Backend visualization

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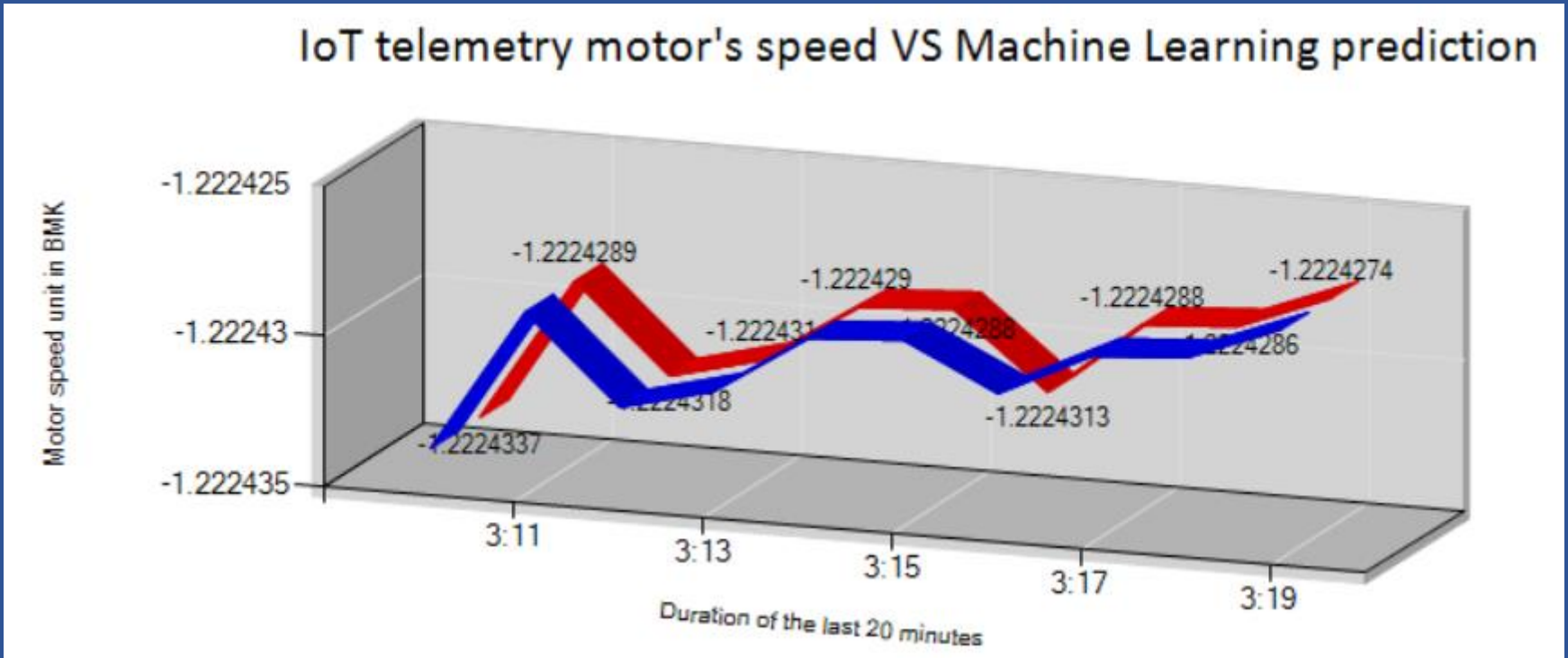
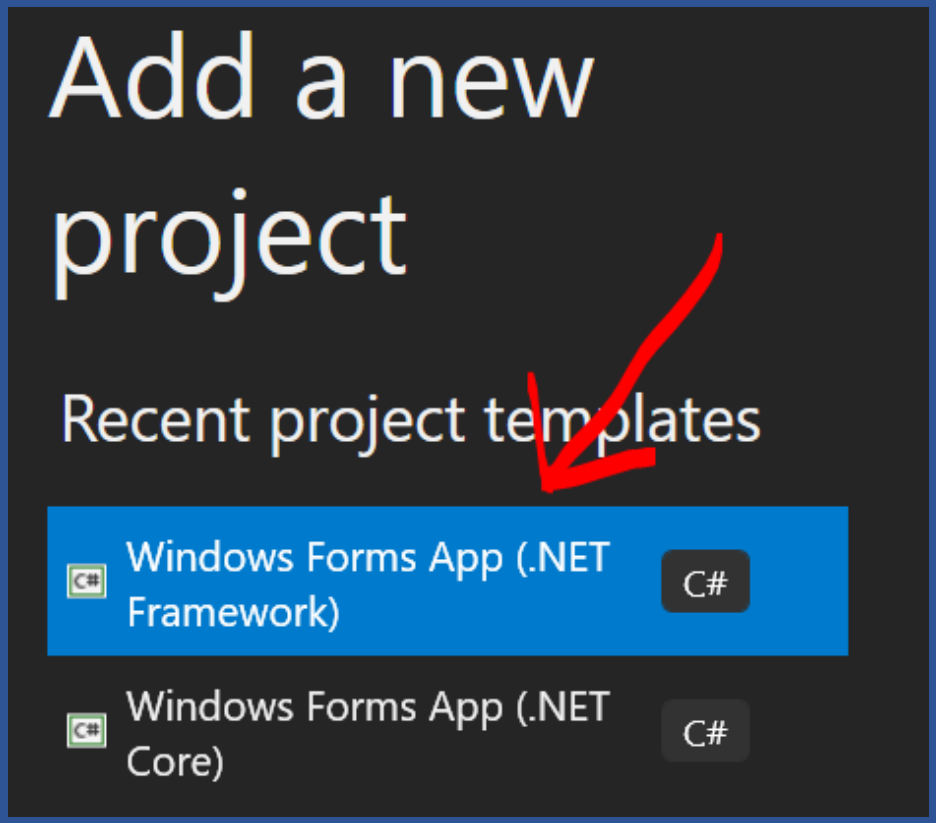
Create WinForm show line chart from example IoT data



