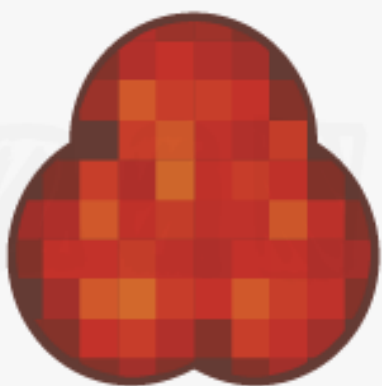




KulenDayz

IT INNOVATION CONFERENCE

Osijek, Croatia 01.-03.09.2023.

Thank you sponsors



Great job organizers & supporters!





KulenDayz

Build Web Apps with Blazor: .NET for Lazy (But Productive) Devs

Ricardo Cabral | www.rramoscabral.com | rramoscabral@rramoscabral.com

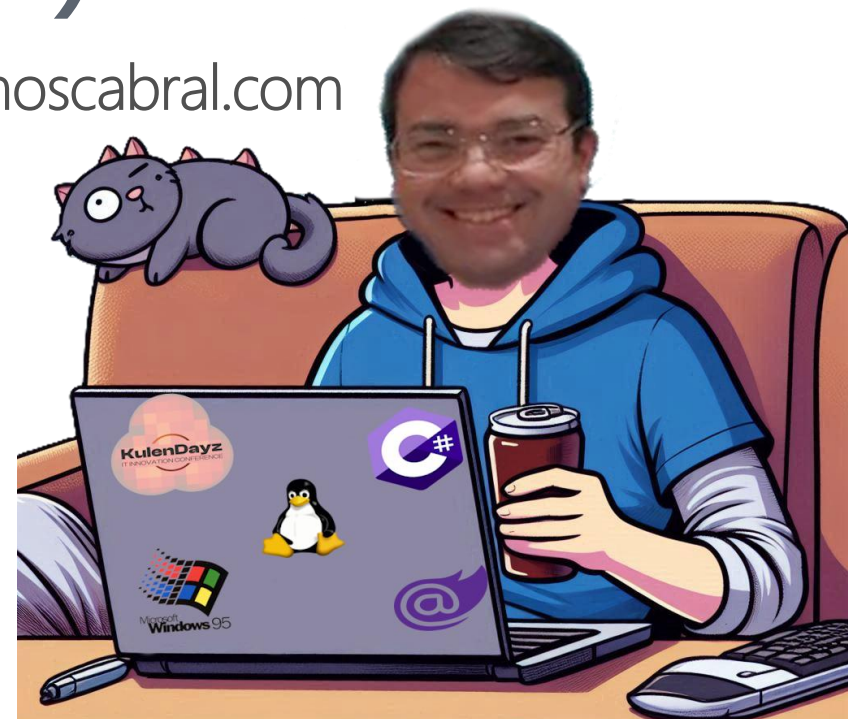
05.09.2025

🕒 15:00 - 15:50

DEVELOPMENT



Blazor





THIS IS NOT A COMMERCIAL SESSION!!!

Level 100 - Introductory

LET'S HAVE FUN TALKING ABOUT BLAZOR



Speaker Bio

- Ricardo Cabral
- From Portugal 
- Technical Consultant and Microsoft Certified Trainer
- Owner / Principal Consultant at NWORKIT.PT
- I also participate, volunteer and speak at community meetings.
- Hobbies
 - Coding
 - Cinema
 - Learning



<https://www.rramoscabral.com>
<https://LinkedIn.com/in/rrcabral>
rramoscabral@rramoscabral.com



Agenda

- Let's talk about Blazor
- Let's play an interactive quiz build in Blazor
- Q&A and discussions (If I still have time 🤗)

What is Blazor

“Blazor is a modern front-end web framework based on HTML, CSS, and C# that helps you build web apps faster.” from Microsoft.

