Lucrare8_____25/03/2024

Codul in C# in care folosesc clasa “osciloscop” :

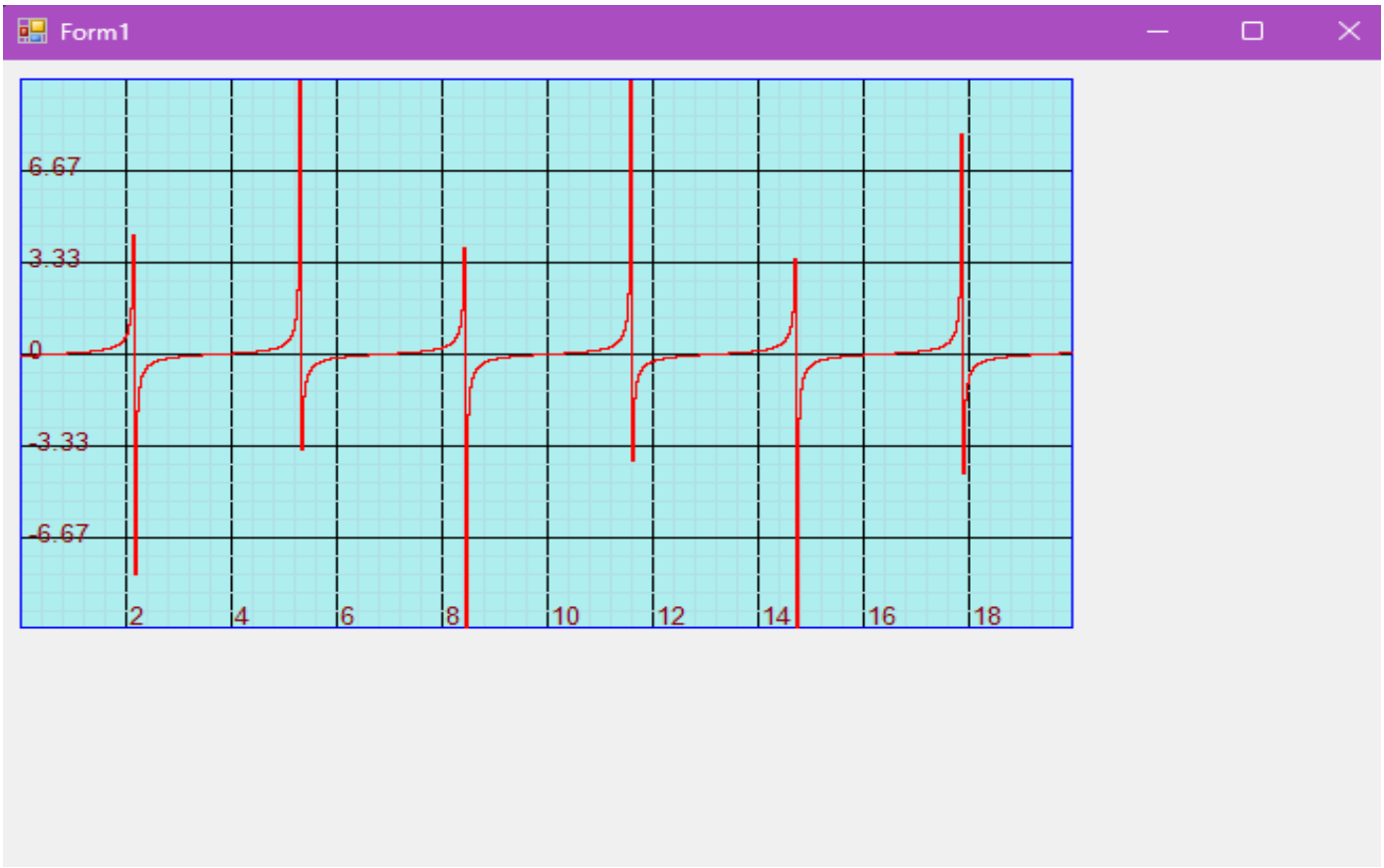
```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Security.Cryptography;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace Lucrare8
{
    3 references
    public partial class Form1 : Form
    {
        1 reference
        public Form1()
        {
            InitializeComponent();
        }
        System.Drawing.Graphics desen;
        System.Random n;
        osciloscop oscil;
        1 reference
        private void Form1_Paint(object sender, PaintEventArgs e)
        {
            desen = this.CreateGraphics();
            n = new System.Random();
            oscil = new osciloscop(desen, 10, 10, 500, 300, 10, -10, Color.PaleTurquoise, Color.Black, Color.PowderBlue);
            oscil.display();
            double[] valori1 = new double[500];
            double pas = 0.05;
            double x;
            for (int i = 0; i < 500; i++)
            {
                x = (double)i / 500 * 20 - 10;
                valori1[i] = Math.Tan(x) * 0.112;
            }
            oscil.sterg();
            oscil.auto_sx(pas * 400, 0);
            oscil.setval(valori1, 500, Color.Red);
            oscil.display();
        }
    }
    public class osciloscop
    {
        int x, y, w, h, val, val_v;
        double v_max, v_min, x_max, x_min;
        System.Drawing.Graphics zona_des;
        System.Drawing.Font font_ni = new System.Drawing.Font("Arial", 10);
        System.Drawing.SolidBrush pen = new System.Drawing.SolidBrush(System.Drawing.Color.DarkRed);
        System.Drawing.Bitmap img;
        System.Drawing.Bitmap ims;
        2 references
        public void sterg()
        {
            img = new Bitmap(ims);
        }
        2 references
        public void display()
        {
            zona_des.DrawImage(img, x, y);
        }
        0 references
        public void auto_sy(double val_max, double val_min)
        {
            if (val_max - val_min != 0)
            {
                v_max = val_max;
                v_min = val_min;
            }
        }
        1 reference
        public void auto_sx(double x_maxim, double x_minim)
        {
            if (x_max - x_min != 0)
            {
                x_max = x_maxim;
                x_min = x_minim;
            }
            else
            {
                x_max = w;
                x_min = 0;
            }
        }
```

```
81          public void setval(double[] vals, int nrv, System.Drawing.Color cul)
82          {