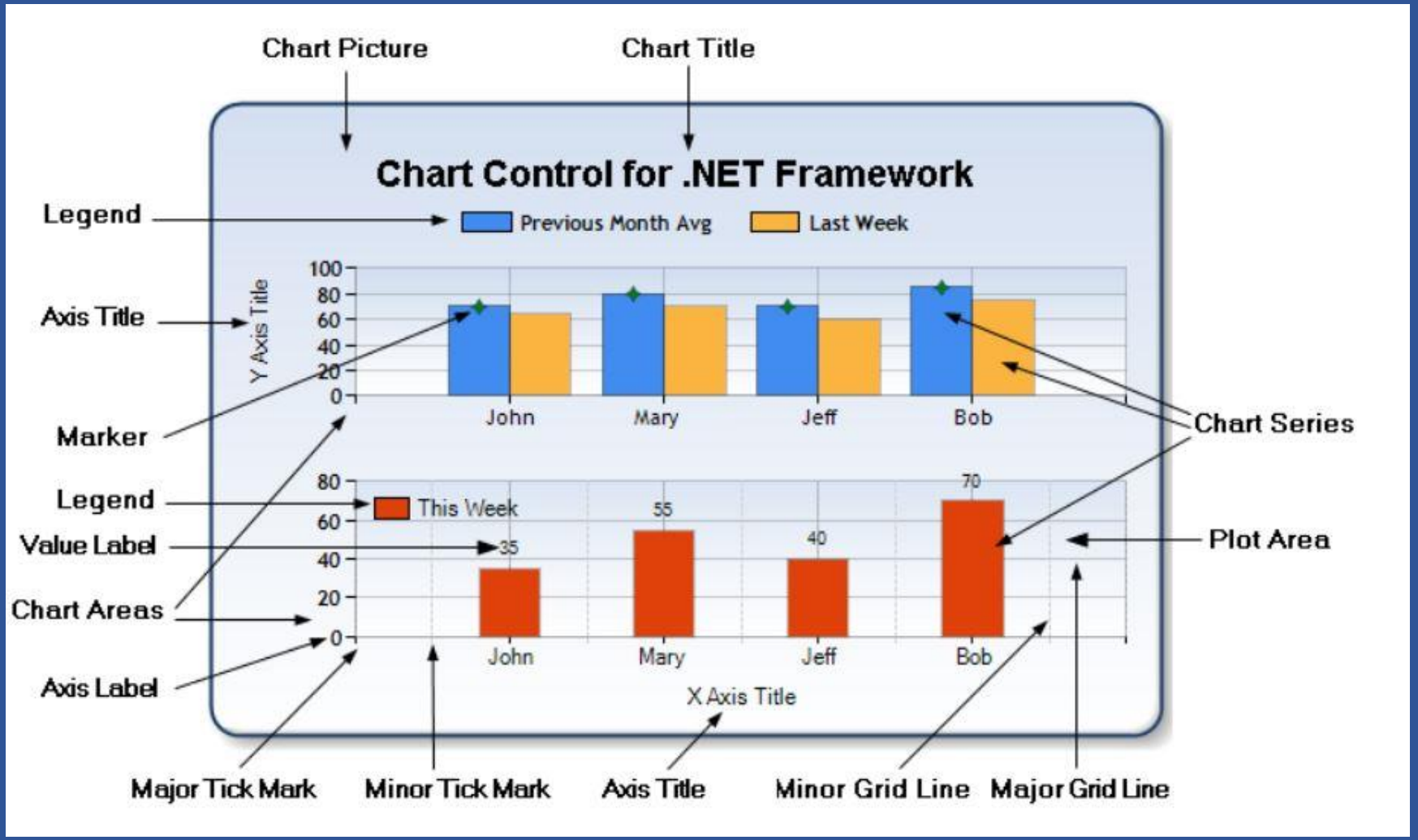
Open Visual Studio / Create C# .NET Framework WinForm



