Curs

.NET MAUI – Elemente avansate

Binding cu BindingContext

```
<StackLayout Padding="10, 0">
        <Label Text="TEXT"
           FontSize="80"
           HorizontalOptions="Center"
           VerticalOptions="CenterAndExpand"
           BindingContext="{x:Reference Name=slider}"
           Rotation="{Binding Path=Value}" />

        <Slider x:Name="slider"
            Maximum="360"
            VerticalOptions="CenterAndExpand" />
```

UNIVERSITATEA BABEȘ-BOLYAI

Binding fara BindingContext

```
<StackLayout Padding="10, 0">
    <Label Text="TEXT"
           FontSize="40"
           HorizontalOptions="Center"
           VerticalOptions="CenterAndExpand"
           Rotation="{Binding Source={x:Reference slider},
                              Path=Value}" />

    <Slider x:Name="slider"
            Maximum="360"
            VerticalOptions="CenterAndExpand" />
</StackLayout>
```

UNIVERSITATEA BABEŞ-BOLYAI

Mostenire BindingContext

```
<StackLayout Padding="10">
    <StackLayout VerticalOptions=“CenterAndExpand"
                 BindingContext="{x:Reference slider}">
        <Label Text="TEXT"
               FontSize="80"
               HorizontalOptions="Center"
               VerticalOptions=“CenterAndExpand"
               Rotation="{Binding Value}" />
</StackLayout>
    <Slider x:Name="slider"
            Maximum="360" />
</StackLayout>
```

UNIVERSITATEA BABEŞ-BOLYAI

String format

- Setarea proprietatii StringFormat pentru markup extension-ului Binding catre un string de formatare care contine un placeholder:

```
<TextCell Text="{Binding Description}"
      Detail="{Binding Date, StringFormat='Date is {0:dddd, MMMM dd}'}" />
```

```
<Slider x:Name="slider" /> <Label Text="{Binding Source={x:Reference slider},
Path=Value, StringFormat='The slider value is {0:F2}'}" />
```

- În XAML, șirul de formatare este delimitat de caractere cu ghilimele simple
- Utilizarea proprietății StringFormat are sens numai atunci când proprietatea țintă este de tip string, iar modul de binding este OneWay sau TwoWay.

UNIVERSITATEA BABEȘ-BOLYAI

Behaviors

- Permit adaugarea de functionalitati la controalele de interfata
- Functionalitatea este implementata intr-o clasa de tip Behaviour si atasata controlului respectiv ca si cum ar fi o parte a controlului
- Exemple de utilizare:
  - Crearea unui validari pentru un control de tip Entry
  - Controlul unui animatii
  - Adaugarea de efecte la un control

UNIVERSITATEA BABEŞ-BOLYAI

.NET MAUI behaviors

- Cream o clasa care mosteneste clasa Behavior
- Suprascriem metoda OnAttachedTo
- Suprascriem metoda OnDetachingFrom
- Implementam functionalitatea behavior-ului

UNIVERSITATEA BABEȘ-BOLYAI

```
class ValidationBehaviour : Behavior<Editor>
    {

        protected override void OnAttachedTo(Editor entry)
        {
            entry.TextChanged += OnEntryTextChanged;
            base.OnAttachedTo(entry);

        }

        protected override void OnDetachingFrom(Editor entry)

        {

            entry.TextChanged -= OnEntryTextChanged;
            base.OnDetachingFrom(entry);

        }

        void OnEntryTextChanged(object sender, TextChangedEventArgs args)
        {

            ((Editor)sender).BackgroundColor = string.IsNullOrEmpty(args.NewTextValue) ?
Color.FromRgba("#AA4A44") : Color.FromRgba("#FFFFFF");
        }
    }
```

- Metoda OnAttachedTo este apelata imediat ce behavior este atasat unui control
- Metoda OnDetachingFrom este apelata imediat ce behavior-ul este inlaturat (entry.Behaviors.Clear();)
- Primesc ca parameter o referinta catre controlul care este atasat

UNIVERSITATEA BABEŞ-BOLYAI

Consumarea unui behavior

```
<Editor Placeholder="Enter the description of the shopping list"
                Text="{Binding Description}"
                HeightRequest="50" >

                <Editor.Behaviors>
                    <local:ValidationBehaviour />
                </Editor.Behaviors>
            </Editor>
```

UNIVERSITATEA BABEȘ-BOLYAI

Clasa Geocoding

- Ofera posibilitatea de a gasi coordonatele pentru o adresa si invers: gasirea adresei pentru un set de coordonate
- Proprietati: Latitudinea, Longitudinea si Altitudinea
- Altitudinea nu este intotdeauna disponibila – proprietatea Altitude poate fi null sau 0. Daca este disponibila, valoarea indica metri deasupra nivelului marii

