac Agent to compile the application
- Compilation runs on a Mac OS device
- Simulator and development can be done on Windows

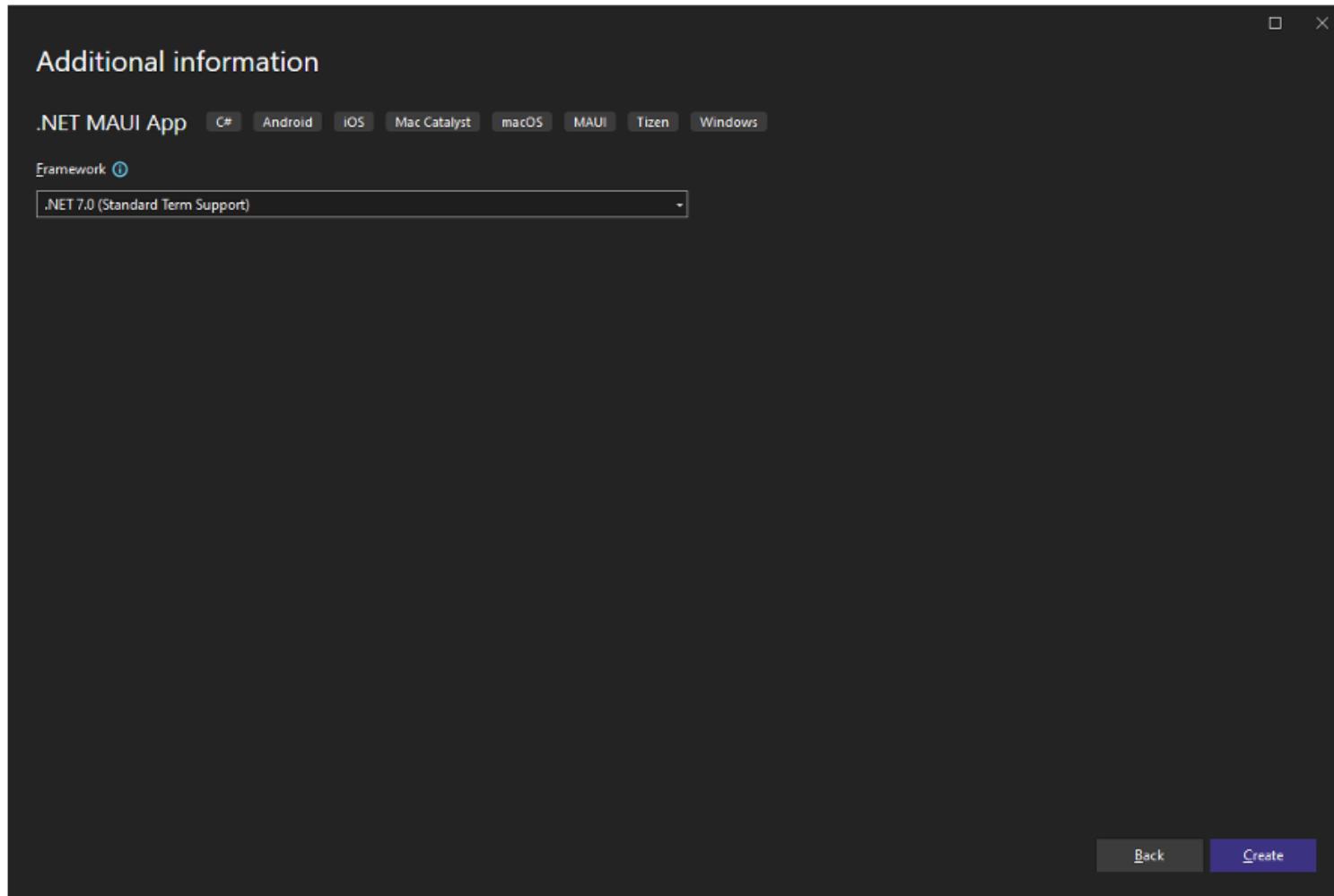
Create a New Project



Create a New Project



Create a New Project



Create a New Project

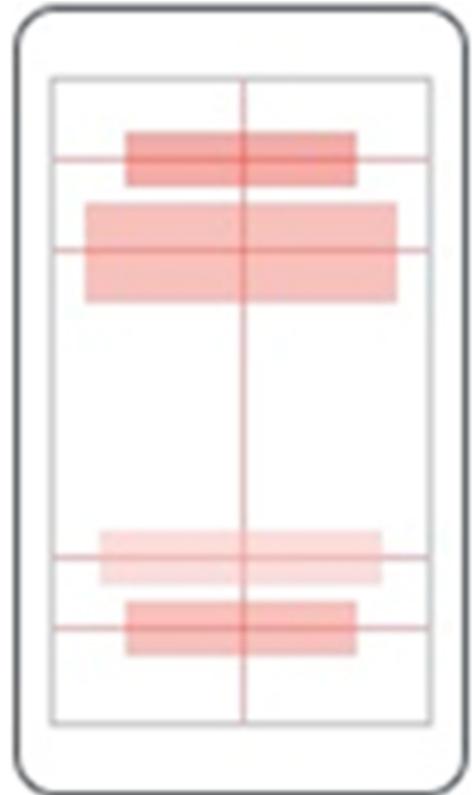
DEMO

Project Structure

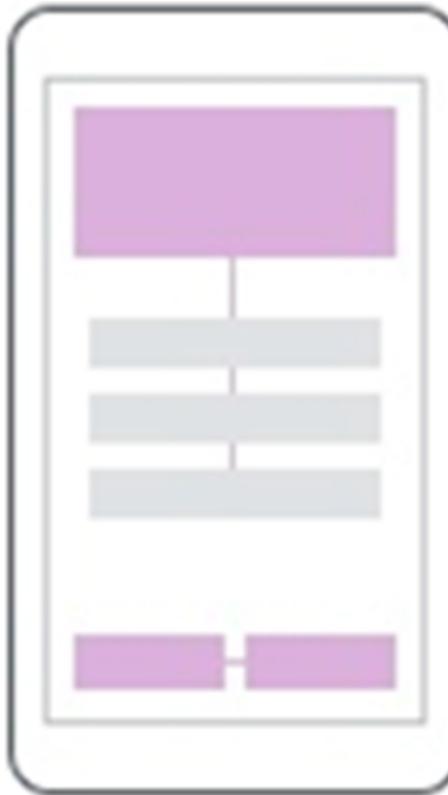
- One project for all platforms
- Shared code & resources (fonts, images, icons, splash screens...)
- Platforms folder:
 - Android – system colors, manifest
 - iOS – launch screen, Info.plist
 - Windows – package manifest, app manifest
 - Mac OS – Info.plist
 - Each platform
 - Application startup point
 - Custom handlers for application specific controls