- ASP.NET Core web UI framework
- Support server-side rendering and client interactivity in C#
- Single-page application (SPA) for WebApps using C#
- No JavaScript (or almost 😇, avoid JavaScript whenever possible!)
- Reuse your C# skills on the frontend for web, desktop and mobile 💪
- .NET community 👍

Three main models

- Blazor WebAssembly (WASM)
 - C# in the browser via WebAssembly
 - 100% client, offline possible
- Blazor Server
 - C# runs on the server via SignalR
 - Less consumption at the client side
- Blazor Hybrid
 - C# + .NET MAUI for desktop and mobile apps
 - Electron, MAUI cross-platform

```
dotnet new blazorwasm -o HelloBlazor
```

```
dotnet new blazorserver -o HelloBlazor
```

```
dotnet new maui-blazor -o HelloBlazor
```


Be careful with Classic Blazor WebAssembly

- Blazor WASM at .NET 5.0.9

The screenshot illustrates a common issue when working with Classic Blazor WebAssembly. It shows a network inspector with a list of requests. Two requests are highlighted: 'blazor.boot.json' and 'appsettings.json'. The 'appsettings.json' request is selected, and its raw data is displayed. The JSON data is as follows:

```
{  "AppSettings": {    "ApiBase": "https://localhost:5001/api",    "Logging": {      "LogLevel": {        "Default": "Information",        "Microsoft": "Warning",        "Microsoft.Hosting.Lifetime": "Information"      }    },    "AllowedHosts": "*"  },  "Logging": {    "LogLevel": {      "Default": "Information",      "Microsoft": "Warning",      "Microsoft.Hosting.Lifetime": "Information"    }  },  "AllowedHosts": "*"}
```

A red error message is visible in the JSON viewer: 'SyntaxError: JSON.parse: expected property name or \'}' at line 3 column 5 of the JSON data'. The error points to a line in the JSON that contains a redacted 'ApiBase' value.

Components

- Everything in the User Interface is a component.razor
- A component's name must start with an uppercase character

Life cycle	When should it be called	Observations
• OnInitialized • OnInitializedAsync	Only the first time the component is created in the navigation	Do not rerun when switching back to the same component in the same instance
• OnParametersSet • OnParametersSetAsync	Whenever parameters change (includes QueryString)	Rerun when returning to the component and if parameters change
• OnAfterRender (bool firstRender) • OnAfterRenderAsync(bool firstRender)	After the HTML is rendered into the DOM (Document Object Model)	Using firstRender to run only once or without firstRender for all renders

Data binding (@bind)

```
@page "/counter"

<h3>Counter with Data Binding</h3>

<p>Current value: @currentCount</p>
<button @onclick="IncrementCount">Increase</button>
<p> Your name: <input @bind="userName" /> </p>
<p> Welcome, @userName! </p>

@code {
    private int currentCount = 0;
    private string userName = "";

    private void IncrementCount() { currentCount++; }
}
```

Open-source UI component library for Blazor

- MudBlazor
 - Material Design component library
 - <https://github.com/MudBlazor/MudBlazor>
- Radzen Blazor
 - Material Design components library
 - <https://github.com/radzenhq/radzen-blazor>
- MatBlazor
 - Material Design components library
 - <https://github.com/SamProf/MatBlazor>

Data Passing between components

- @Parameter

- Communication between components in the same app
- Component1.razor send data to component2.razor

```
[Parameter]  
public int Value { get; set; }
```

- EventCallback

- Events from component1.razor to component2.razor

```
[Parameter]  
public EventCallback OnSave  
{ get; set; }
```

- CascadingParameter

- Share values across multiple components

State Management

- StateHasChanged
 - Forces an interface update
- Cascading Parameters
 - Share data without manually passing parameters
- Services (Dependency Injection)
 - Business logic

```
private async Task IncrementAsync()
{
    await Task.Delay(1000);
    count++;
    StateHasChanged(); // Updates the UI
}
```


Render as HTML instead of literal text

```
@CurrentQuestion.Options[i]
@((isCorrect ? "✔" :
  "✖"))
```

```
@((MarkupString)(isCorrect ? "
  "✔" : " "✖"))
```

What is the capital of Portugal?

Lisboa ✔ 0 respostas

Porto ✖ 1 respostas

Faro ✖ 0 respostas

Braga ✖ 0 respostas

☒ Lisboa 0 == 0 ? "✓" : "✗"

☐ Porto 0 == 1 ? "✓" : "✗"

☐ Faro 0 == 2 ? "✓" : "✗"

☐ Braga 0 == 3 ? "✓" : "✗"

What is the capital of Portugal?