83              int i, j;
84              if (w > 0 && h > 0)
85              {
86                  double amplif;
87                  if ((v_max - v_min) != 0)
88                      amplif = (System.Convert.ToDouble(h) /
89                     System.Convert.ToDouble(v_max - v_min));
90                  else
91                      amplif = 1;
92                  double transl = v_min * amplif;
93                  val_v = System.Convert.ToInt16(h + transl - amplif *
94                 System.Convert.ToDouble(vals[0]));
95                  if (val_v >= h)
96                      val_v = h - 1;
97                  if (val_v <= 0)
98                      val_v = 1;
99                  for (i = 0; i < w; i++)
100                 {
101                     val = System.Convert.ToInt16(h + transl - amplif *
102                    System.Convert.ToDouble(vals[i]));
103                     if (val >= h)
104                         val = h - 1;
105                     if (val <= 0)
106                         val = 1;
107                     if (val_v < val)
108                     {
109                         for (j = val_v; j <= val; j++)
110                         {
111                             img.SetPixel(i, j, cul);
112                         }
113                     }
114                     else
115                     {
116                         for (j = val; j <= val_v; j++)
117                         {
118                             img.SetPixel(i, j, cul);
119                         }
120                     }
121                     val_v = val;
122                 }
```

```
123                 Graphics g = Graphics.FromImage(img);
124                 double vx = x_min;
125                 double pasx = System.Convert.ToDouble(x_max - x_min) /
126                System.Convert.ToDouble(w) * 50;
127                 for (i = 50; i < w; i += 50)
128                 {
129                     vx = vx + pasx;
130                     g.DrawString(Math.Round(vx, 2).ToString(), font_ni, pen, i,
131                     h - 15);
132                 }
133                 double vy = v_min;
134                 double pasy = System.Convert.ToDouble(v_max - v_min) /
135                System.Convert.ToDouble(h) * 50;
136                 for (i = 50; i < h; i += 50)
137                 {
138                     vy = vy + pasy;
139                     g.DrawString(Math.Round(vy, 2).ToString(), font_ni, pen, 2,
140                     h - i - 10);
141                 }
142             }
143         }