UNIVERSITATEA BABEȘ-BOLYAI

Clasa Geocoding - exemplu

```
var address = "FSEGA Theodor Mihali Cluj-Napoca";

var locations = await Geocoding.GetLocationsAsync(address);


        var options = new MapLaunchOptions { Name = “Facultatea mea" };


        var location = locations?.FirstOrDefault();

Console.WriteLine($"Latitude: {location.Latitude}, Longitude:
{location.Longitude}, Altitude: {location.Altitude}");
```

UNIVERSITATEA BABEŞ-BOLYAI

Reverse Geocoding

- Furnizeaza detalii legate de un obiectiv, pentru un set de coordinate furnizat:
- AdminArea - Judet
- CountryCode – Codul tarii (Ex. RO)
- CountryName – Nume tara
- FeatureName – Numele obiectivului de la acele coordonate/ Numarul
- Locality - Localitate
- PostalCode – Cod Postal
- SubAdminArea – Nume municipiu
- SubLocality – Nume Comuna
- SubThoroughfare – Numarul/ Interval Numeric
- Thoroughfare – Strada/Artera

UNIVERSITATEA BABEŞ-BOLYAI

Reverse Geocoding (II)

```
private async Task<string> GetGeocodeReverseData(double latitude = 47.673988,
double longitude = -122.121513)
 { IEnumerable<Placemark> placemarks = await
Geocoding.Default.GetPlacemarksAsync(latitude, longitude);
 Placemark placemark = placemarks?.FirstOrDefault();
if (placemark != null) {
return $"AdminArea: {placemark.AdminArea}\n" + $"CountryCode:
{placemark.CountryCode}\n" + $"CountryName: {placemark.CountryName}\n" +
$"FeatureName: {placemark.FeatureName}\n" + $"Locality: {placemark.Locality}\n"
+ $"PostalCode: {placemark.PostalCode}\n" + $"SubAdminArea:
{placemark.SubAdminArea}\n" + $"SubLocality: {placemark.SubLocality}\n" +
$"SubThoroughfare: {placemark.SubThoroughfare}\n" + $"Thoroughfare:
{placemark.Thoroughfare}\n";
}
return ""; }
```

UNIVERSITATEA BABEȘ-BOLYAI

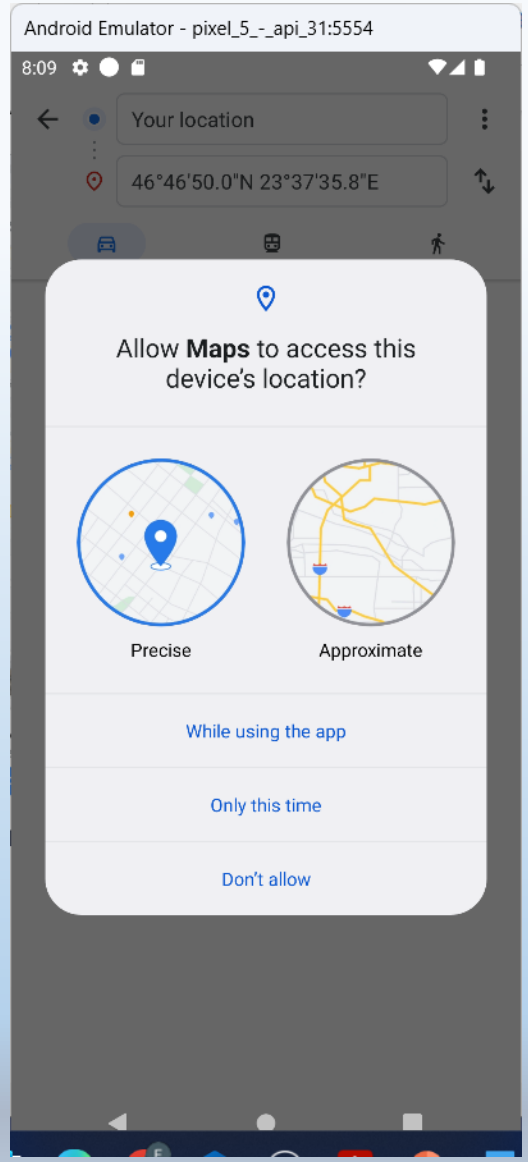
Clasa Geolocation

- Putem afla coordonatele curente de geolocalizare a dispozitivului
- Pentru a folosi functia de geolocalizare sunt necesare anumite actiuni de setup specific platformei
- Ex. Android adaugam in AndroidManifest.xml:

```
<uses-permission
android:name="android.permission.ACCESS_FINE_LOCATIO
N" />

<uses-permission
android:name="android.permission.ACCESS_COARSE_LOCAT
ION" />
```