Layouts

AbsoluteLayout



RelativeLayout

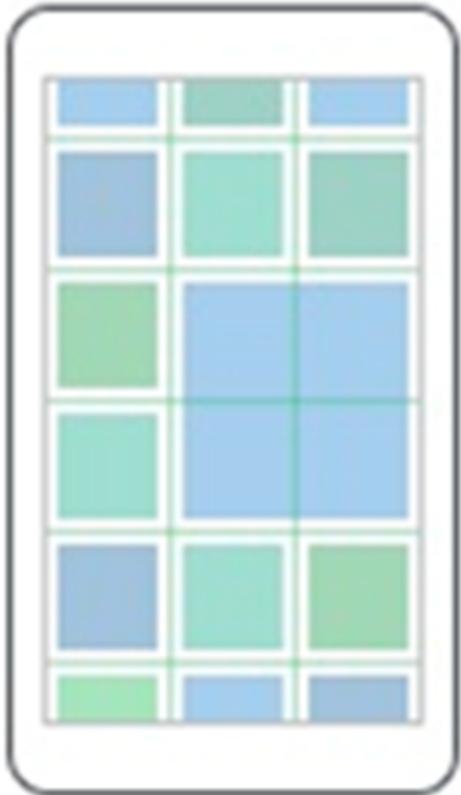


FlexLayout

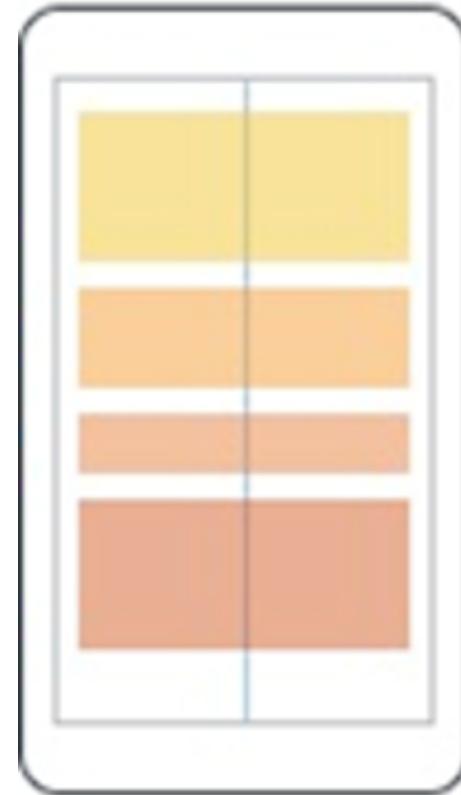


Layouts

Grid

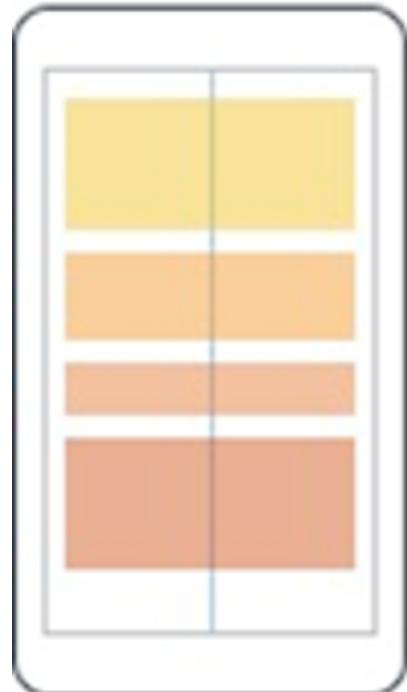


StackLayout

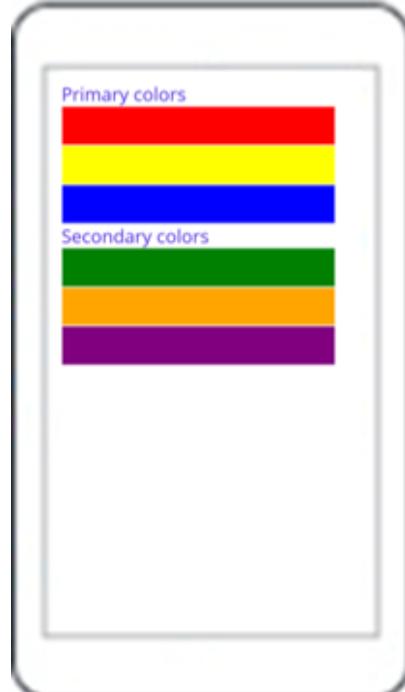


Layouts - StackLayout

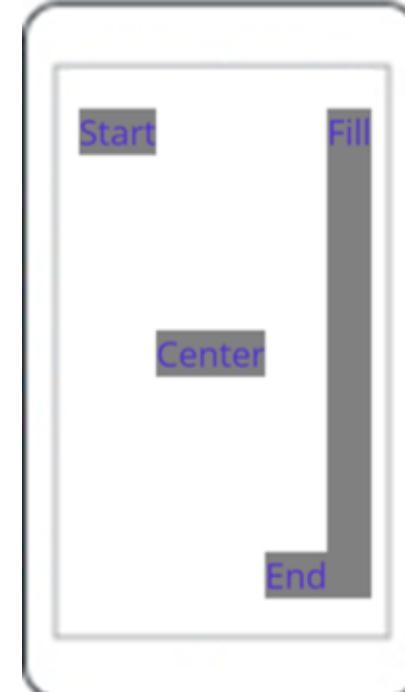
StackLayout



VerticalStackLayout



Horizontal
StackLayout



Grid

- Table-style layout
- RowDefinitions, ColumnDefinitions
 - Width / Height = 150 | * | Auto
- Grid.Row, Grid.Column – placement of control in the Grid
- Grid.RowSpan, Grid.ColumnSpan – control can span over multiple “cells”
- HorizontalSpacing, VerticalSpacing – empty space between “cells”

StackLayout...

- HorizontalStackLayout, VerticalStackLayout
 - Individual layouts for single direction
 - Separate LayoutManagers with Measure methods
 - Recommended
- StackLayout
 - Wraps HorizontalStackLayout and VerticalStackLayout
 - Has Orientation
 - Useful for adaptive layouts

