

# 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

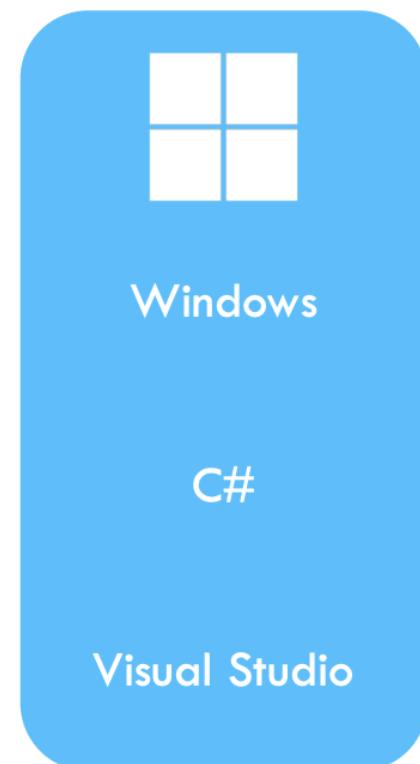
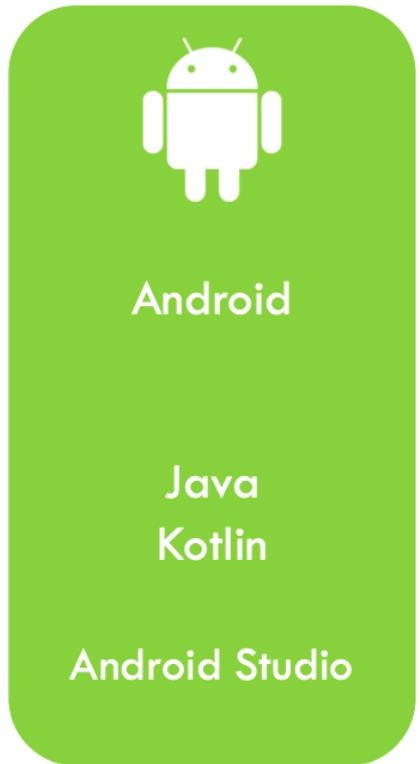
- Interactive syllabi – IS
  - Materials & Resources
    - [Materials repository](#)
    - [Sample app repository](#)
  - Stream/recordings – [Youtube](#)
  - Optional homeworks
  - Project
- [Discord](#)



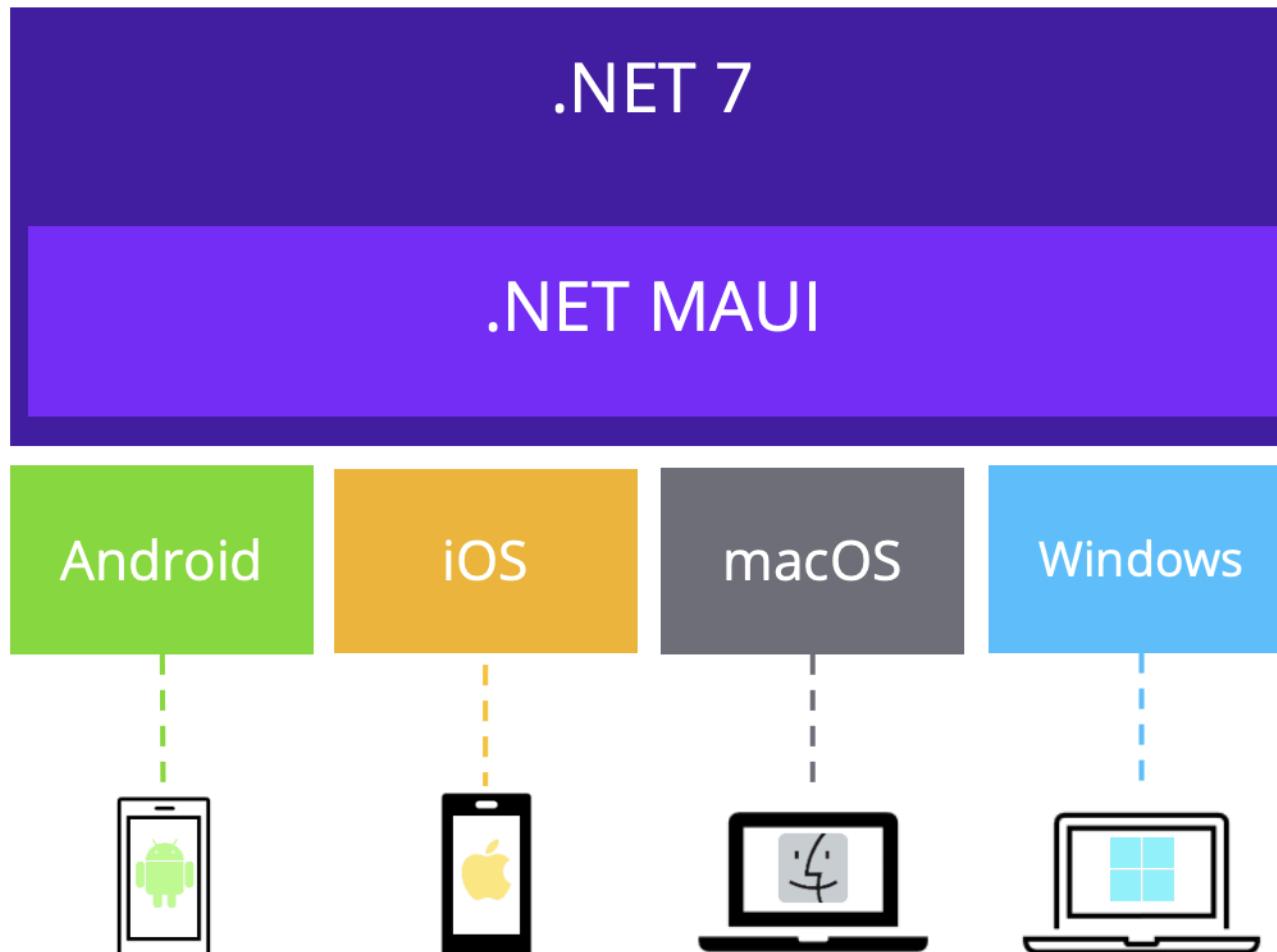
# Sample Application

- 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

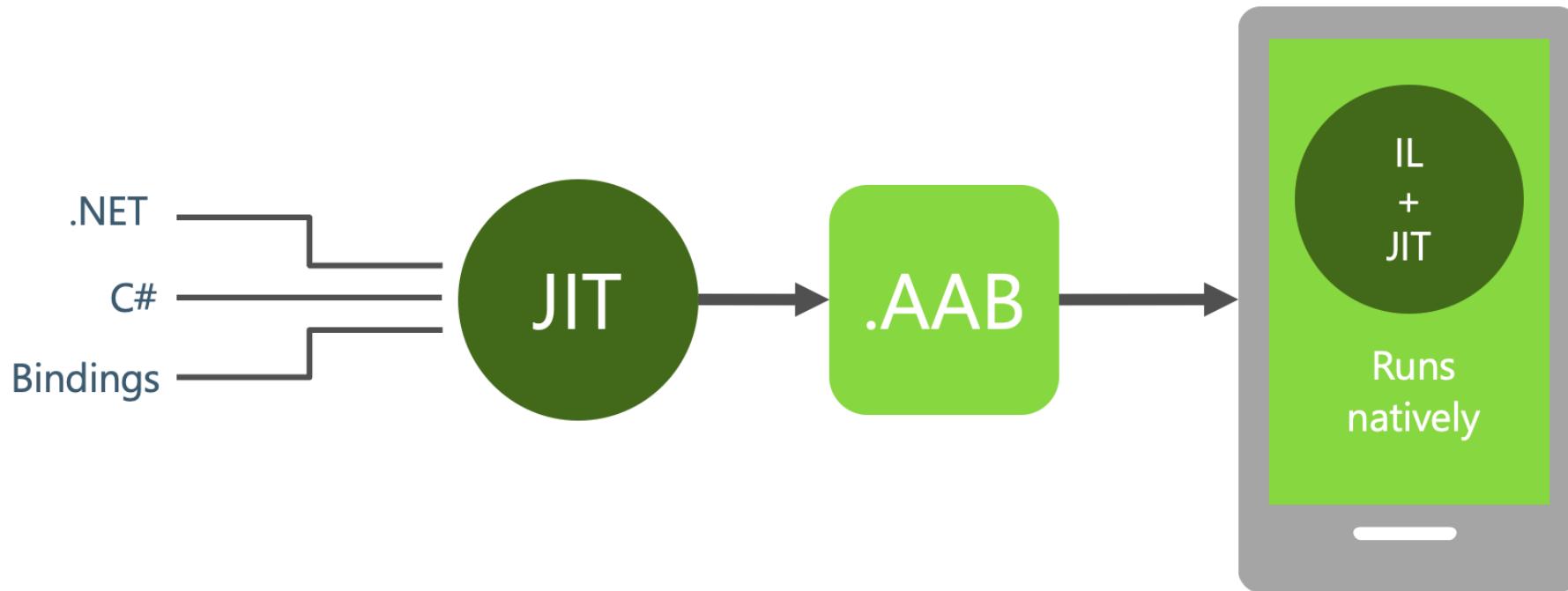
- Platform specific frameworks
  - .NET for Android
  - .NET for iOS
  - .NET for MacOS
- Windows UI (WinUI) library
- Common BCL - .NET
- .NET Runtimes
  - Mono – Android, iOS, MacOS
  - WinRT/Win32 – Windows