API-ul pentru geolocalizare va cere permisiunea utilizatorului atunci cand este necesar



UNIVERSITATEA BABEŞ-BOLYAI

Gelocalizare

- Putem gasi ultima locatie cunoscuta a dispozitivului prin apelul metodei GetLastKnownLocationAsync .
- Este mai rapida decat a executa o interogare noua, dar mai putin exact si poate returna null daca nu exista locatii salvate in cache

```
public async Task<string> GetCachedLocation()
{ try
{ Location location = await Geolocation.Default.GetLastKnownLocationAsync();
 if (location != null) return $"Latitude: {location.Latitude}, Longitude: {location.Longitude}, Altitude: {location.Altitude}";
 }
 catch (FeatureNotSupportedException fnsEx) { // Handle not supported on device exception }
catch (PermissionException pEx) { // Handle permission exception }
catch (Exception ex) { // Unable to get location }
 return "None"; }
```

UNIVERSITATEA BABEŞ-BOLYAI

Geolocalizare (II)

- Pentru a afla coordonatele locatiei curente utilizam **GetLocationAsync**

```
try {
var request = new
GeolocationRequest(GeolocationAccuracy.Medium);
var location = await
Geolocation.GetLocationAsync(request);
if (location != null) {
Console.WriteLine($"Latitude: {location.Latitude},
Longitude: {location.Longitude}, Altitude:
{location.Altitude}");
}
} catch (FeatureNotSupportedException fnsEx) { //
Handle not supported on device exception }
```

UNIVERSITATEA BABEŞ-BOLYAI

Acuratetea geolocalizarii

	Lowest	Low	Medium	High
Android	500	500	100-500	0-100
iOS	3000	1000	100	10
Windows	1000-5000	300-3000	30-500	<=10

UNIVERSITATEA BABEŞ-BOLYAI

Distanta intre doua locatii

- Clasa Location defineste metoda CalculateDistance – permite sa calculam distanta intre doua locatii geografice. Distanta calculata nu ia in considerare drumurile ci distanta intre doua puncte pe suprafata Pamantului

```
Location boston = new Location(42.358056, -71.063611);
Location sanFrancisco = new Location(37.783333, -122.416667);
double miles = Location.CalculateDistance(boston,
sanFrancisco, DistanceUnits.Kilometers);
```

UNIVERSITATEA BABEŞ-BOLYAI

Clasa Map (I)

- Permite unei aplicatii sa deschida o aplicatie de tip “harti” instalata la o locatie specificata
- Utilizeaza metoda OpenAsync cu parameterii de tip Location sau Placemark si optional un parametru de tip MapLaunchOptions

```
public class MapTest
{ public async Task NavigateToBuilding25() {
var location = new Location(47.645160, -122.1306032); var
options = new MapLaunchOptions { Name = "Microsoft Building
25" };
await Map.OpenAsync(location, options);
}
}
```

UNIVERSITATEA BABEŞ-BOLYAI

Clasa Map (II)

- Cand utilizam metoda OpenAsync cu un Placemark este necesara furnizarea urmatoarelor informatii:
  - CountryName
  - AdminArea
  - Thoroughfare
  - Locality

```
public class MapTest {
public async Task NavigateToBuilding25()
{ var placemark = new Placemark { CountryName =
"United States", AdminArea = "WA", Thoroughfare =
“Kingston Avenue", Locality = "Redmond" };
 var options = new MapLaunchOptions { Name =
"Microsoft Building 25" };
 await Map.OpenAsync(placemark, options); } }
```

UNIVERSITATEA BABEŞ-BOLYAI

Harta- mod navigare

- Daca se apeleaza OpenMapAsync fara parametrul MapLaunchOptions, harta va fi lansata cu locatia specificata. Optional putem sa calculam ruta de navigare din pozitia curenta la care se afla dispozitivul prin setare NavigationMode la MapLaunchOptions

```
public class MapTest {
public async Task NavigateToBuilding25()
{ var location = new Location(47.645160, -122.1306032);
var options = new MapLaunchOptions { NavigationMode =
NavigationMode.Driving };
await Map.OpenAsync(location, options); }
}
```

- NavigationMode suporta Bicycling, Driving si Walking

UNIVERSITATEA BABEŞ-BOLYAI