Lisboa ✓ 0 respostas

Porto ✗ 1 respostas

Faro ✗ 0 respostas

Braga ✗ 0 respostas

☒ Lisboa ✓

☐ Porto ✗

☐ Faro ✗

☐ Braga ✗

JavaScript interoperability (JS interop)

- Invoke JavaScript (JS) functions

```
@inject IJSRuntime JS
```

```
<button @onclick="ShowMessage">Show Alert</button>
```

```
@code {
```

```
    private async Task ShowMessage()
```

```
    { await JS.InvokeVoidAsync("showAlert", "Hello from Blazor!"); }
```

```
}
```

```
private async Task LogToConsole() {
```

```
    await JS.InvokeVoidAsync("console.log", "Hello from Blazor to the browser console!");
```

```
}
```

Local events

- Singleton or Scoped services allow triggering and listening for changes within the same application.
 - Singleton: single and shared instance created once and reused (e.g. logging)
 - Scoped: created per circuit (user session) ideal for per-session state
- Internal communication between components
- Traffic is local to the Blazor Server context (circuit)
- Propagation of changes and commands occurs on the server side, using the same services

Passing data in real time with SignalR

- Real-time communication
- Persistent WebSocket connections or fallback for instant notifications
- SignalR maintains an active WebSocket connection between clients

Broadcasting and targeting messages with SignalR

- Clients.Group: sends messages to the caller named group
- Clients.Caller: sends messages to the caller only
- Clients.All: broadcast a global message to all connected clients
- And more...

```
public async Task BroadcastMessage(string message)
{
    await Clients.All.SendAsync("ReceiveMessage", message);
}
```

```
public async Task SendPrivateConfirmation(string message)
{
    await Clients.Caller.SendAsync("ReceiveMessage", $"You sent: {message}");
}
```

Real-Time updates without rendering resets

- Don't reload component just to update its data.
- The UI should remain stable while the data updates.
- Separating data logic from the view allows smooth updates.
- Updating without reinitializing the interface improves user experience.

Fallback endpoint

- Classic Blazor Server
 - The pipeline uses `app.MapFallbackToPage("/_Host")`.
 - Fallback route: `Pages/_Host.cshtml`
- Blazor Web App .NET 8 or 9
 - Error: *System.InvalidOperationException: Cannot find the fallback endpoint specified by route values: { page: /_Host, area: }*
 - No longer uses: `MapBlazorHub()` or `MapFallbackToPage` or `/_Host.cshtml`
 - Instead: `MapFallbackToFile("index.html")`

Fallback endpoint (continue)

- Blazor Web App .NET 8 or 9 renders component from root App

```
app.MapRazorComponents<App>()  
    .AddInteractiveServerRenderMode();
```

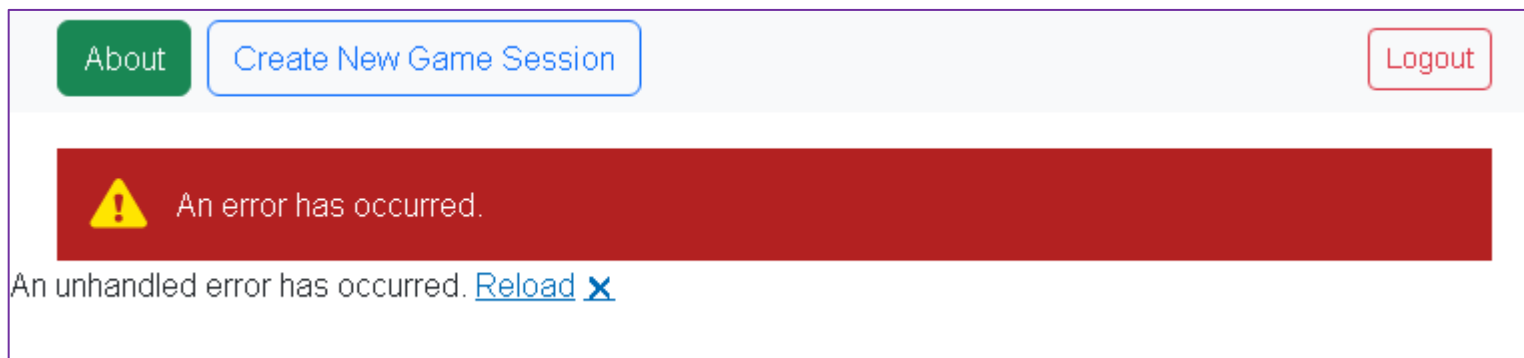
- *MapRazorComponents<App>()*
 - Renders Razor components as pages
- *AddInteractiveServerRenderMode()*
 - Enables server-side UI events and interactivity via SignalR
 - No need to use *app.MapBlazorHub()* and *app.MapFallbackToPage("/_Host")*

