Backend visualization Dataset

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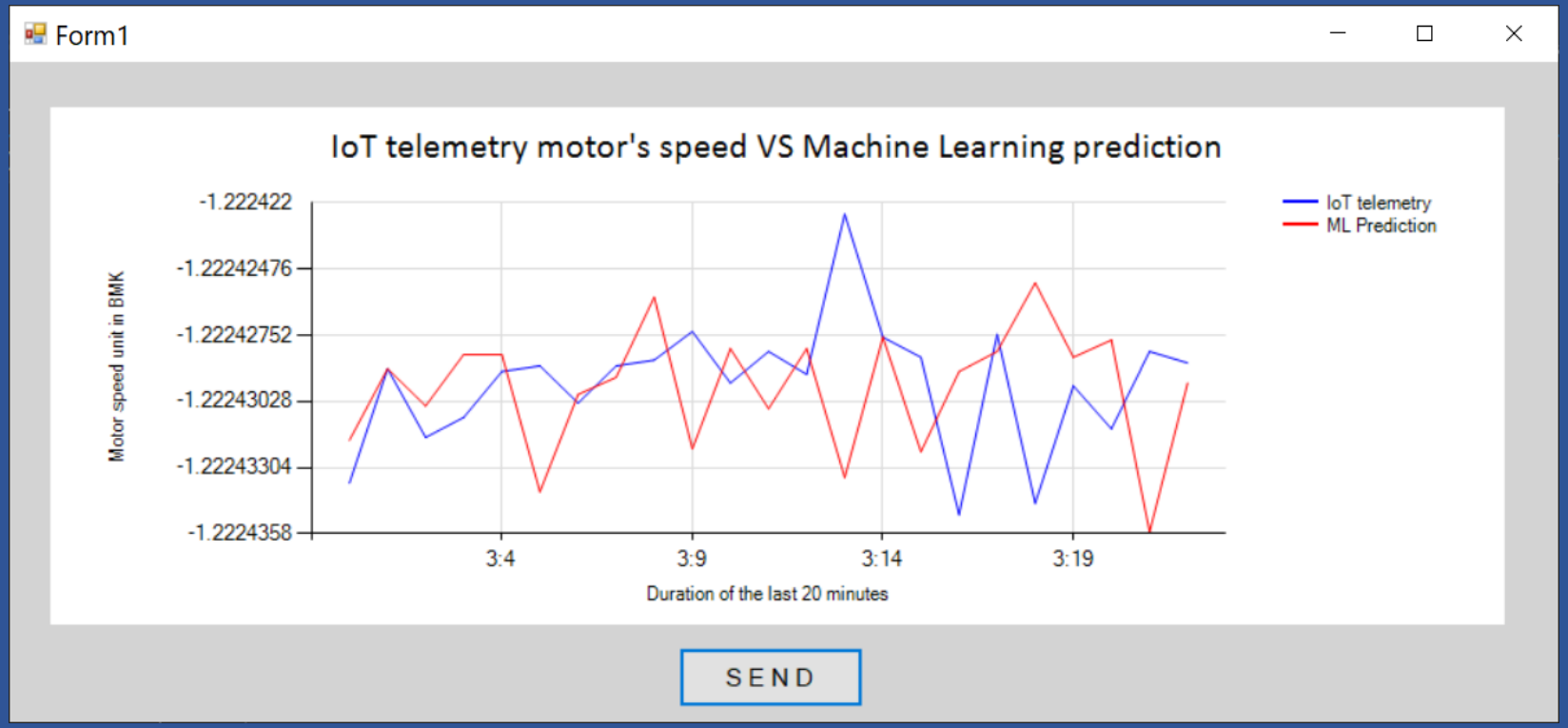
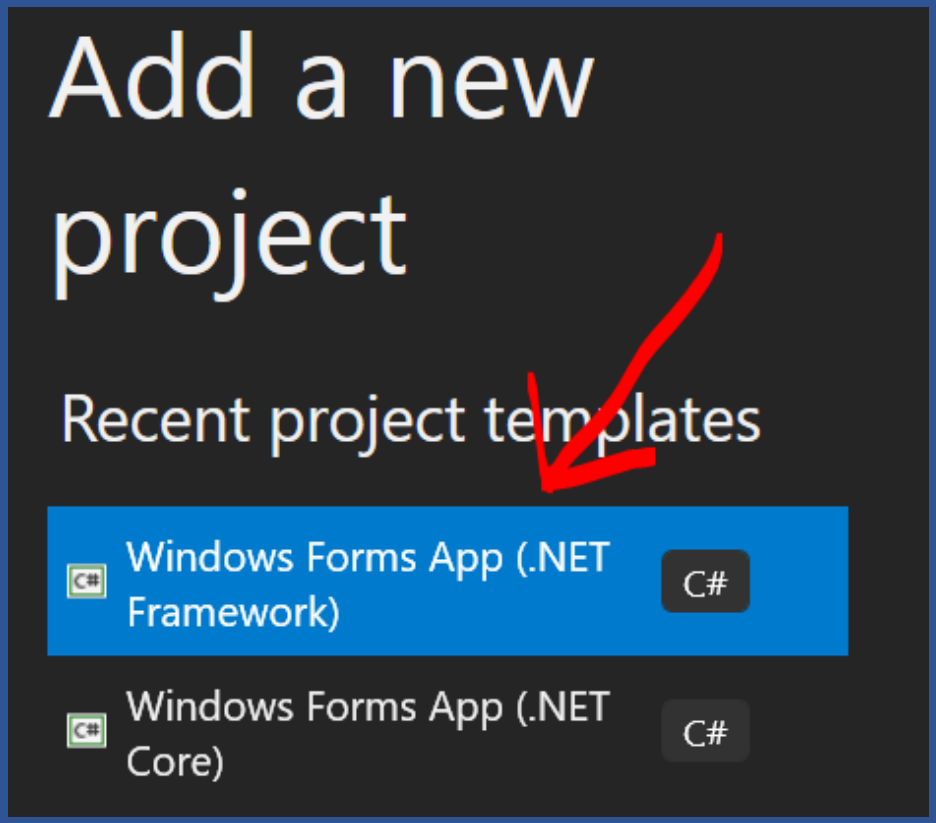
Create WinForm show line chart from Dataset