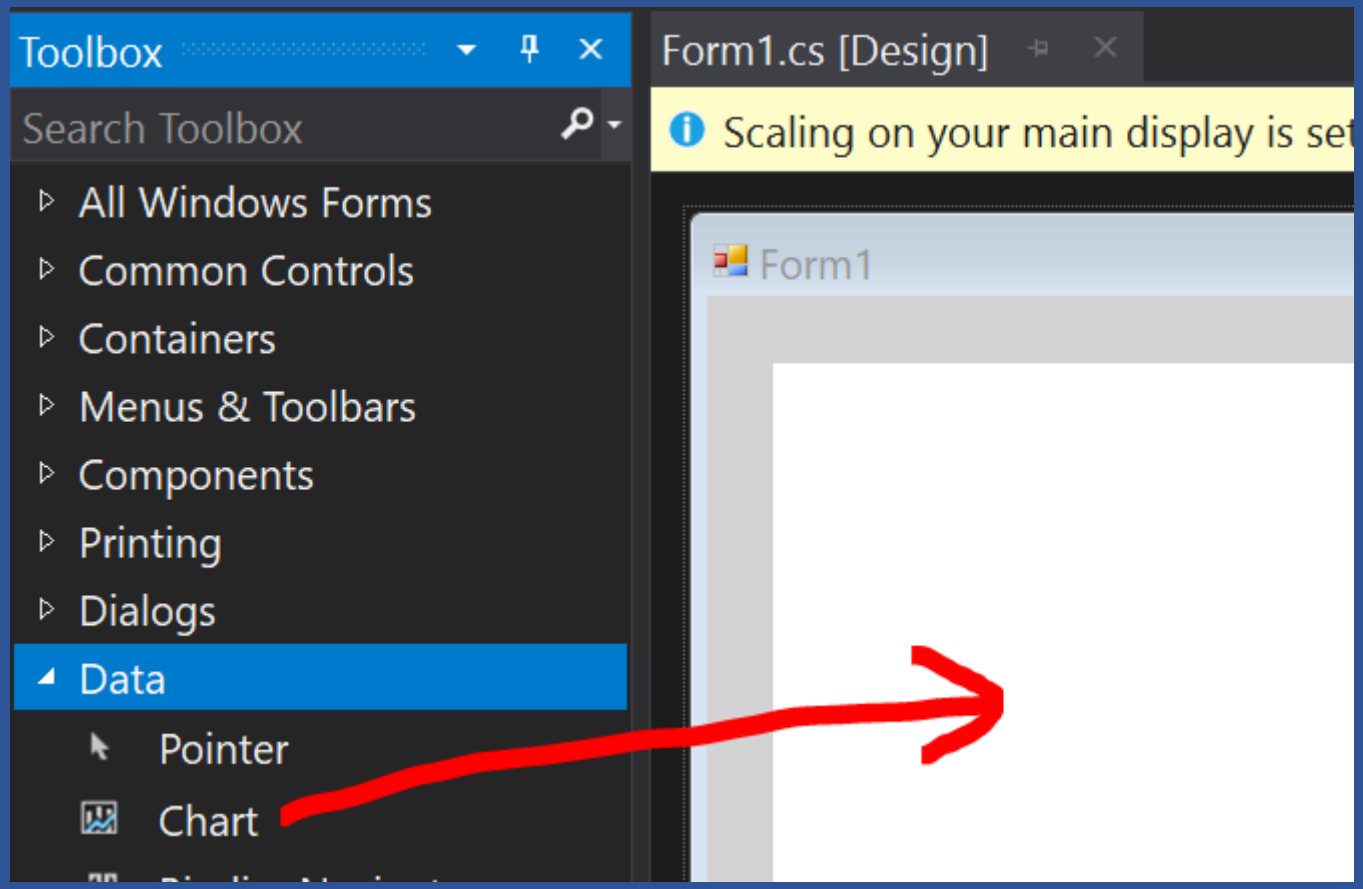
Add Namespace

```
1   using System;
2   using System.Drawing;
3   using System.Windows.Forms;
4   using System.Windows.Forms.DataVisualization.Charting;
5
```