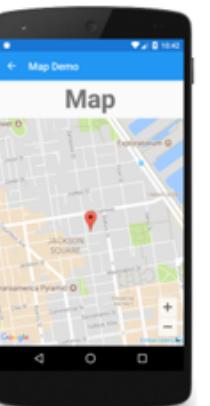
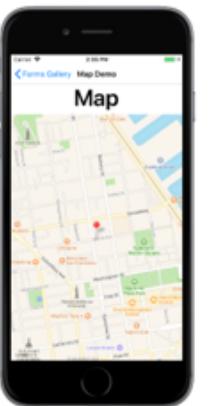
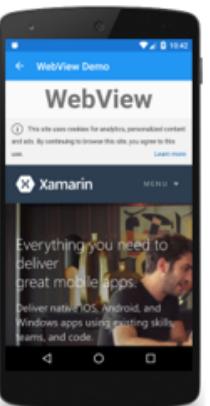
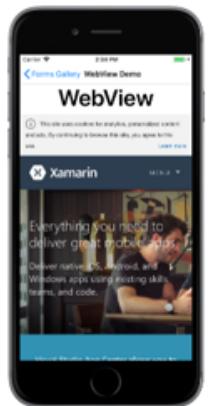
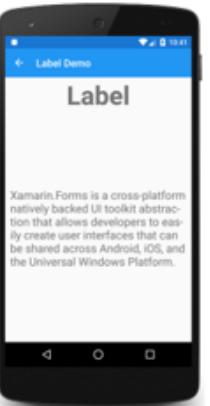
Layouts

DEMO

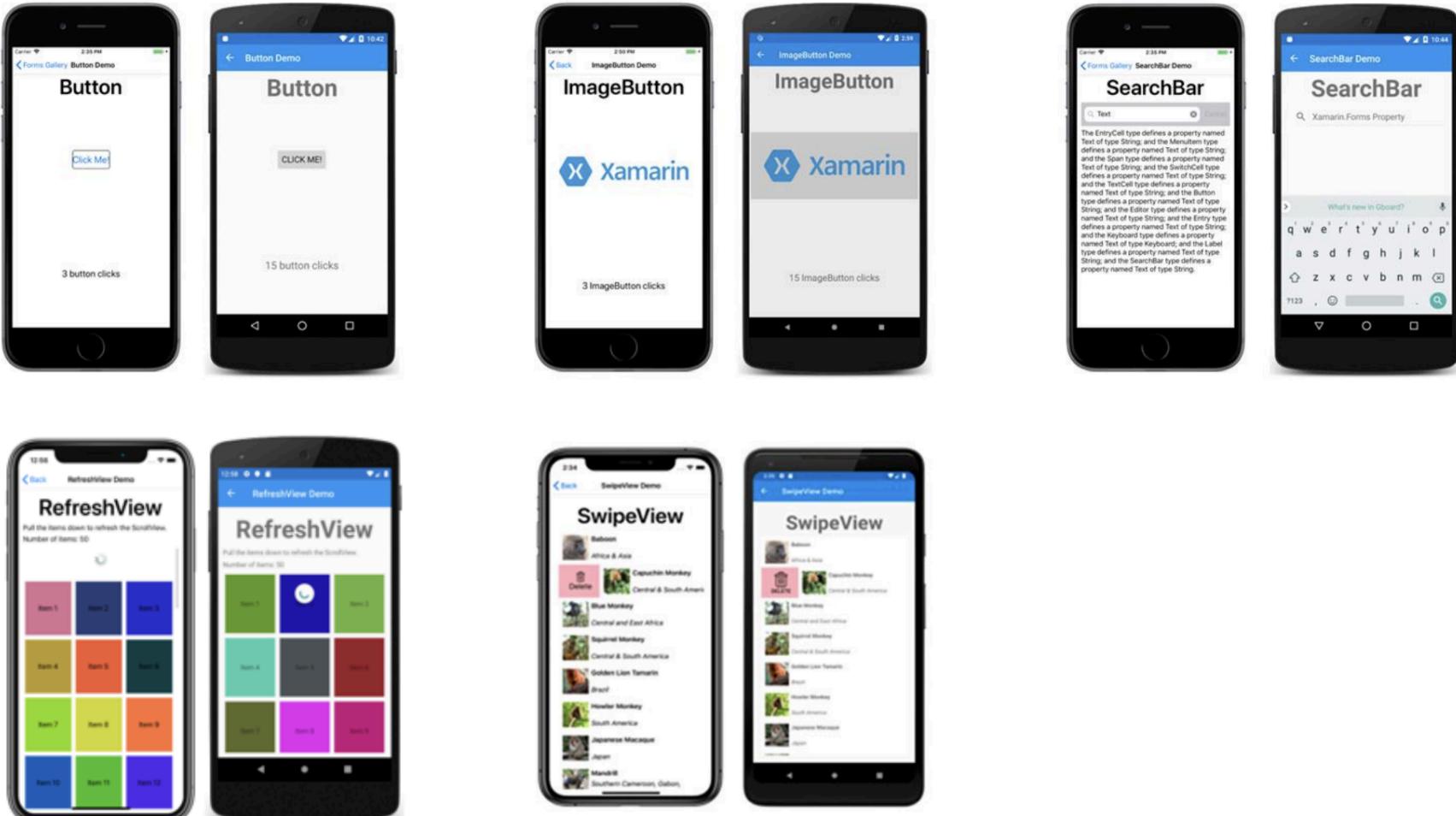
Controls

ActivityIndicator	BoxView	Button	DatePicker	Editor
Entry	Image	Label	TimePicker	Slider
OpenGLView	Picker	ProgressBar	SearchBar	Stepper
WebView	TableView	ListView	TextCell	EntryCell
ImageCell	SwitchCell	ViewCell	Map	...

