Project Overview — Detailed with Technologies

Solution Structure

/IoTAnomalyDetection

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├/DeviceSimulator # Simulated sensor client (Console App)

├/MLModel # ML.NET model training + inference (Class Library)

├/BackendAPI # ASP.NET Core API

├/Dashboard # Blazor Server

├/Shared # Shared Class Library

Technologies Used

Area	Technology	Purpose
UI Framework	**Blazor** (likely WebAssembly or Server)	Component-based UI in C#
Real-Time Messaging	**SignalR (ASP.NET Core)**	Pushes live sensor updates to dashboard
Shared Contracts	**Shared Class Library (.NET)**	SensorData model shared between projects
Communication	**SignalR Client Library** (Microsoft.AspNetCore.SignalR.Client)	Real-time client
Backend Hosting	ASP.NET Core Web App	Hosts SignalR Hub
Styling	Basic CSS / Bootstrap	Layout and UI styling

Key Files / Components

- SensorDashboard.razor: Blazor page that displays sensor data
- SensorData.cs: Shared data contract for signal messages
- SensorController.cs: SignalR Hub broadcasting messages
- Program.cs: Configures SignalR hub and services
- SensorSender.cs: Stores and updates sensor info live

Features Currently Implemented

Real-time updates of sensor values
UI updates on new data using SignalR
Visual indicator for anomaly detection (IsAnomaly)
Sorted view of sensors by ID

Future Enhancements (Optional)

Feature	Description
Charting	Add dynamic charts using ChartJs.Blazor.Fork or switch to **Syncfusion**, **LiveCharts2**, or **Plotly.NET** for easier integration
Sensor Categories	Group sensors by type/location
History View	Display time-series or past data with filtering
Anomaly Analytics	Add chart threshold zones or ML-based detection
Authentication	Secure SignalR endpoints using **JWT** or **Azure AD**
Deployment	Host in **Azure App Service**, **Docker**, or **AWS**
Notification System	Toasts/email alerts on anomalies
Data Storage	Save historical data in **SQLite**, **PostgreSQL**, or **InfluxDB**
Dashboard UX	Use **MudBlazor** or **Radzen** for rich UI widgets
Offline Support	Enable caching using IndexedDB for Blazor WASM
Mobile View	Responsive design for tablets or mobile use