ErrorBoundary

- Catches unhandled exceptions during rendering or events

```
<ErrorBoundary>  
  @Body  
</ErrorBoundary>
```

- Displays a friendly error UI and you can provide custom error



ErrorBoundary in layout

```
<ErrorBoundary>
  <ChildContent>
    @Body
  </ChildContent>
  <ErrorContent>
    <p class="text-danger">An error occurred: @context.Message</p>
    <pre>@context.StackTrace</pre>
  </ErrorContent>
</ErrorBoundary>
```

[About](#) [Create New Game Session](#) [Logout](#)

An error occurred: The property 'CurrentSession' on component type 'QuizOnBlaze.Components.Layout.AdminLayout' cannot be set explicitly because it only accepts cascading values.

```
at Microsoft.AspNetCore.Components.Reflection.ComponentProperties.ThrowForSettingC
at Microsoft.AspNetCore.Components.Reflection.ComponentProperties.SetProperties(Pa
at Microsoft.AspNetCore.Components.LayoutComponentBase.SetParametersAsync(Paramete
at Microsoft.AspNetCore.Components.Rendering.ComponentState.SupplyCombinedParamete
```

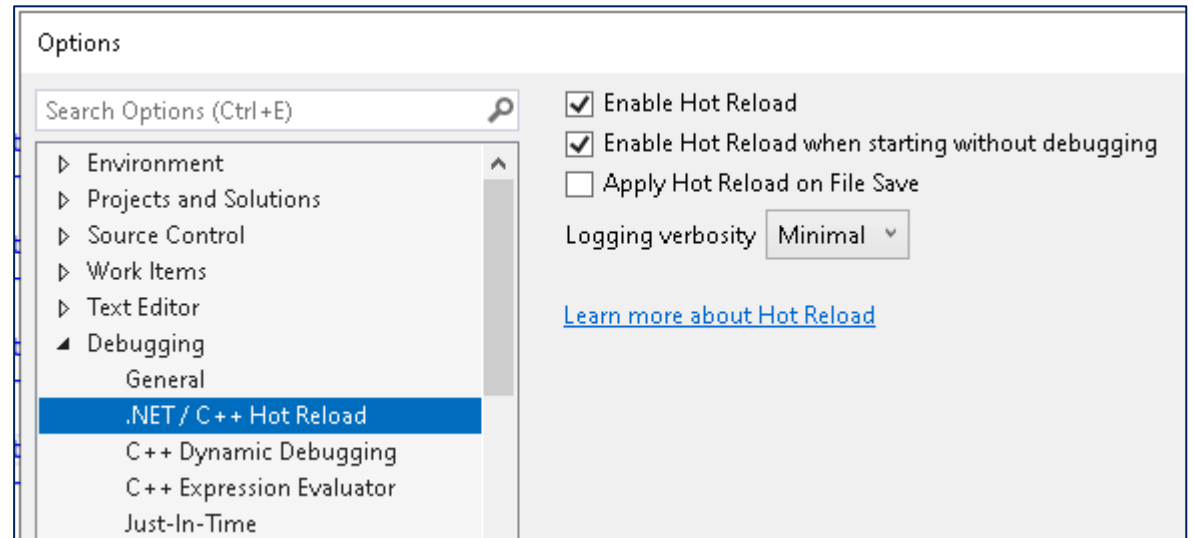
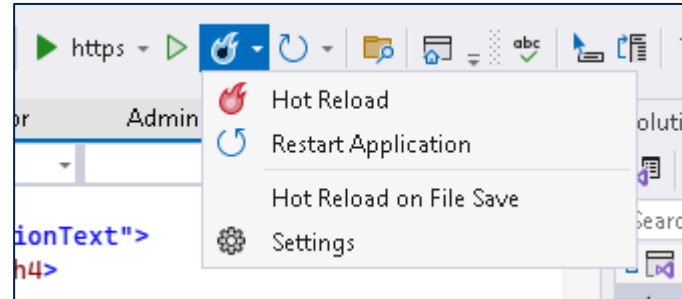
An unhandled error has occurred. [Reload](#) X