Open Visual Studio / Create C# .NET Framework WinForm



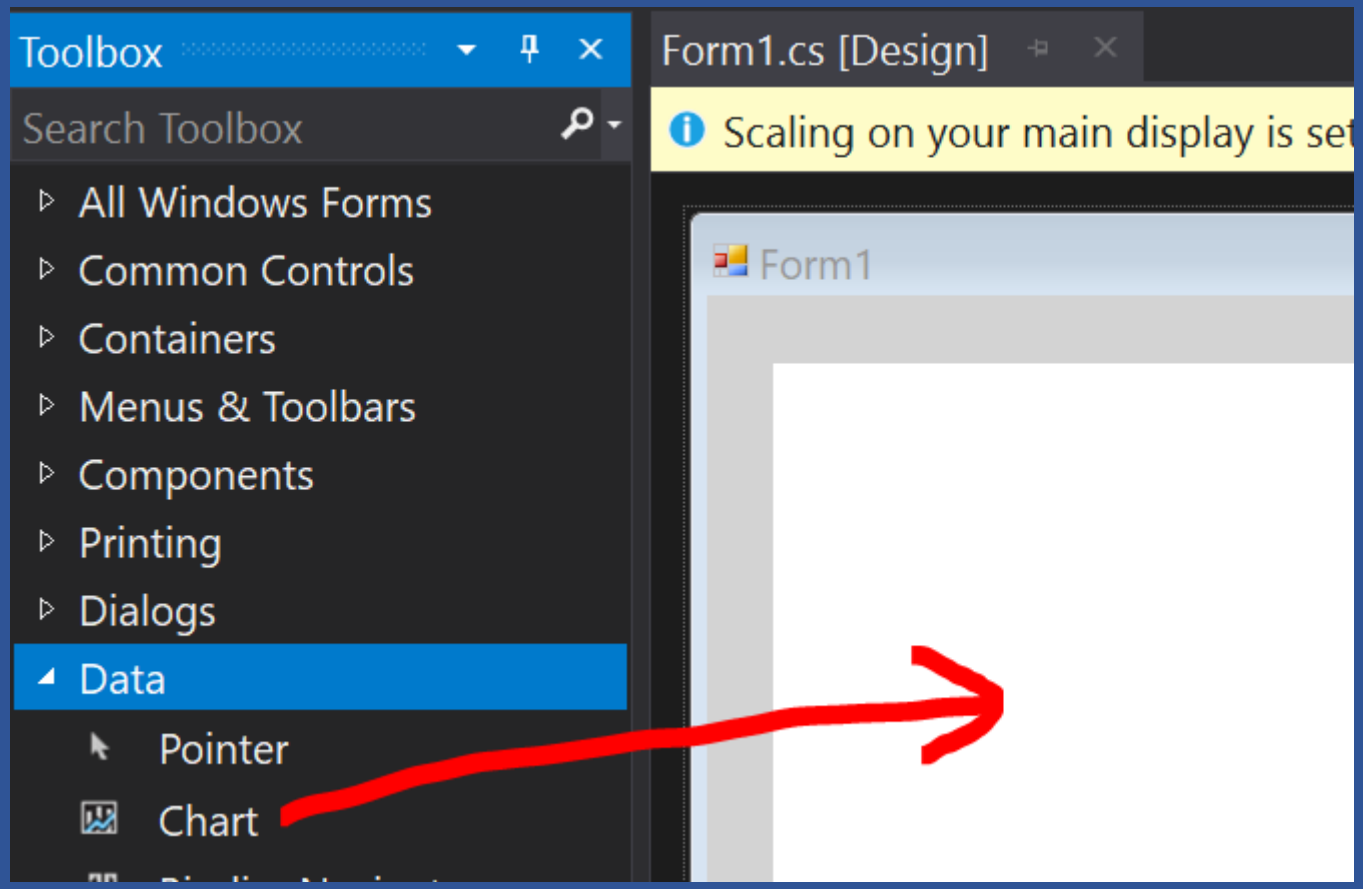
Add Namespace

```
using System;
using System.Drawing;
using System.Windows.Forms;
using System.Windows.Forms.DataVisualization.Charting;
using System.IO;
using System.Collections.Generic;
```