# 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

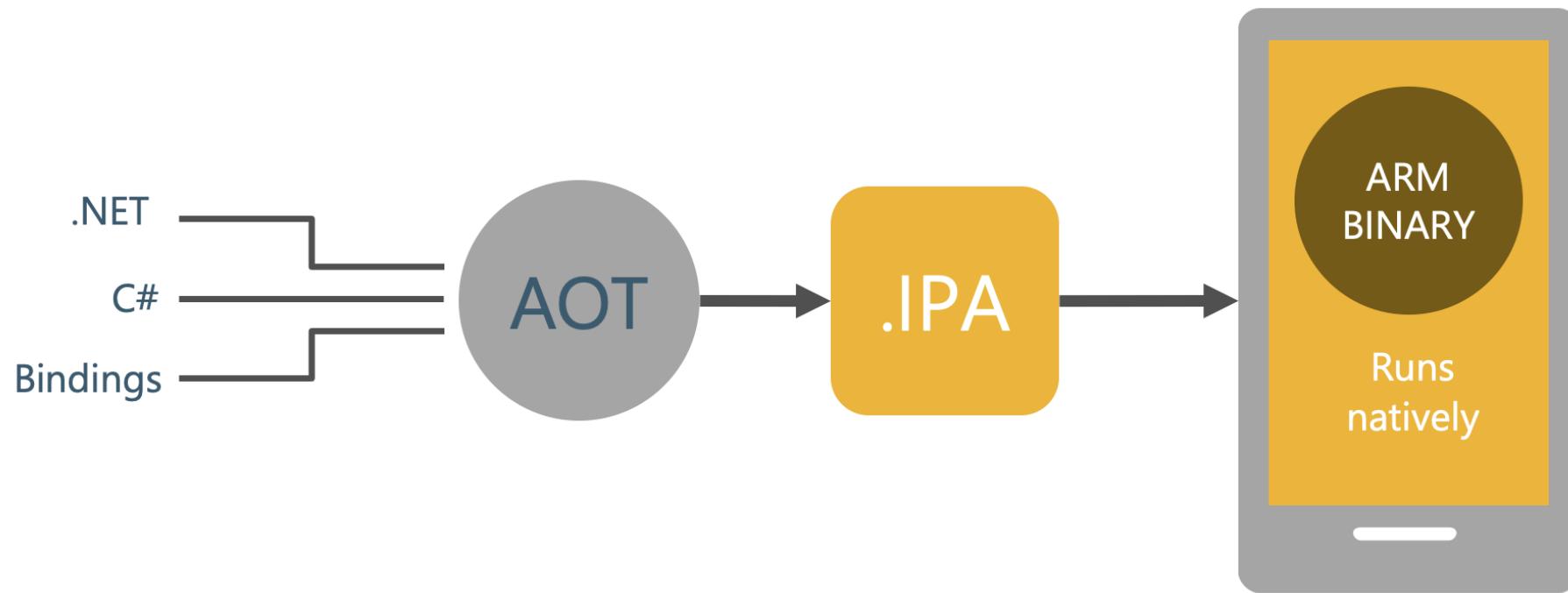
# How it Works - Android

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



# How it Works - iOS

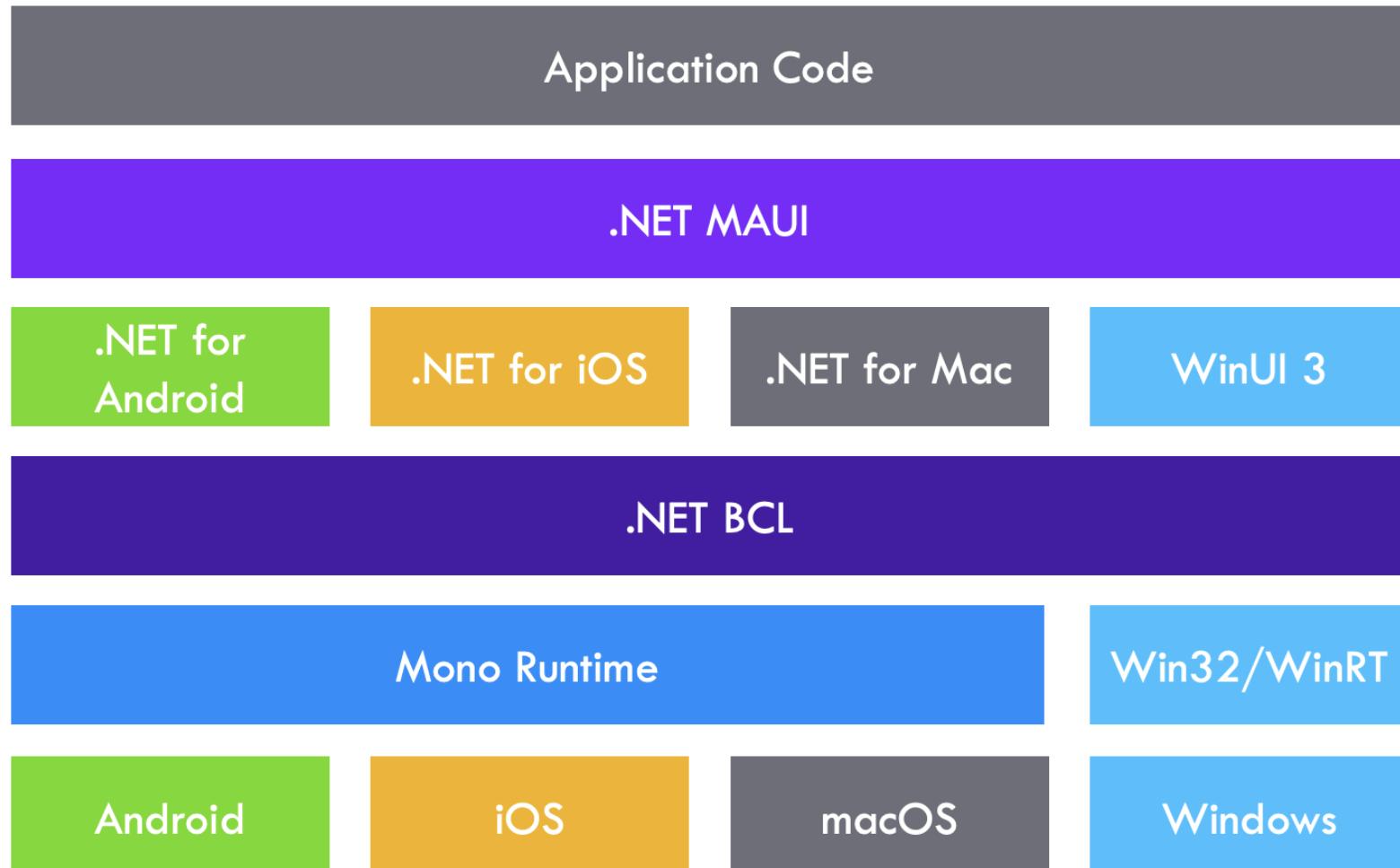
- Fully ahead-of-time (AOT) compiled to native ARM binary