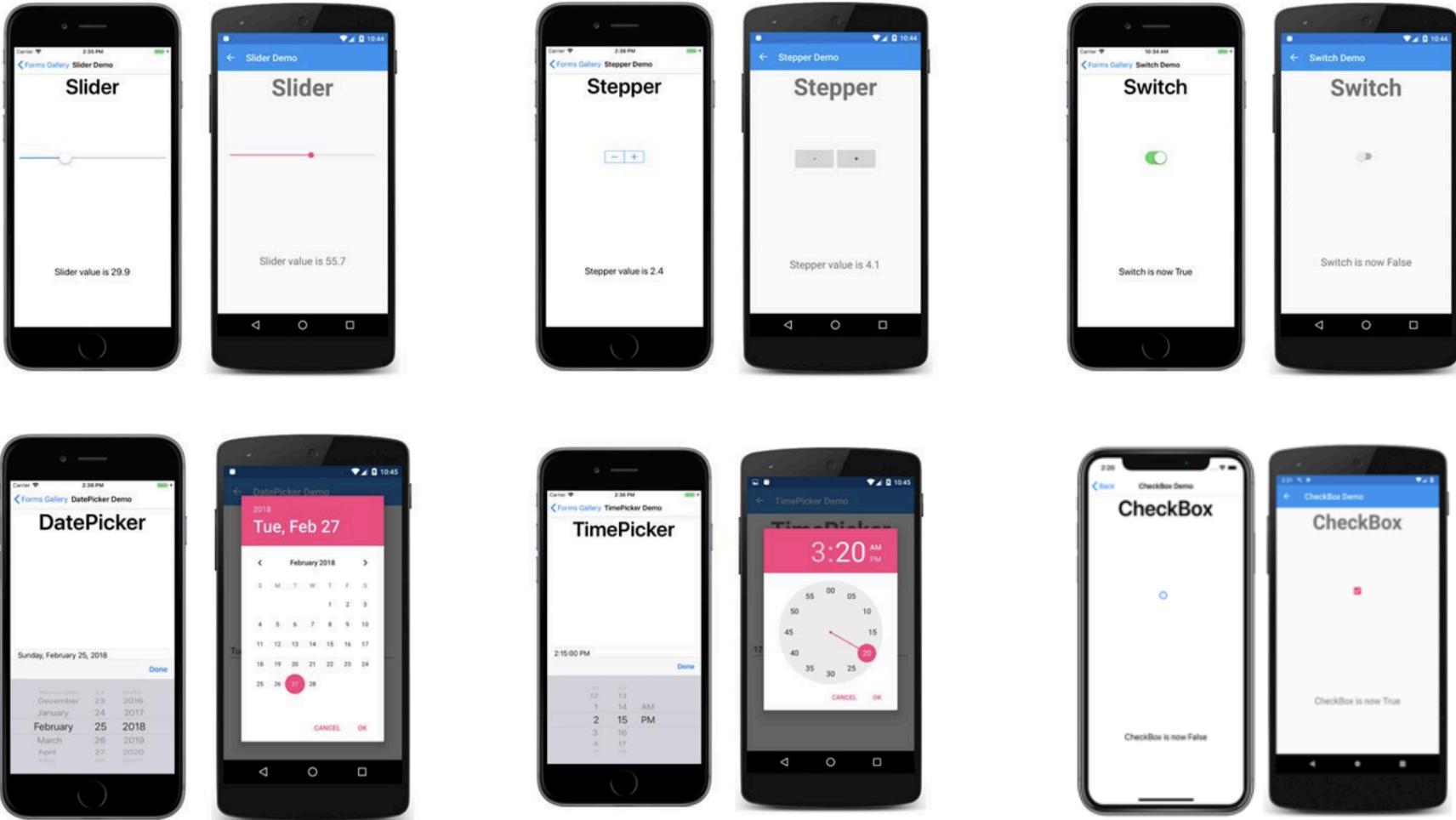
Content Presentation



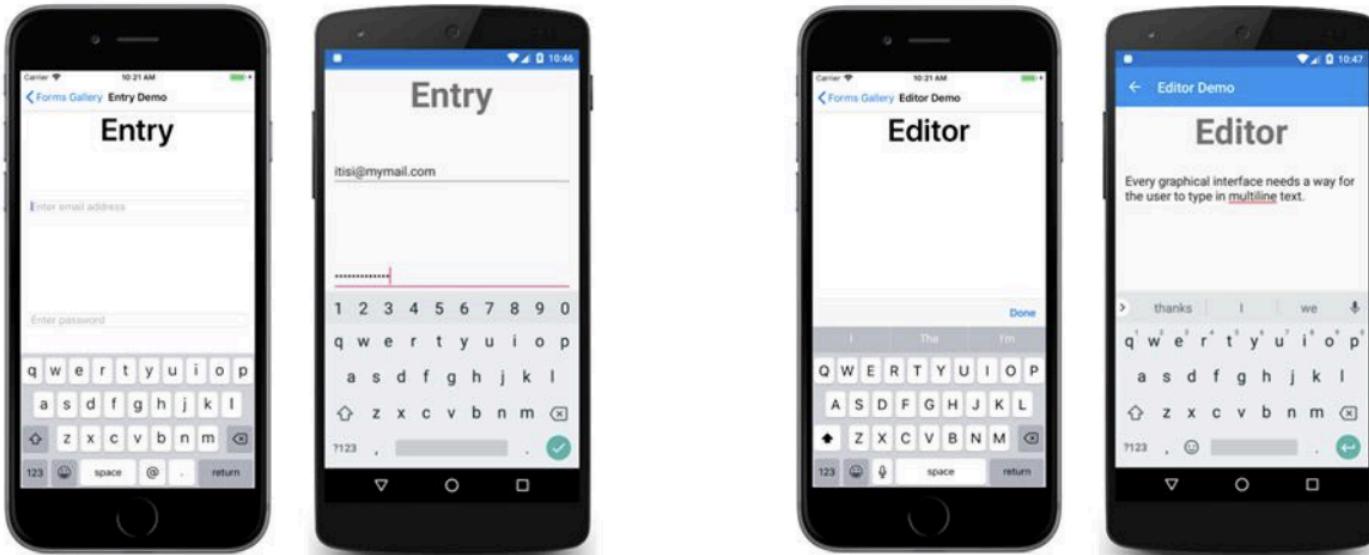
Actionable Controls



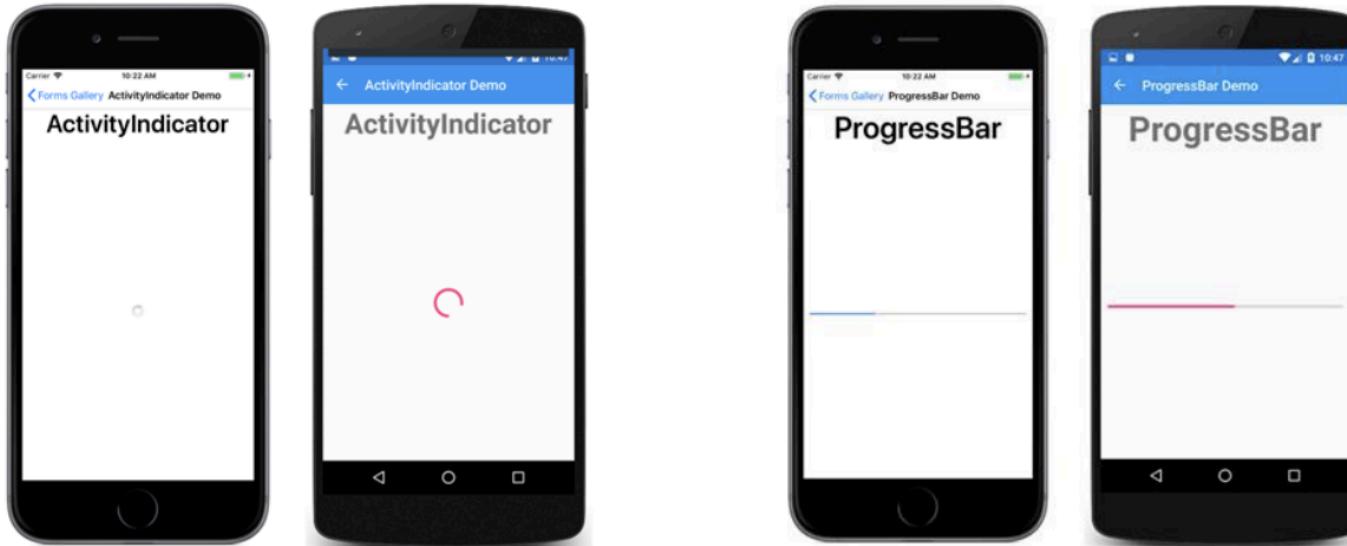
Setting Values