Add class members

```
private static List<string[]> datasetIoT;
private static List<string[]> datasetML;
private static int dataCounter = 0;
```

Drag Chart control to Form1



Add method ReadCSV()

```
20      private static void ReadCSV()
21      {
22          using (var reader = new StreamReader(
23              @"g:\temp\pmsm_temperature_data_test.csv"))
24          {
25              datasetIoT = new List<string[]>();
26              datasetML = new List<string[]>();
27              int counter = 0;
28
29              while (!reader.EndOfStream)
30              {
31                  var line = reader.ReadLine();
32                  var values = line.Split(',');
33                  if(counter++ < 40)
34                      datasetIoT.Add(values);
35                  else
36                      datasetML.Add(values);
37                  if (counter >= 80) break;
38              }
39          }
40      }
```

Add method SetChartArea()

```
41      private void SetChartArea()
42      {
43          Title title1 = new Title();
44          title1.Font = new Font("Calibri", 16.2F, FontStyle.Regular,
45              GraphicsUnit.Point, ((byte)(0)));
46          title1.Name = "Title1";
47          title1.Text = "IoT telemetry motor's speed VS Machine Learning prediction";
48          this.chart1.Titles.Add(title1);
49
50          chart1.ChartAreas[0].AxisX.Title = "Duration of the last 20 minutes";
51          chart1.ChartAreas[0].AxisX.TitleAlignment = StringAlignment.Center;
52          chart1.ChartAreas[0].AxisX.TextOrientation = TextOrientation.Horizontal;
53          chart1.ChartAreas[0].AxisX.MajorGrid.LineColor = Color.Gainsboro;
54
55          chart1.ChartAreas[0].AxisY.Title = "Motor speed unit in BMK";
56          chart1.ChartAreas[0].AxisY.TitleAlignment = StringAlignment.Center;
57          chart1.ChartAreas[0].AxisY.TextOrientation = TextOrientation.Rotated270;
58          chart1.ChartAreas[0].AxisY.MajorGrid.LineColor = Color.Gainsboro;
59          chart1.ChartAreas[0].AxisY.Maximum = -1.22242200;
60          chart1.ChartAreas[0].AxisY.Minimum = -1.2224358;
61
62          var speedSeries1 = new Series("IoT");
63          speedSeries1.ChartType = SeriesChartType.Line;
64          speedSeries1.Color = Color.Blue;
65          chart1.Series.Add(speedSeries1);
66          chart1.Series["IoT"].LegendText = "IoT telemetry";
67
68          var speedSeries2 = new Series("ML");
69          speedSeries2.ChartType = SeriesChartType.Line;
70          speedSeries2.Color = Color.Red;
71          chart1.Series.Add(speedSeries2);
72          chart1.Series["ML"].LegendText = "ML Prediction";
73      }
```

Add method IoTLine()

```
74      private void IoTLine()
75      {
76          List<double> yl = new List<double>();
77          List<string> xl = new List<string>();
78          for (int i = 0; i < dataCounter; i++)
79          {
80              var v = datasetIoT[i+1];
81              yl.Add(float.Parse(v[4]));
82              xl.Add($"3:{i}");
83          }
84          chart1.Series["IoT"].Points.DataBindXY(xl, yl);
85      }
```

Add method MLLine()

```
86      private void MLLine()
87      {
88          List<double> yl = new List<double>();
89          List<string> xl = new List<string>();
90          for (int i = 0; i < dataCounter; i++)
91          {
92              var v = datasetML[i + 1];
93              yl.Add(float.Parse(v[4]));
94              xl.Add($"3:{i}");
95          }
96          chart1.Series["ML"].Points.DataBindXY(xl, yl);
97      }
```

Add code to Form1_Load and buttonSend_Click

```
98      private void Form1_Load(object sender, EventArgs e)
99      {
100         ReadCSV();
101         SetChartArea();
102     }
103     private void buttonSend_Click(object sender, EventArgs e)
104     {
105         if (++dataCounter > 39) dataCounter = 0;
106         MLLine();
107         IoTLine();
108     }
109 }
```

What's next?