# 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



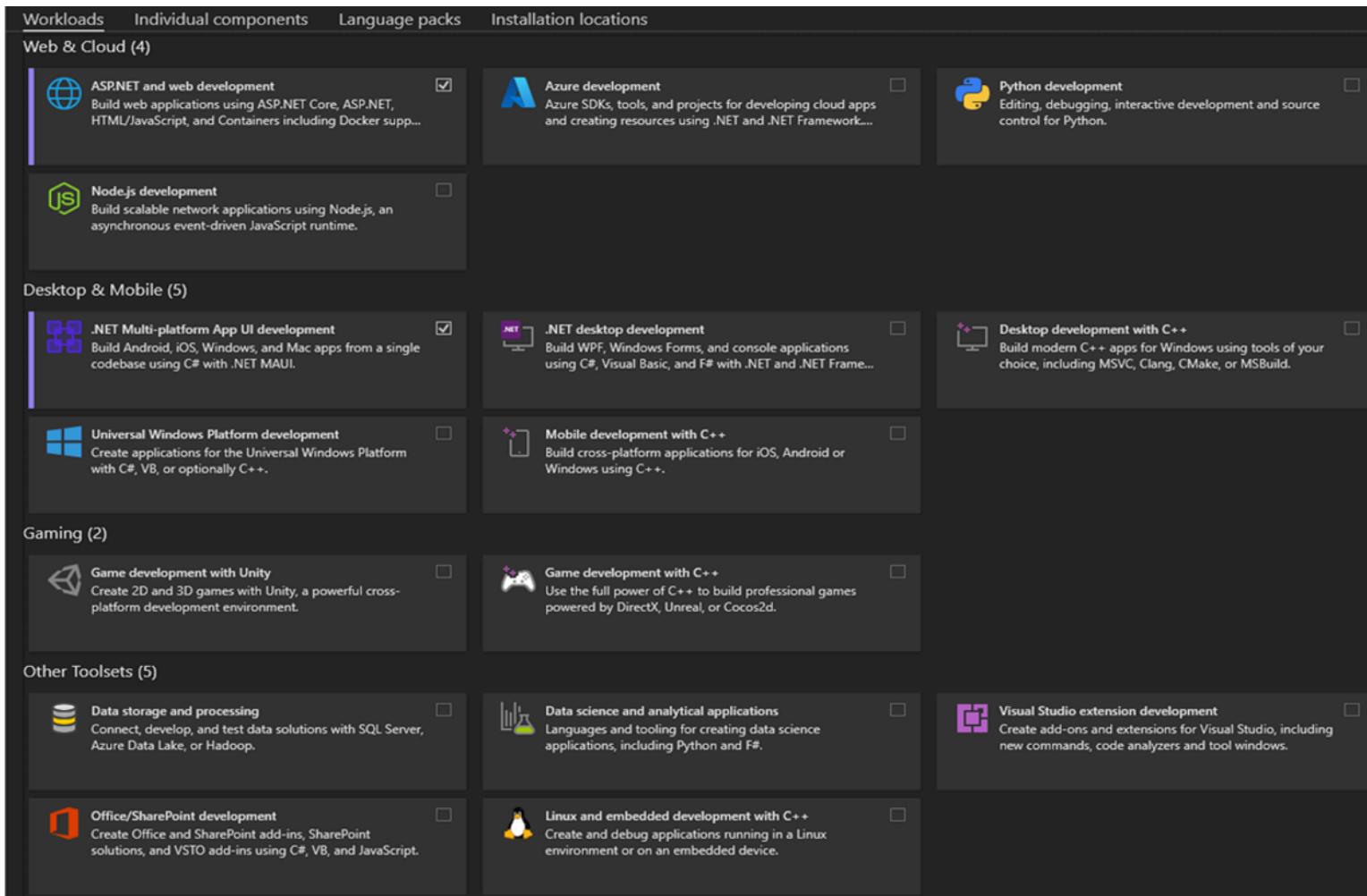
# .NET MAUI

- 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



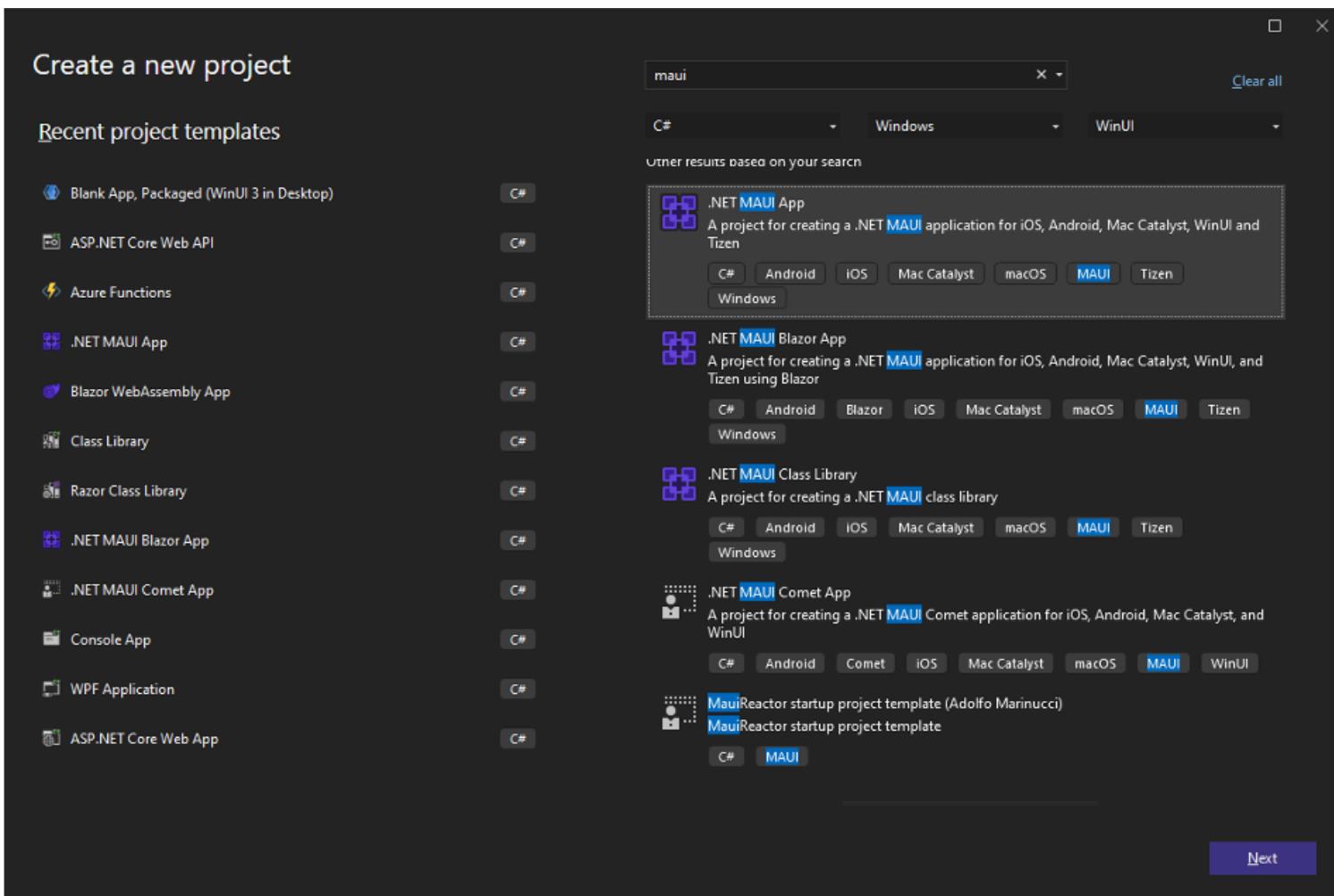
# Visual Studio Workloads



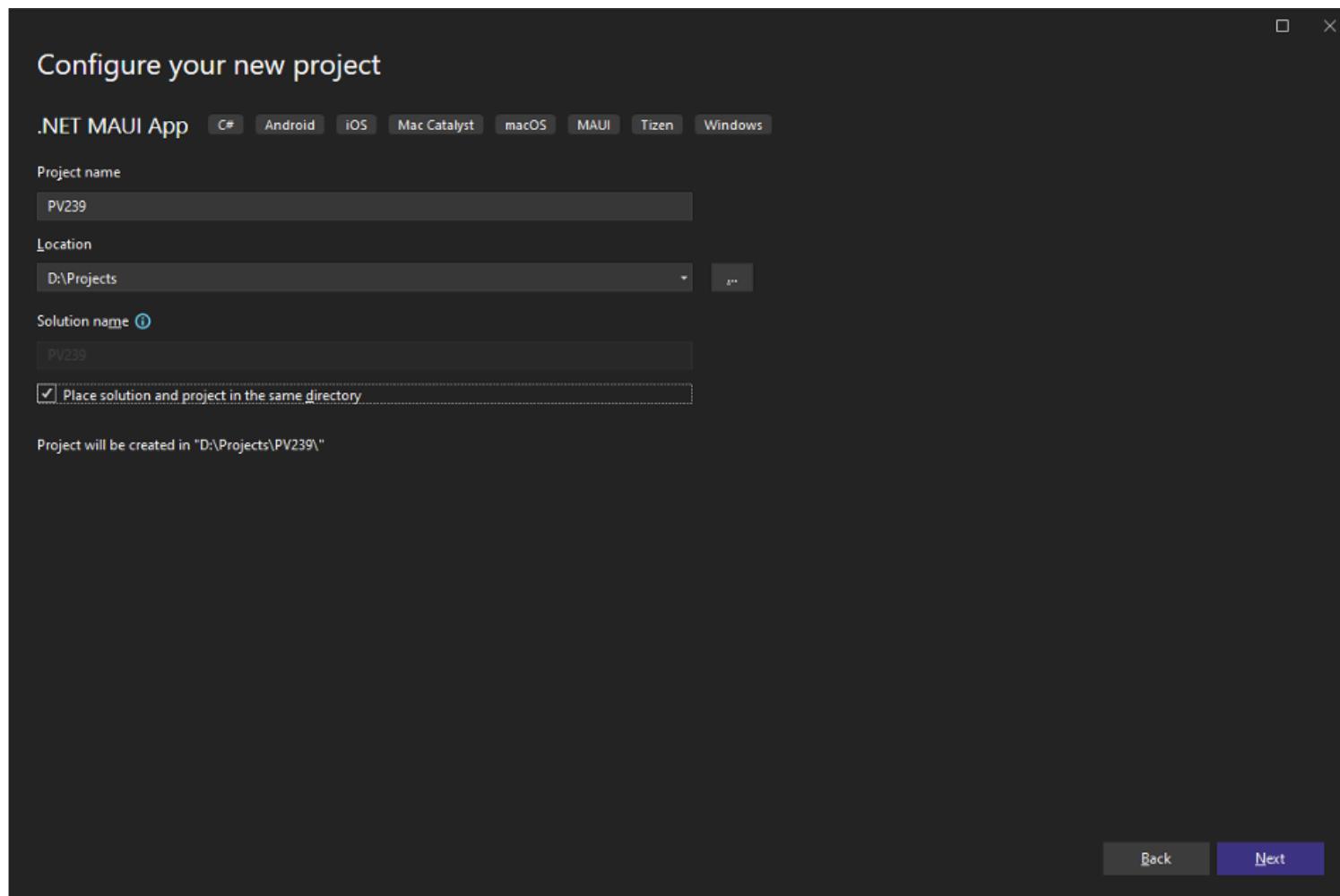
# iOS Development

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

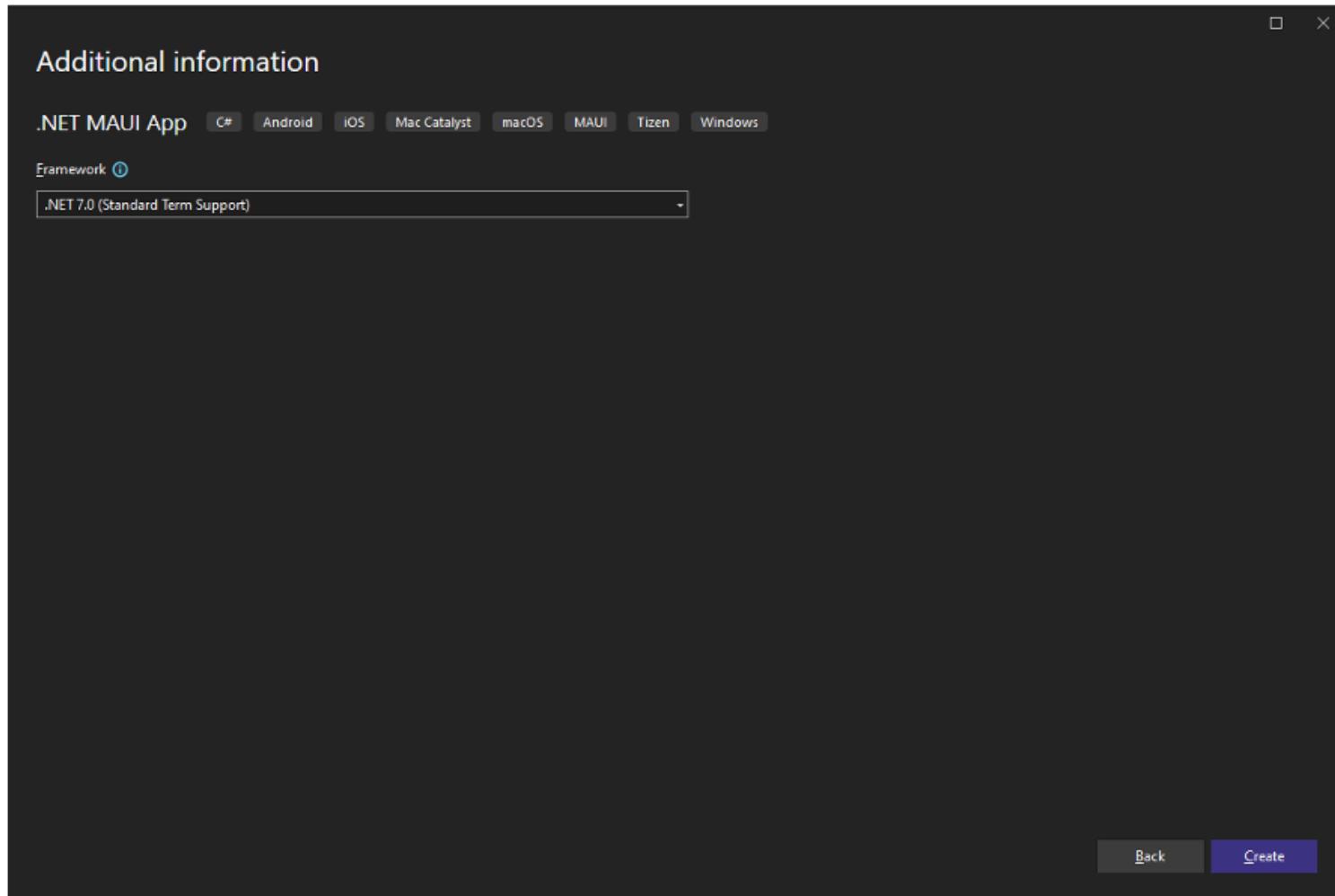
# Create a New Project



# Create a New Project



# Create a New Project



# Create a New Project

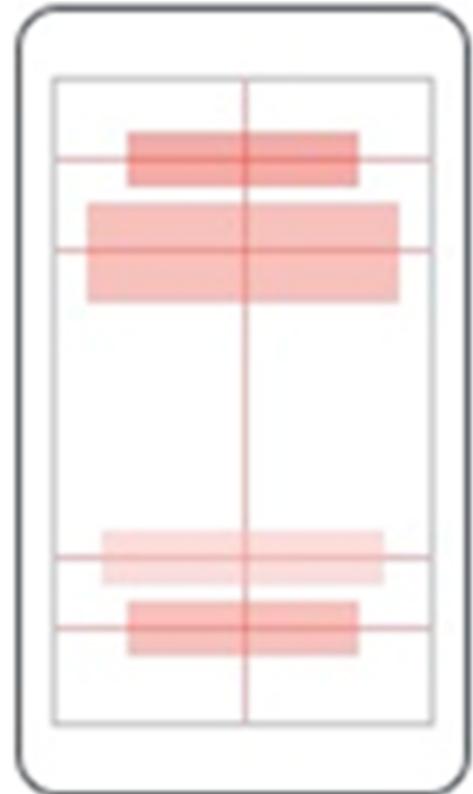