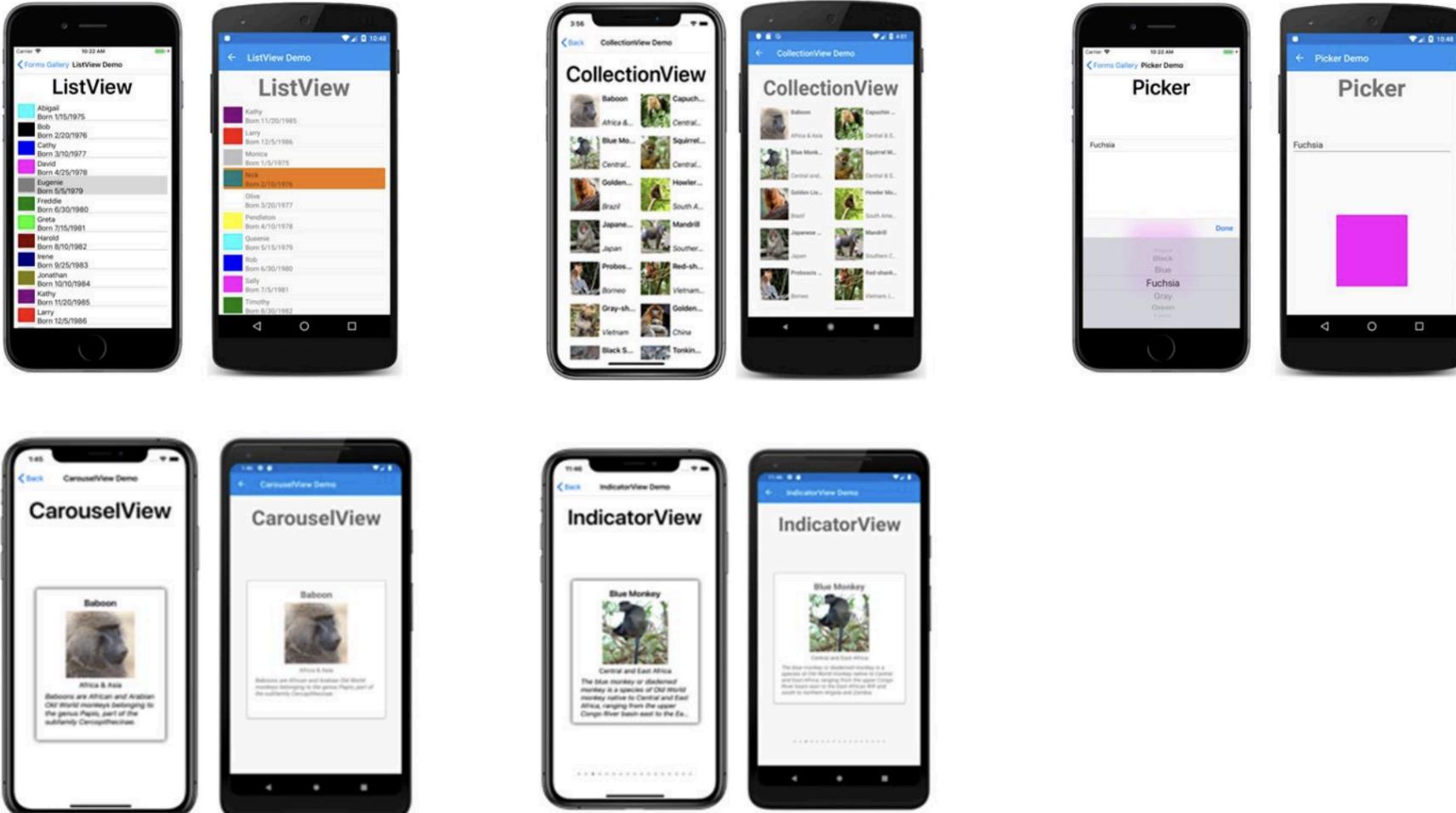
Editing Text



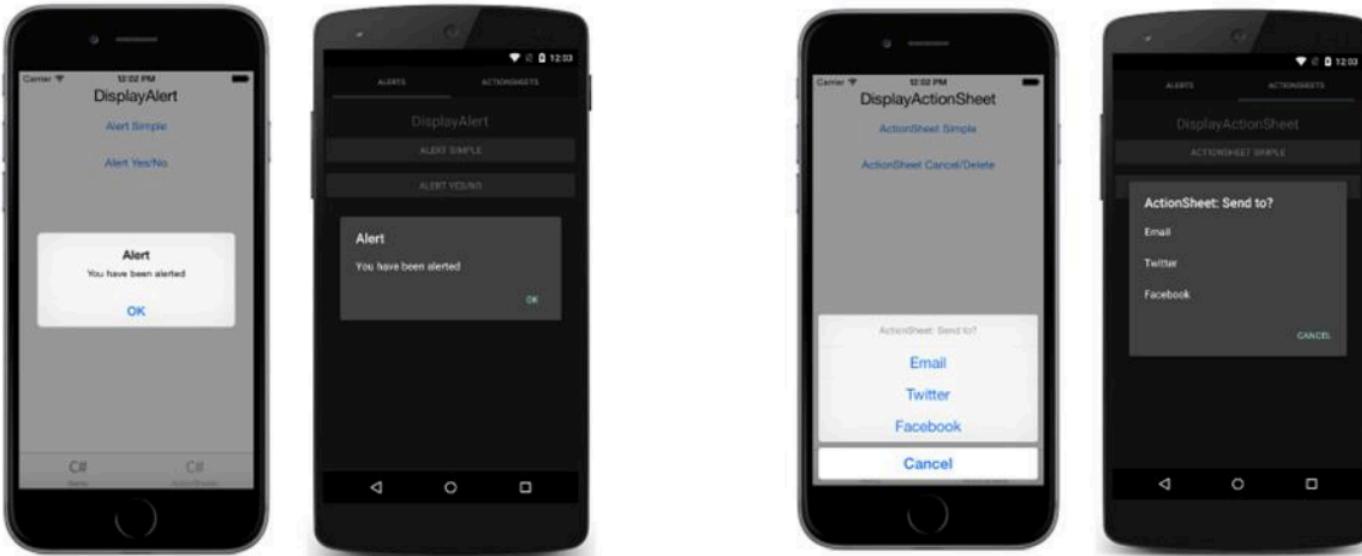
Activity Indication



Collections



Pop-ups



Commercial components



Bonus - Pages

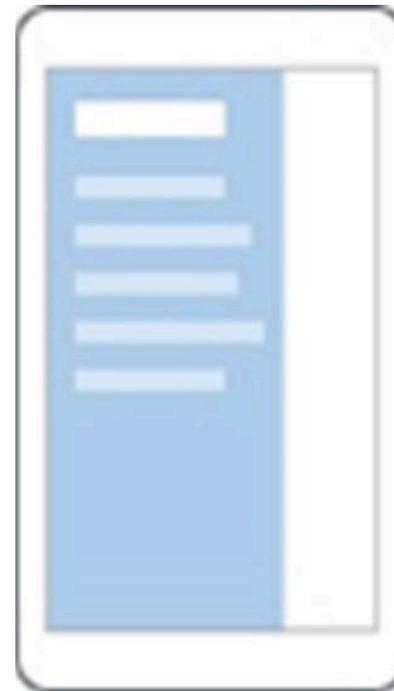