ErrorBoundary can make the following static in custom layout

```
<div id="blazor-error-ui">
  An unhandled error has occurred.
  <a href="" class="reload">Reload</a>
  <a class="dismiss">X</a>
</div>
```

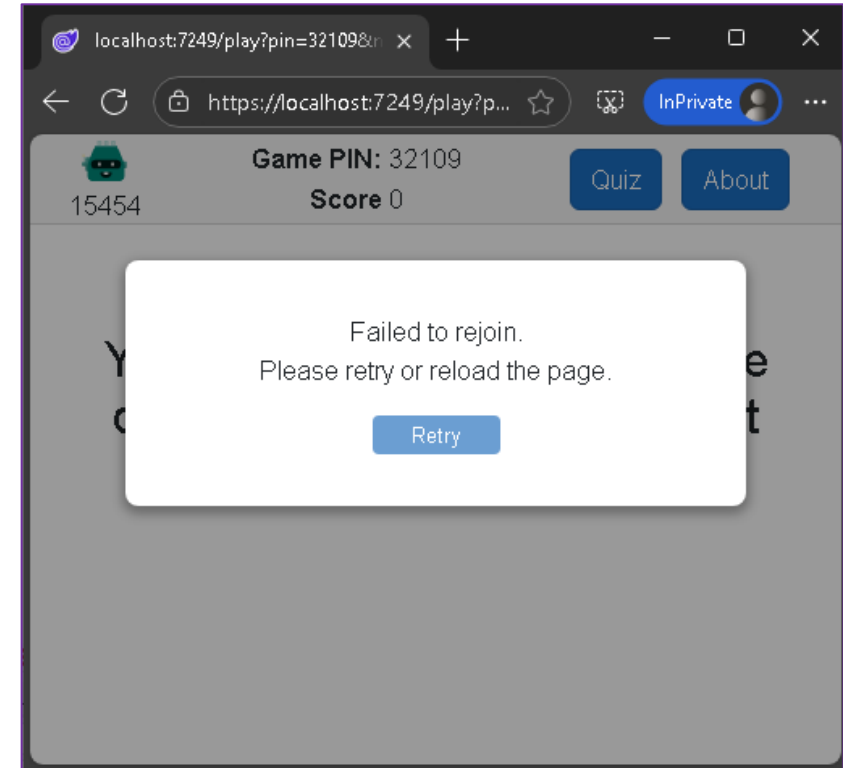
Hot Reload

```
// .vscode/tasks.json
{
  "version": "2.0.0",
  "tasks": [
    {
      "label": "Run with Hot Reload",
      "type": "shell",
      "command": "dotnet watch run",
      "problemMatcher": [],
      "group": {
        "kind": "build",
        "isDefault": true
      }
    }
  ]
}
```



Hot Reload (continuing)

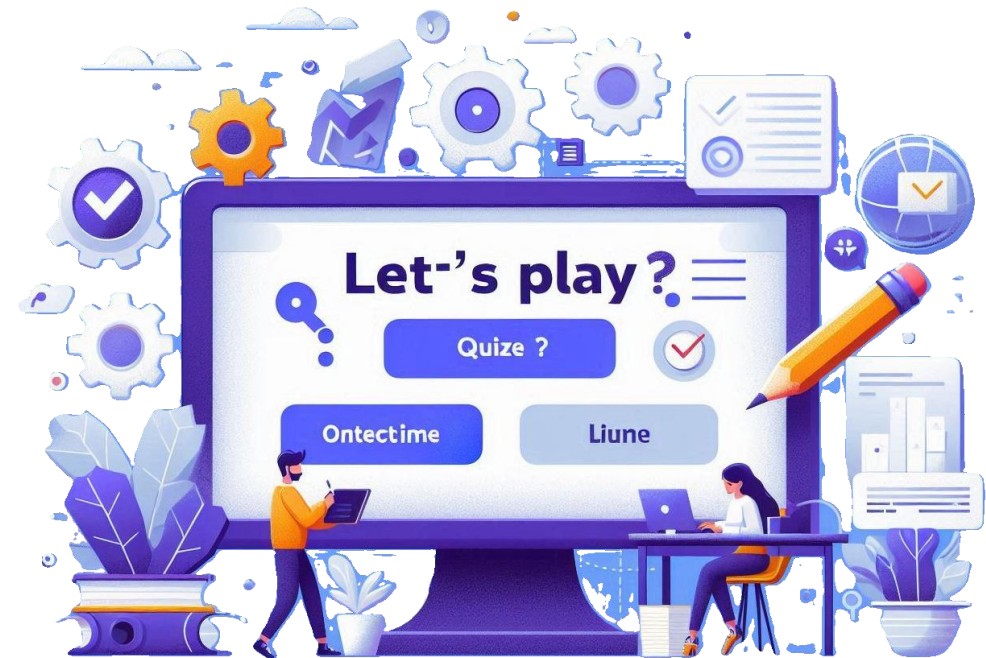
- ENC0047: Changing visibility of method requires restarting the application.
- ENC0085: Changing method from asynchronous to synchronous requires restarting the application.