DEMO

# Project Structure

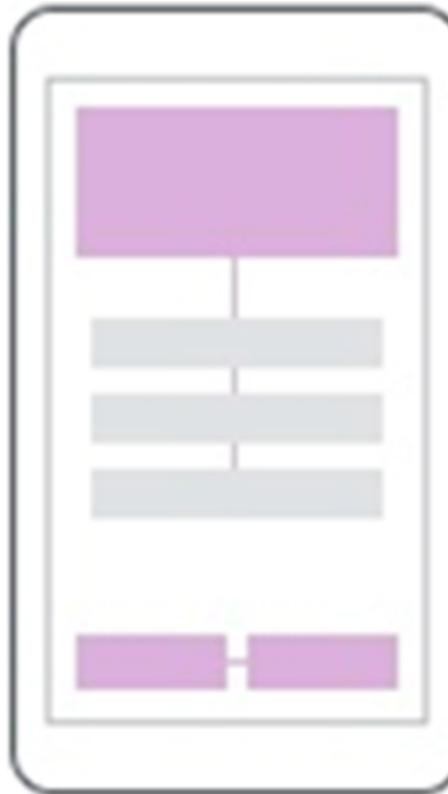
- One project for all platforms
- Shared code & resources (fonts, images, icons, splash screens...)
- Platforms folder:
  - Android – system colors, manifest
  - iOS – launch screen, Info.plist
  - Windows – package manifest, app manifest
  - Mac OS – Info.plist
  - Each platform
    - Application startup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