ContentPage

Single content



FlyoutPage

Items + detail



Bonus - Pages

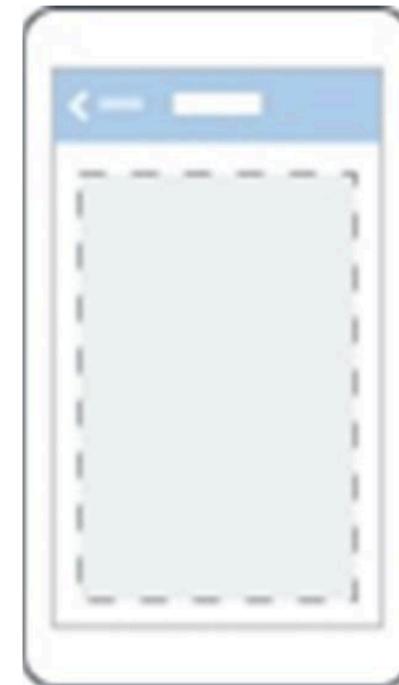
TabPage

Tabs



NavigationPage

Enables navigation



Bonus - Pages

- First displayed page is in App.xaml.cs
 - Default - MainPage

Today's Goals

- People introduction
- Get in touch with .NET MAUI
- Go through environment setup
- Get to know available layouts and controls