            1 reference
144         public osciloscop(Graphics desen, int pozx, int pozy, int n_maxx, int n_maxy, double val_max, double val_min, Color culoare_fundal, Color culoare_grid_m, Color culoare_grid)
145         {
146             x = pozx;
147             y = pozy;
148             w = n_maxx;
149             h = n_maxy;
150             v_max = val_max;
151             v_min = val_min;
152             x_max = n_maxx;
153             x_min = 0;
154             zona_des = desen;
155             if (w > 0 && h > 0)
156             {
157                 img = new Bitmap(w, h, zona_des);
158                 ims = new Bitmap(w, h, zona_des);
159                 int i, j;
160                 for (j = 0; j < h; j++)
161                 {
162                     for (i = 0; i < w; i++)
163                     {
164                         ims.SetPixel(i, j, culoare_fundal);
165                     }
```

```
                    }
                    for (j = 0; j < h; j++)
                    {
                        if (j % 10 == 0)
                        {
                            for (i = 0; i < w; i++)
                            {
                                if (j % 50 == 0)
                                    ims.SetPixel(i, j, culoare_grid_m);
                                else
                                    ims.SetPixel(i, j, culoare_grid);
                            }
                        }
                        else
                        {
                            for (i = 0; i < w; i++)
                            {
                                if (i % 10 == 0)
                                {
                                    if (i % 50 == 0)
                                        ims.SetPixel(i, j, culoare_grid_m);
                                    else
                                        ims.SetPixel(i, j, culoare_grid);
                                }
                            }
                        }
                    }
                    for (i = 0; i < w; i++)
                    {
                        ims.SetPixel(i, 0, System.Drawing.Color.Blue);
                        ims.SetPixel(i, h - 1, System.Drawing.Color.Blue);
                    }
                    for (j = 0; j < h; j++)
                    {
                        ims.SetPixel(0, j, System.Drawing.Color.Blue);
                        ims.SetPixel(w - 1, j, System.Drawing.Color.Blue);
                    }
                    sterg();
                }
            }
        }
    }
```