# Layouts

AbsoluteLayout



RelativeLayout

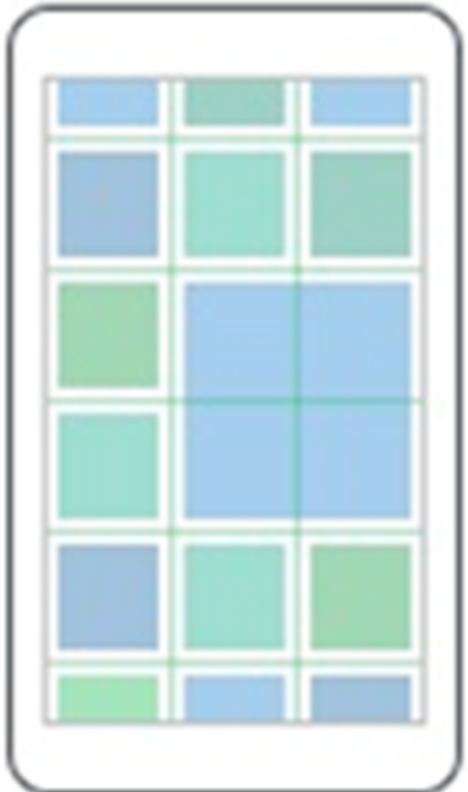


FlexLayout

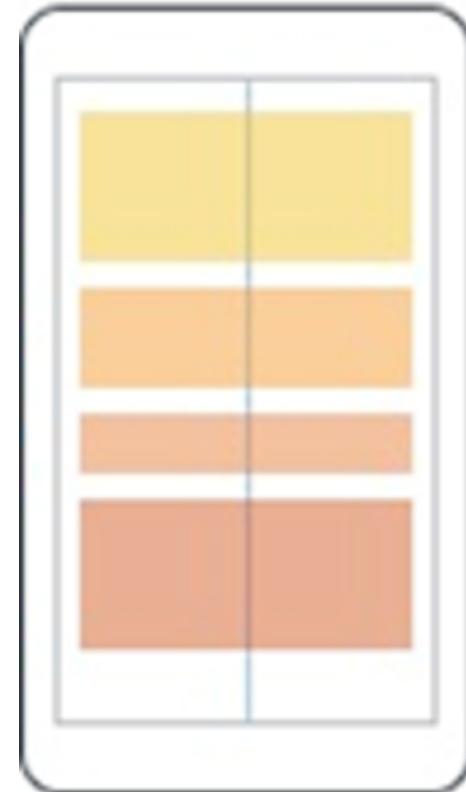


# Layouts

**Grid**

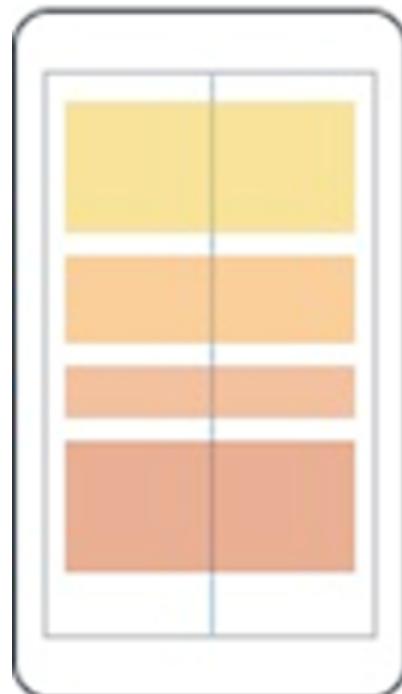


**StackLayout**

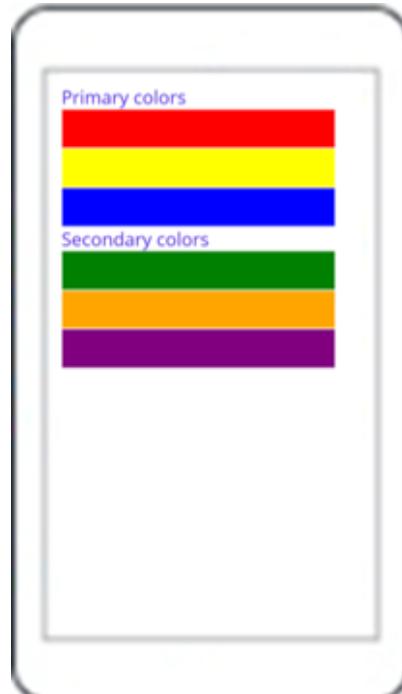


# Layouts - StackLayout

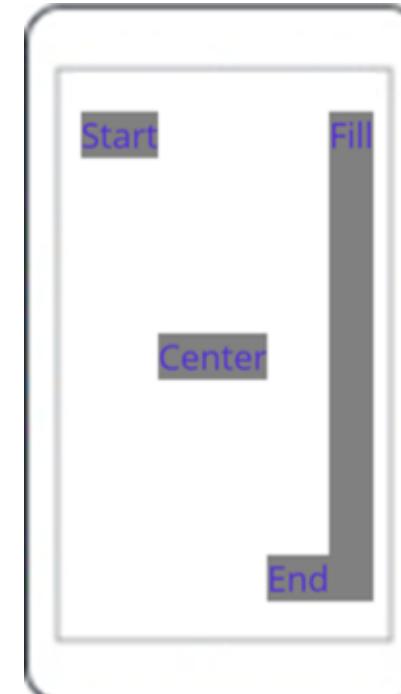
StackLayout



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

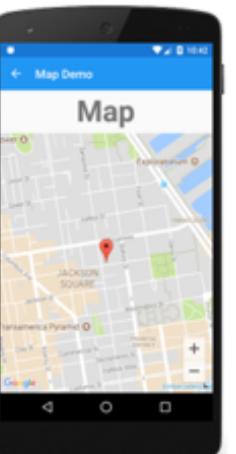
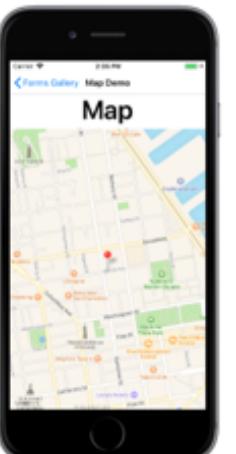
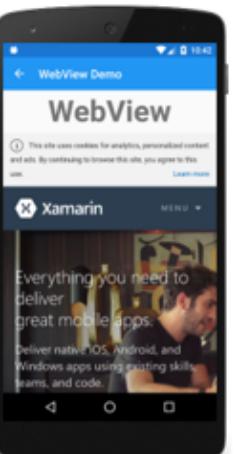
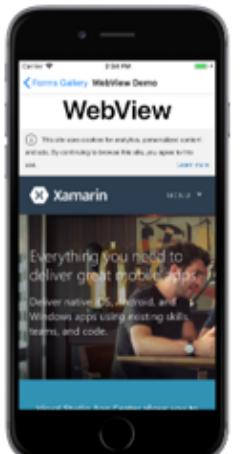
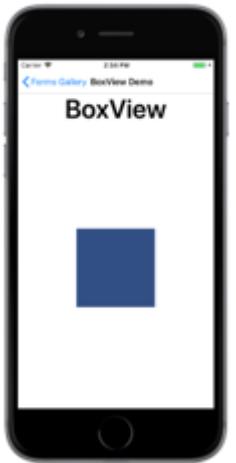
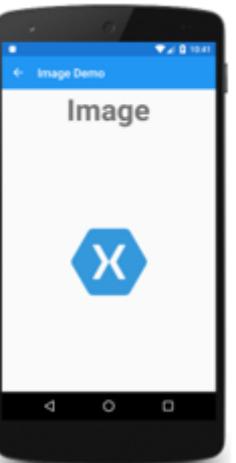
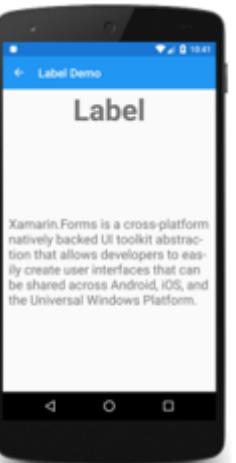
# Layouts