Use Artificial Intelligence to create Blazor Web Apps

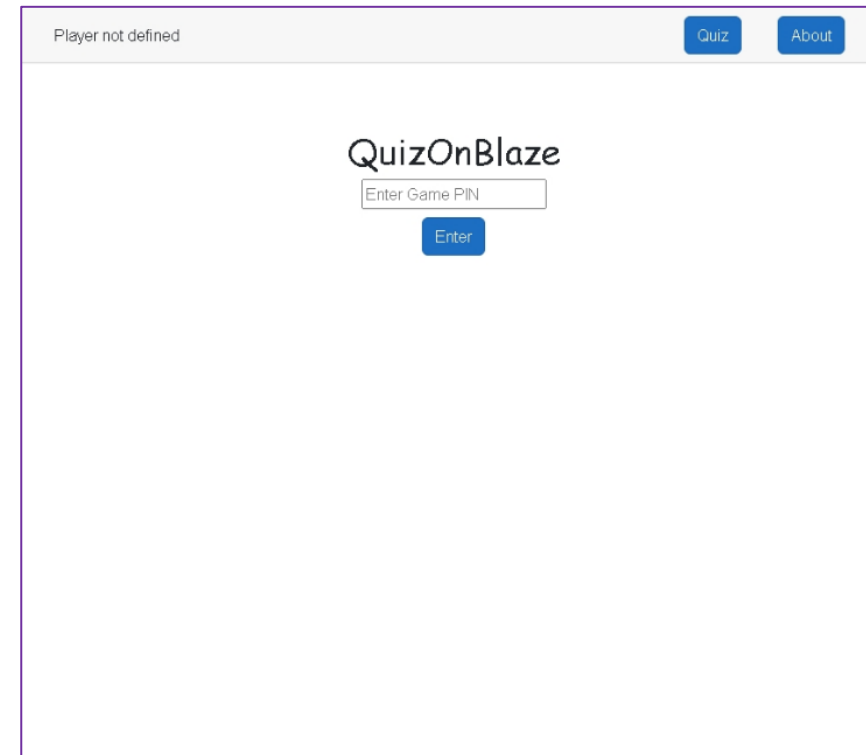
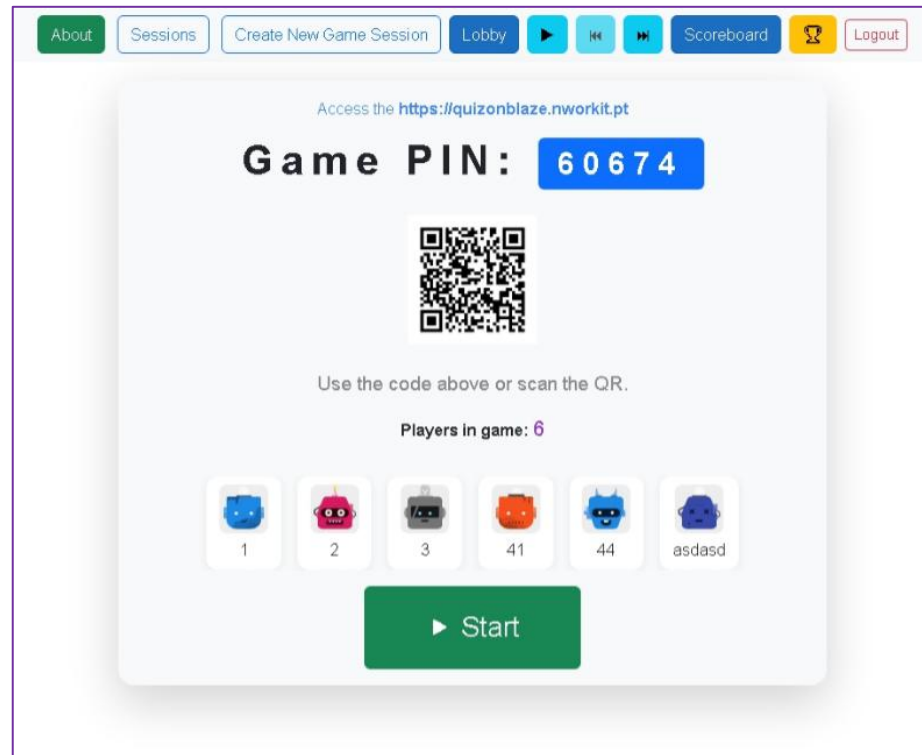
- Trained for Blazor Classic server
- Prompt engineering
- Coding models
 - Claude 3.5 / 3.7
 - ChatGPT 4.5 / 5
 - OpenAI o3-mini
 - DeepSeek r1
 - Llama-3-Groq-70B
 - And more ...
- You can use AI for:
 - Code Generation -> GitHub Copilot
 - Code Completion -> GitHub Copilot
 - Code Explanation -> CodeGeeX
 - Code Debugging -> AskCodi
 - Code Review -> Aikido Security