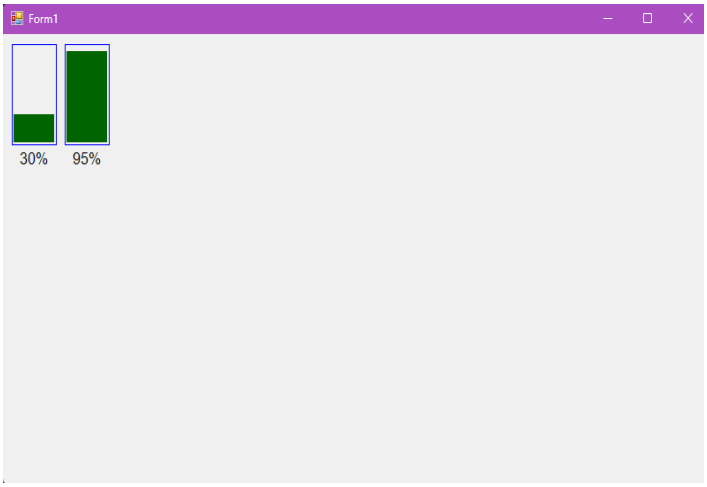
Caseta de afisare:

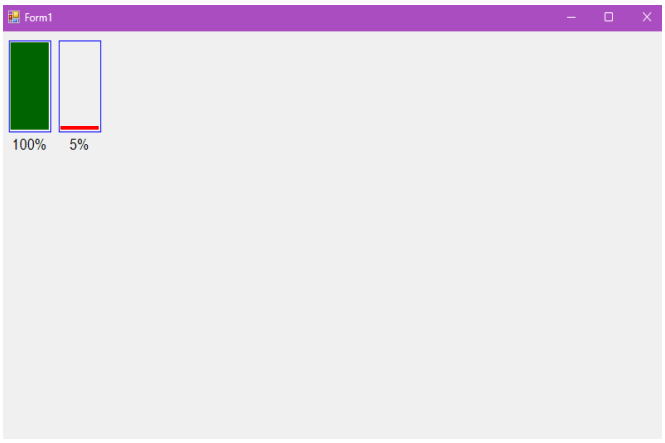


Codul C# cu clasa noua care sa defineste un instrument virtual:

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace L8
{
    3 references
    public partial class Form1 : Form
    {
        1 reference
        public Form1()
        {
            InitializeComponent();
        }
        System.Drawing.Graphics desen;
        System.Random n;
        baterie bat1, bat2;
        int p1 = 25, p2 = 100;
        1 reference
        private void Form1_Paint(object sender, PaintEventArgs e)
        {
            desen = this.CreateGraphics();
            n = new System.Random();
            bat1 = new baterie(this, desen, 10, 10, 50, 100);
            bat2 = new baterie(this, desen, 70, 10, 50, 100);
            bat1.desenez(Color.Blue);
            bat2.desenez(Color.Blue);
            bat1.setval(p1, Color.DarkGreen);
            bat2.setval(p2, Color.DarkGreen);
        }
        1 reference
        private void timer1_Tick(object sender, EventArgs e)
        {
            if (p1 <= 100)
            {
                p1 += 1;
                if (p1 > 100)
                {
                    p1 = 100;
                }
                bat1.setval(p1, Color.DarkGreen);
            }
            if (p2 <= 100)
            {
                p2 -= 1;
                if (p2 < 0)
                {
                    p2 = 0;
                }
                bat2.setval(p2, Color.DarkGreen);
                if (p2 < 20)
                {
                    bat2.setval(p2, Color.Red);
                }
            }
        }
```

```
61      public class baterie
62      {
63          Form form;
64          System.Drawing.Graphics zona_des;
65          int x, y, w, h;
            2 references
66          public void desenez(System.Drawing.Color culoare_contur)
67          {
68              System.Drawing.Pen creion_a = new System.Drawing.Pen(culoare_contur);
69              zona_des.DrawRectangle(creion_a, x, y, w, h);
70          }
            5 references
71          public void setval(double procent, System.Drawing.Color culoare_procent)
72          {
73              System.Drawing.SolidBrush pens_p = new System.Drawing.SolidBrush(culoare_procent);
74              int h1 = (int)((h - 4) * (procent / 100.0));
75              int h2 = h - 4 - h1;
76              zona_des.FillRectangle(new SolidBrush(form.BackColor), x+ 2, y + 2, w- 4, h2);
77              zona_des.FillRectangle(new SolidBrush(culoare_procent), x + 2, y + 2 +(h - 4 - h1), w - 4, h1);
78              zona_des.FillRectangle(new SolidBrush(form.BackColor), x + 2, y + h + 5, w - 4, 20);
79              string procentString = procent.ToString() + "%";
80              Font font = new Font("Arial", 12);
81              SizeF size = zona_des.MeasureString(procentString, font);
82              int stringX = x + (w - (int)size.Width) / 2;
83              int stringY = y + h + 5;
84              zona_des.DrawString(procentString, font, Brushes.Black, stringX,stringY);
85          }
            2 references
86          public baterie(Form form, System.Drawing.Graphics desen, int pozx, int pozy,int lat, int inalt)
87          {
88              this.form = form;
89              zona_des = desen;
90              x = pozx;
91              y = pozy;
92              w = lat;
93              h = inalt;
94          }
95      }
96  }
```





Am avut laptopul in service in ultimele 2 saptamani, din aceasta cauza nu am reusit sa incarc la timp lucrarea8 si lucrarea finala.