DEMO

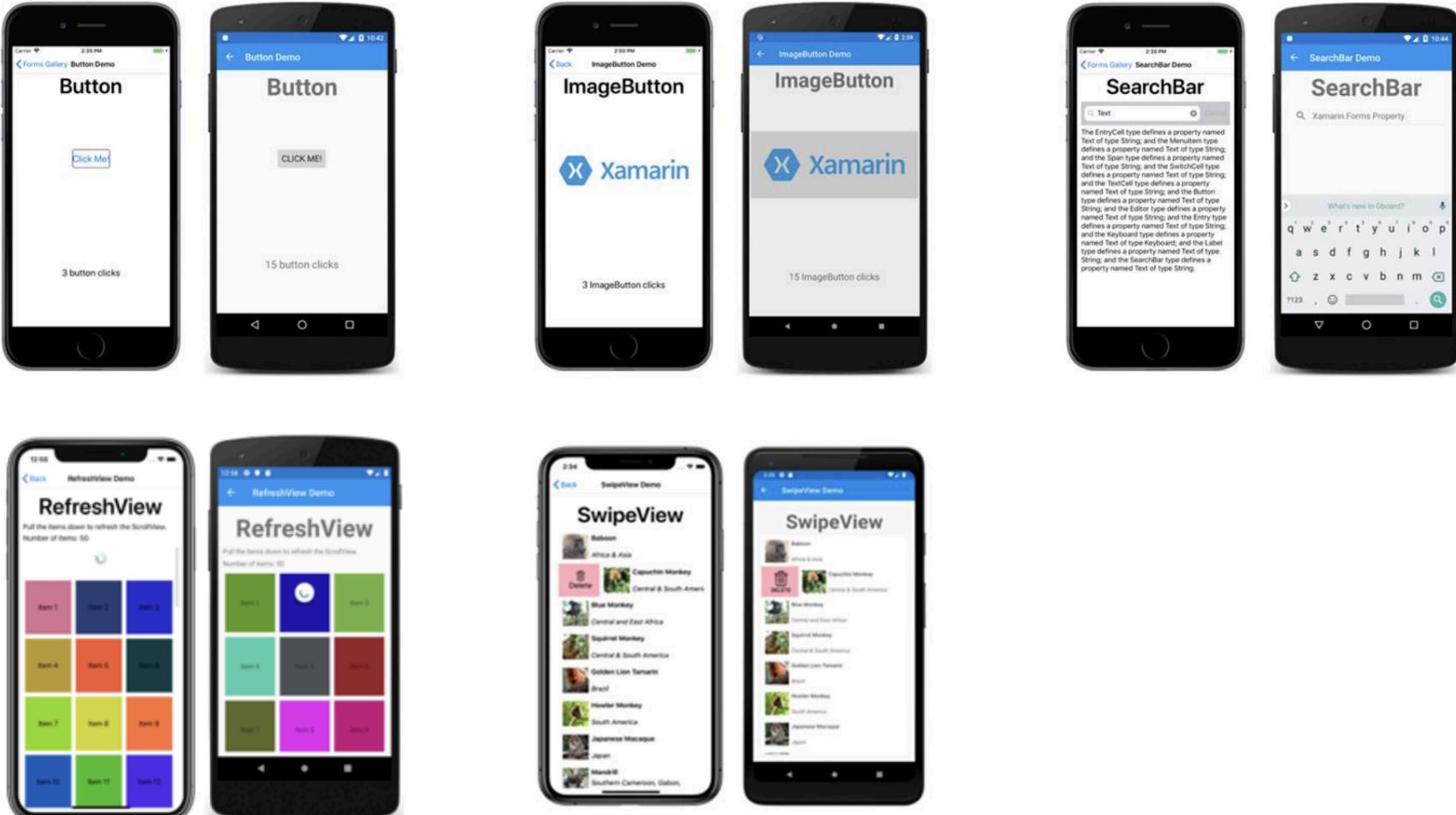
# Controls

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

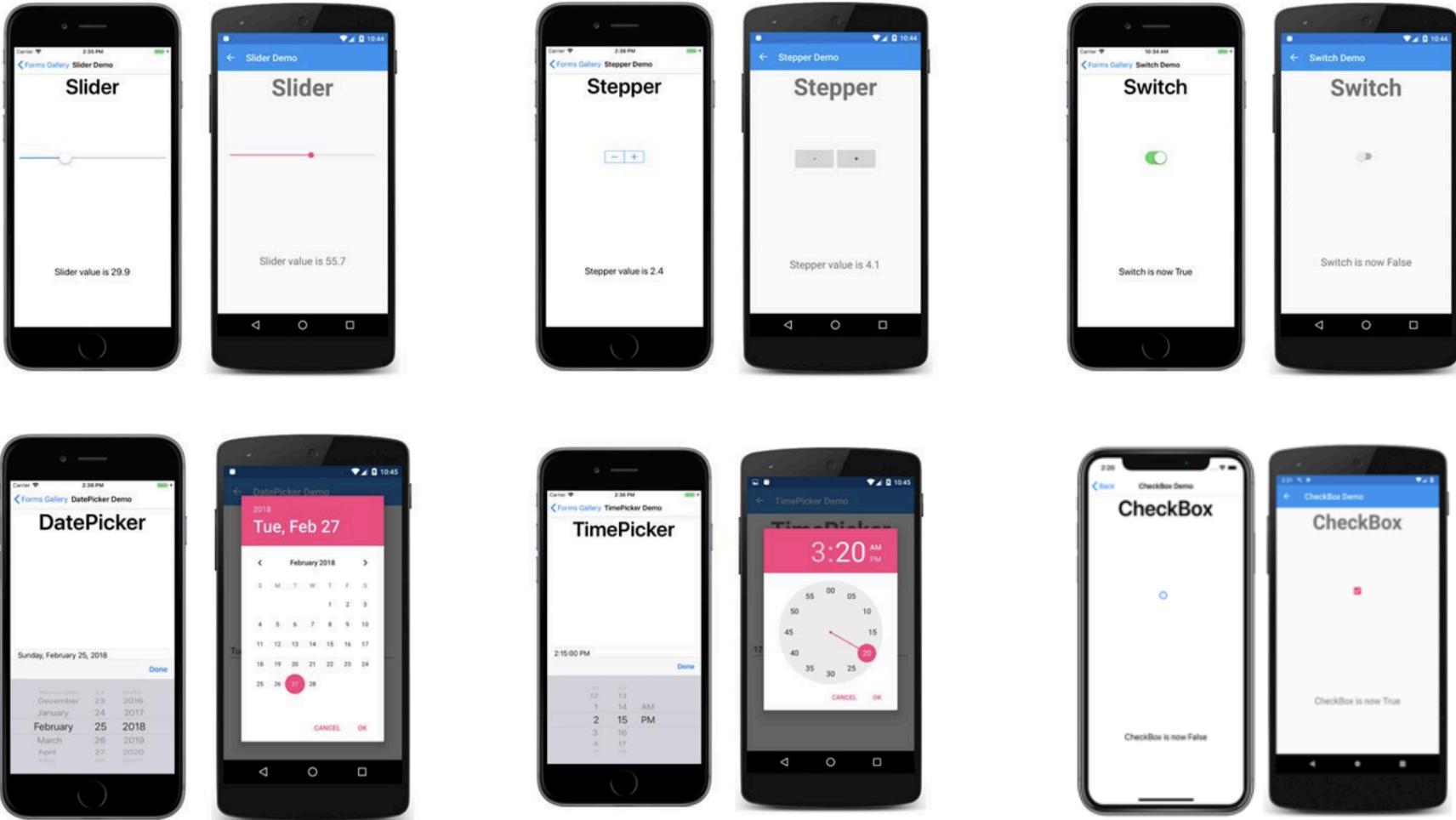
# Content Presentation



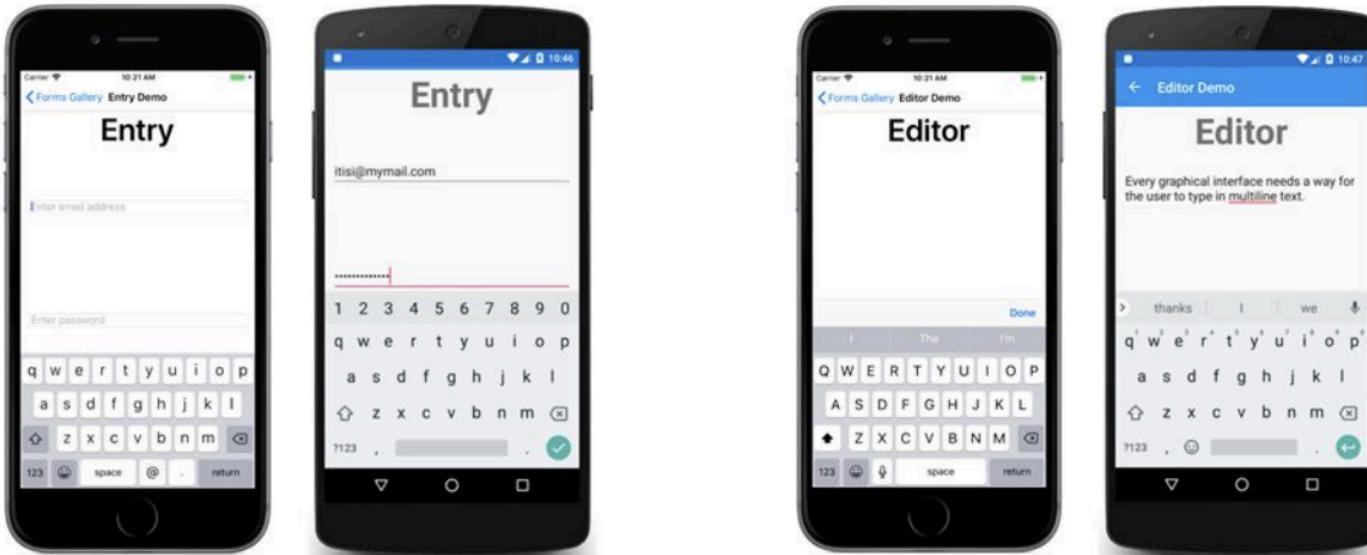