Let's play an interactive quiz build in Blazor



Let's play an interactive quiz build in Blazor

- <https://QuizOnBlaze.nworkit.pt>



Slides

- Slides available here:

<https://rramoscabral.com/en/sessions.html>



Ricardo Cabral
Microsoft Certified Trainer (MCT) | IT
Trainer | IT Consultant | Owner / Principal
Consultant at [NWORKIT.PT](#)
Lisbon, Portugal

[in LinkedIn](#)
[X @rramoscabral](#)
[GitHub](#)
[Youtube](#)
[Company](#)

[My Certifications](#)
[My Sessions](#)
[Resources for students](#)
[My Professional Titles](#)

My sessions in technical communities and events

Present sessions were held free of charge for technical communities or events.

You can filter them through the following topics:

[See all](#) [Artificial Intelligence \(AI\)](#) [Developer](#) [Microsoft 365](#) [Microsoft Azure & Cloud](#) [Microsoft Power Platform](#)
[Microsoft PowerShell](#) [Microsoft Windows](#) [Microsoft Windows Server](#) [SQL & Database](#) [Others](#)



Evento de 2ª Edição
BACC
BRAZIL ANGOLA CLOUD CONNECTION

Designing and Deploying Custom Connectors
Event: BRAZIL ANGOLA CLOUD CONNECTION
Location: Online
Date: 2025-05-23
Language: Portuguese
Tags: Power Automate
[Not available](#)



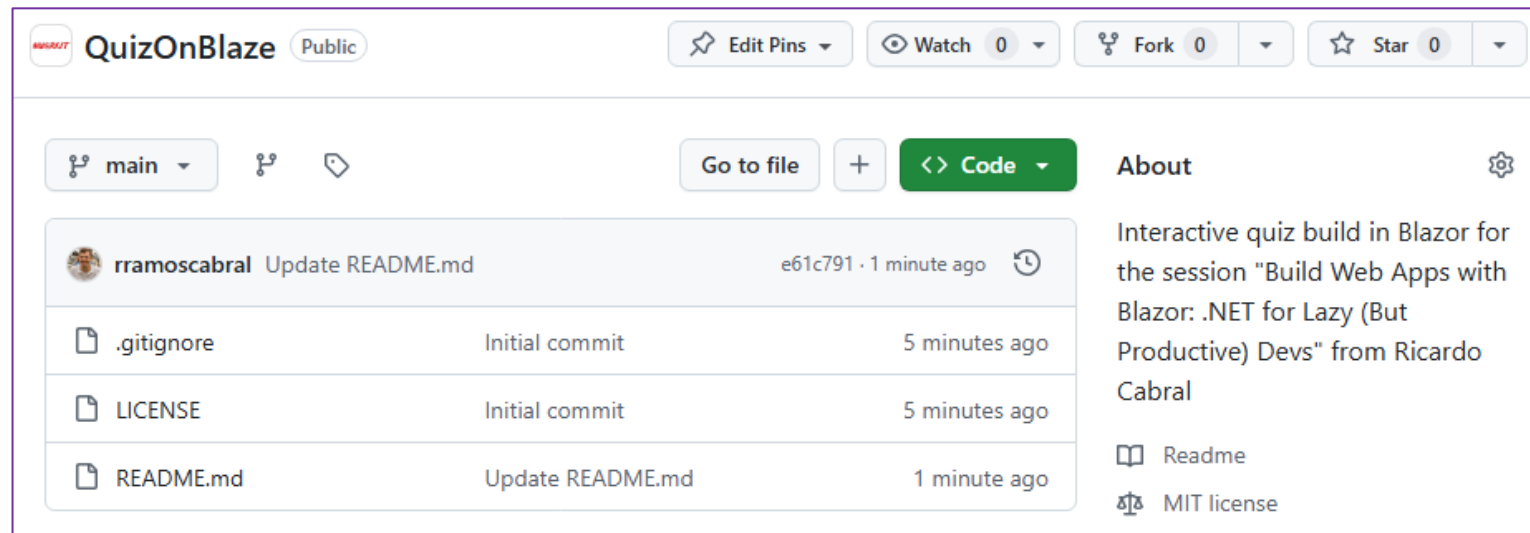
Hacking? Mission Possible!
Event: TechEd československá IT konference
Location: Praha, Česká republika
Date: 2025-05-21
Language: English
Tags: Security
[Not available](#)