Chart control



Drag Chart control to Form1



Add method SetChartArea()

```
14      private void SetChartArea()
15      {
16          Title title1 = new Title();
17          title1.Font = new Font("Calibri", 16.2F, FontStyle.Regular,
18              GraphicsUnit.Point, ((byte)(0)));
19          title1.Name = "Title1";
20          title1.Text = "IoT telemetry motor's speed VS Machine Learning prediction";
21          this.chart1.Titles.Add(title1);
22
23          chart1.ChartAreas[0].AxisX.MajorGrid.LineColor = Color.Gainsboro;
24          chart1.ChartAreas[0].AxisY.MajorGrid.LineColor = Color.Gainsboro;
25          chart1.ChartAreas[0].AxisY.Maximum = -1.2224250;
26          chart1.ChartAreas[0].AxisY.Minimum = -1.2224350;
27
28          chart1.ChartAreas[0].AxisX.Title = "Duration of the last 20 minutes";
29          chart1.ChartAreas[0].AxisX.TitleAlignment = StringAlignment.Center;
30          chart1.ChartAreas[0].AxisX.TextOrientation = TextOrientation.Horizontal;
31
32          chart1.ChartAreas[0].AxisY.Title = "Motor speed unit in BMK";
33          chart1.ChartAreas[0].AxisY.TitleAlignment = StringAlignment.Center;
34          chart1.ChartAreas[0].AxisY.TextOrientation = TextOrientation.Rotated270;
35
36          chart1.ChartAreas[0].Area3DStyle.Enable3D = true;
37          chart1.ChartAreas[0].Area3DStyle.IsRightAngleAxes = false;
38          chart1.ChartAreas[0].Area3DStyle.Inclination = 40;
39          chart1.ChartAreas[0].Area3DStyle.Rotation = 20;
40      }
```

Add method IoTLine()

```
41      private void IoTLine()
42      {
43          double[] yval = { -1.2224337, -1.2224289, -1.2224318, -1.222431,
44              -1.222429, -1.2224288, -1.2224303, -1.2224288, -1.2224286, -1.2224274 };
45
46          string[] xval = { "3:10", "3:11", "3:12", "3:13", "3:14",
47              "3:15", "3:16", "3:17", "3:18", "3:19"};
48
49          var speedSeries1 = new Series("IoT");
50          speedSeries1.ChartType = SeriesChartType.Line;
51          speedSeries1.Color = Color.Blue;
52          chart1.Series.Add(speedSeries1);
53          chart1.Series["IoT"].Points.DataBindXY(xval, yval);
54          chart1.Series["IoT"].LegendText = "IoT telemetry";
55      }
```

Add method MLLine()

```
56      private void MLLine()
57      {
58          double[] yval = { -1.2224337, -1.2224289, -1.2224318, -1.222431,
59              -1.222429, -1.2224288, -1.2224313, -1.2224288, -1.2224286, -1.2224274 };
60
61          string[] xval = { "3:10", "3:11", "3:12", "3:13", "3:14",
62              "3:15", "3:16", "3:17", "3:18", "3:19"};
63
64          var speedSeries2 = new Series("ML");
65          speedSeries2.ChartType = SeriesChartType.Line;
66          speedSeries2.Color = Color.Red;
67          chart1.Series.Add(speedSeries2);
68          chart1.Series["ML"].Points.DataBindXY(xval, yval);
69          chart1.Series["ML"].LegendText = "ML Prediction";
70          chart1.Series["ML"].IsValueShownAsLabel = true;
71      }
```

Add code to Form1_Load

```
72      private void Form1_Load(object sender, EventArgs e)
73      {
74          SetChartArea();
75          MLLine();
76          IoTLine();
77      }
```

If need 3d Add these code to method SetChartArea()

```
chart1.ChartAreas[0].Area3DStyle.Enable3D = true;
chart1.ChartAreas[0].Area3DStyle.IsRightAngleAxes = false;
chart1.ChartAreas[0].Area3DStyle.Inclination = 40;
chart1.ChartAreas[0].Area3DStyle.Rotation = 20;
```

What's next?