# Actionable Controls



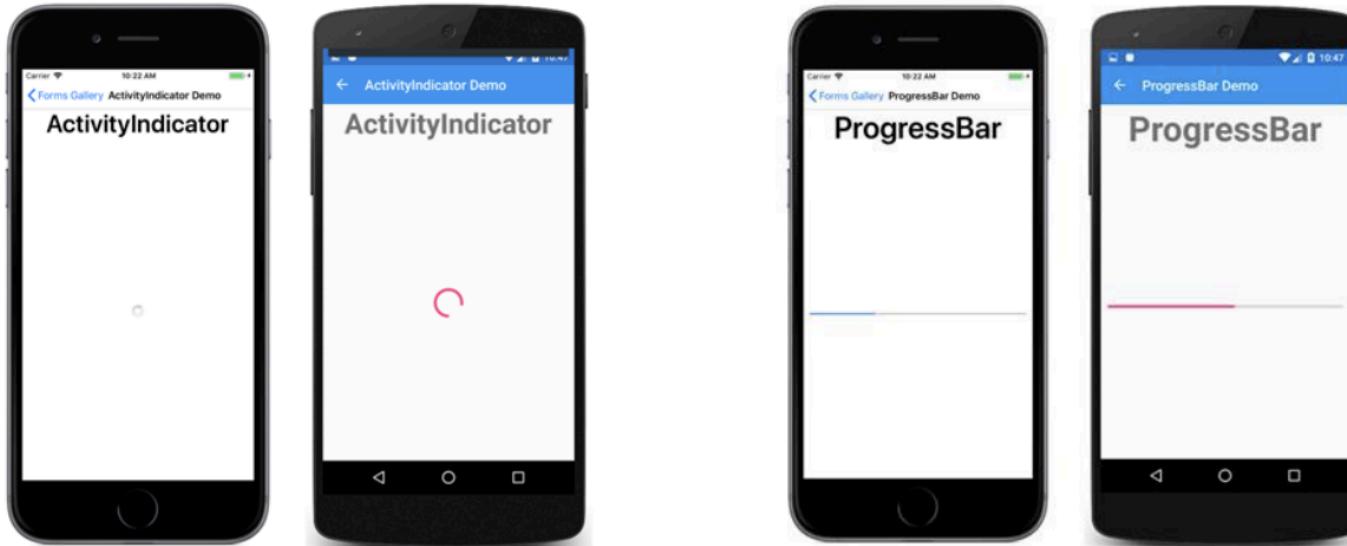
# Setting Values



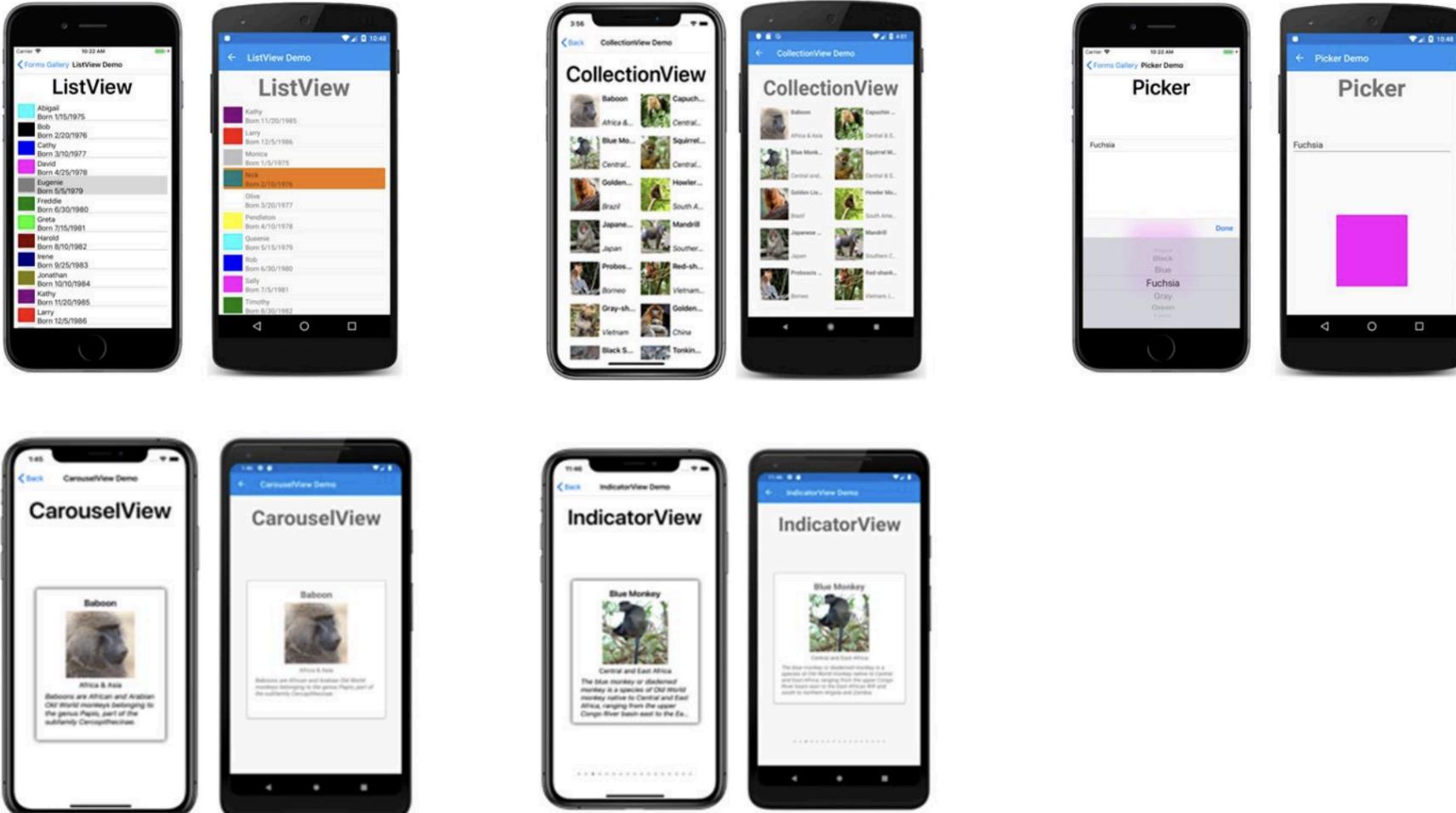
# Editing Text



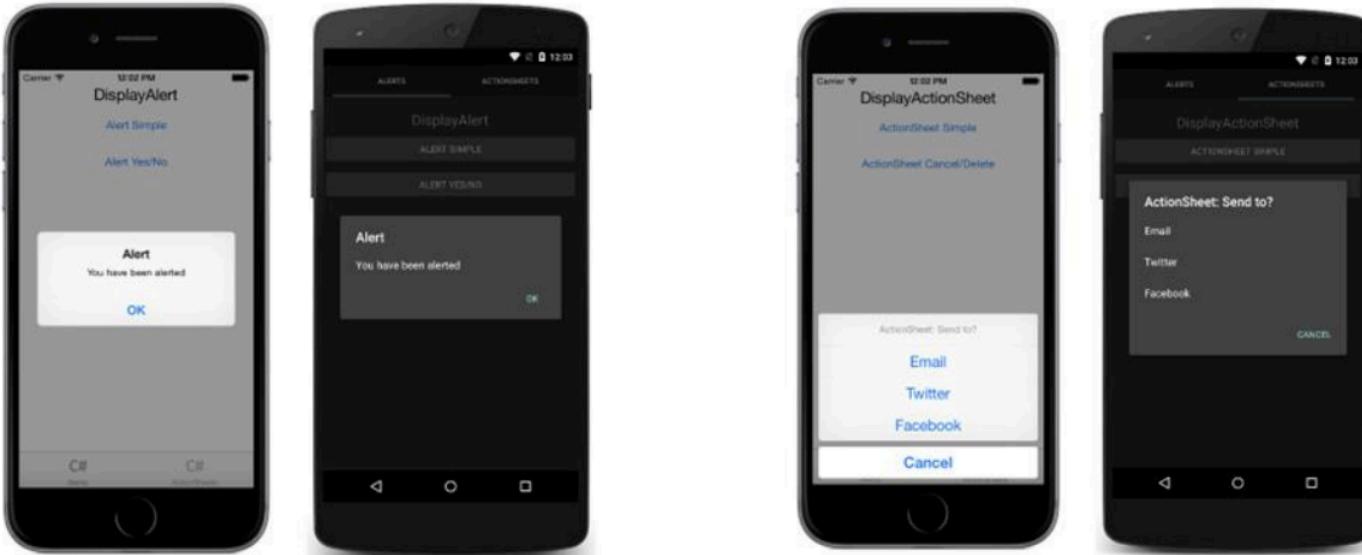
# Activity Indication



# Collections



# Pop-ups



# Commercial components



# Bonus - Pages

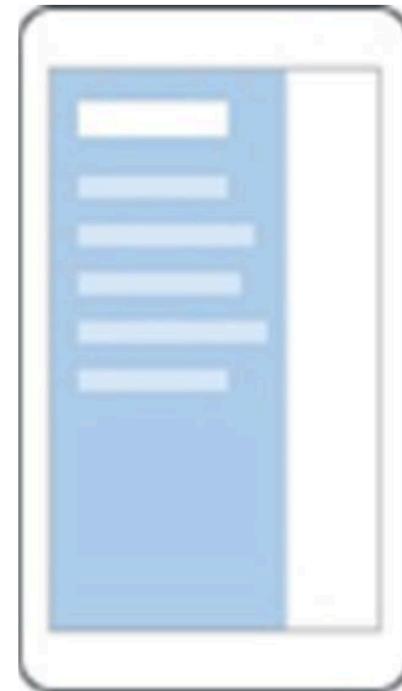
## **ContentPage**

Single content



## **FlyoutPage**

Items + detail



# Bonus - Pages

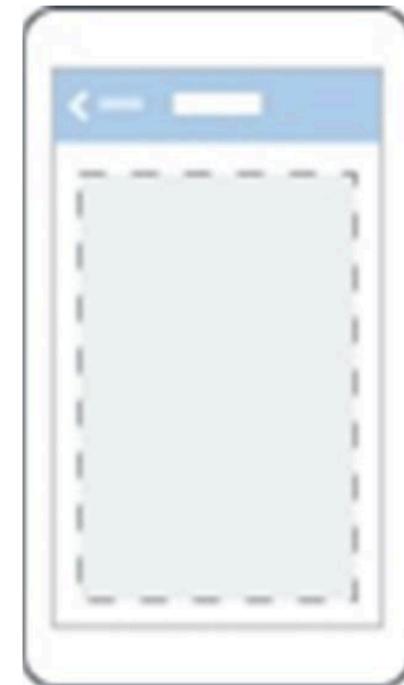
## TabPage

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