Designing and Deploying Custom Connectors
Event: TechEd československá IT konference
Location: Praha, Česká republika
Date: 2025-05-21
Language: English
Tags: Power Automate
[Not available](#)

QuizOnBlaze source code

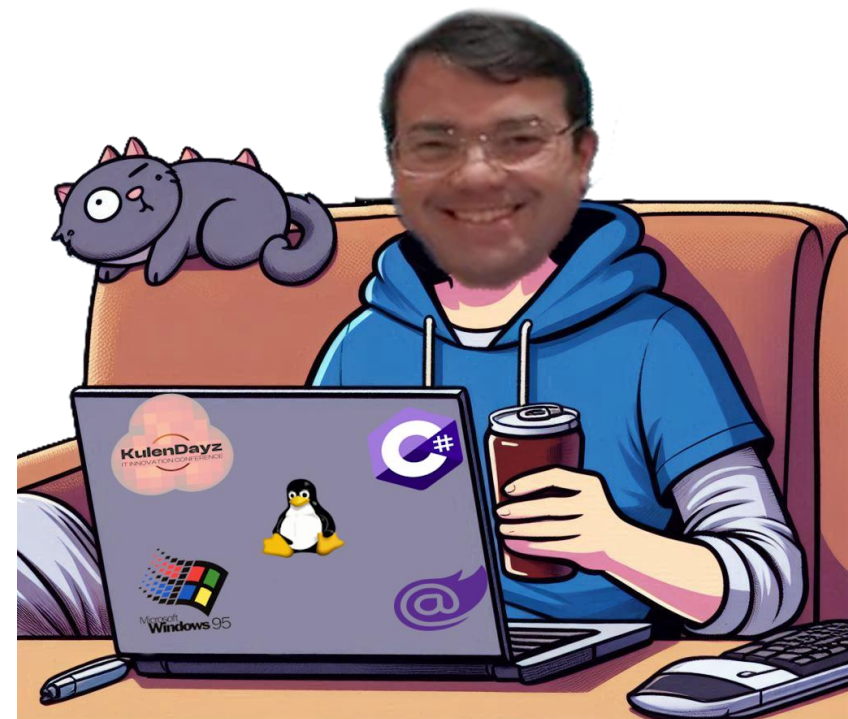
- QuizOnBlaze source code available here:
<https://github.com/NWORKIT/QuizOnBlaze>

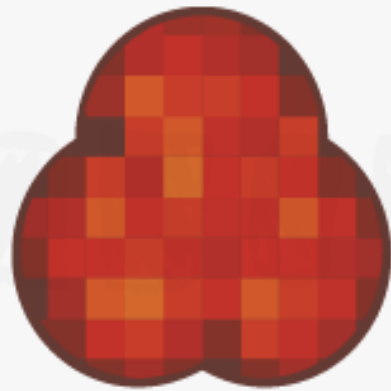




<https://www.rramoscabral.com>
<https://LinkedIn.com/in/rrcabral>
rramoscabral@rramoscabral.com

THANK YOU





Thanks
for slowing down
and listening :-)

#bećarenje #kulendayz

NW@RKIT®