# GDI+

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About GDI+ Managed Code

- GDI+ is the portion of the Windows operating system

- Provides two-dimensional vector graphics, imaging, and typography.

- GDI+ improves on GDI (the Graphics Device Interface included with earlier versions of Windows) by adding new features and by optimizing existing features.

- The GDI+ managed class interface (a set of wrappers) is part of the .NET Framework, an environment for building, deploying, and running XML Web services and other applications.

Example 00100: Vector graphics

Rectangle

Filled Rectangle

Ellipse

Filled Ellipse

Line

Thick Line

Dotted Line

Arc

String
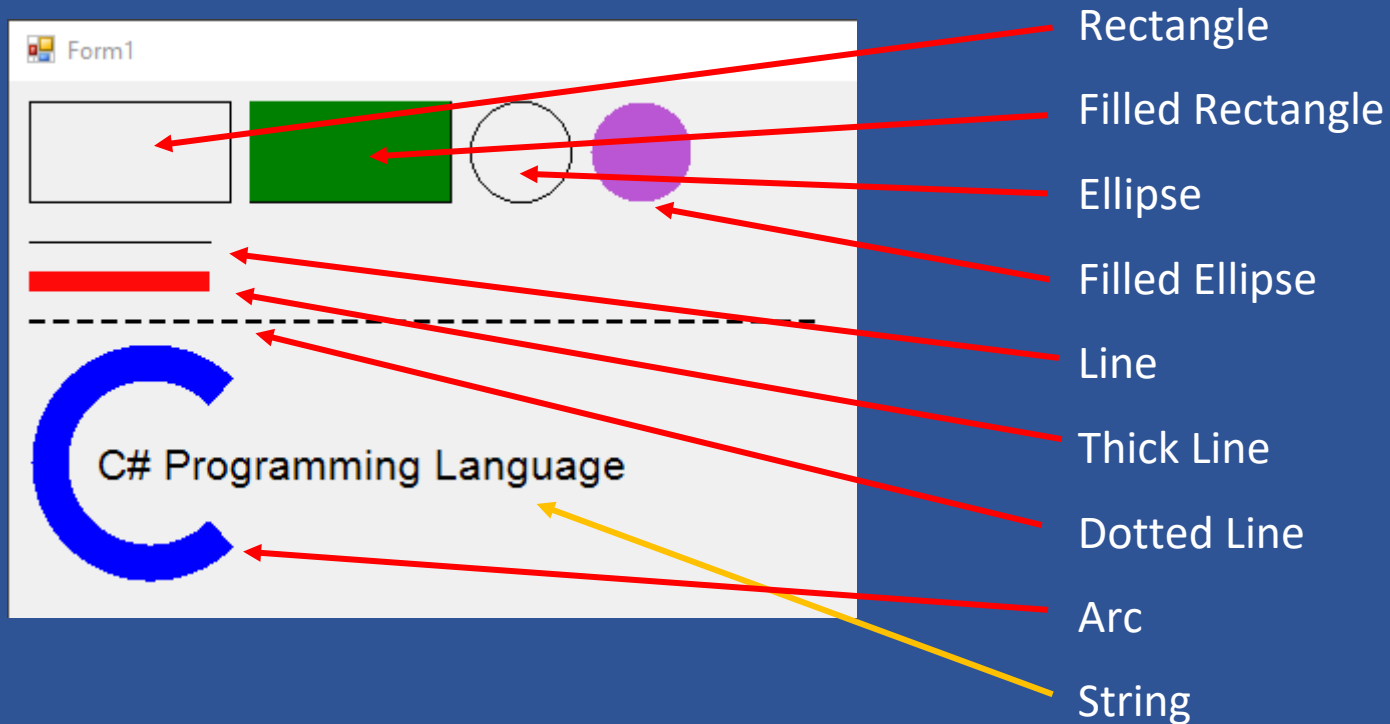
- Put Code in Form paint Event
- Use e.Graphics.Draw . . .

```csharp
private void Form1_Paint(object sender, PaintEventArgs e)
{
    DrawGraphics(e);
}
private void DrawGraphics(PaintEventArgs e)
{
    // draw rectangle -------------------------------------
    var myRec = new Rectangle(10, 10, 100, 50); // x,y,width,height
    e.Graphics.DrawRectangle(Pens.Black, myRec);

    // draw filled rectangle -------------------------------------
    var myFillRec = new Rectangle(120, 10, 100, 50); // x,y,width,height
    e.Graphics.DrawRectangle(Pens.Black, myFillRec);
    e.Graphics.FillRectangle(Brushes.Green, myFillRec);
```

Example 00110: GDI+ in User Control

Create User Control with 10 horizontal bar LED

User Control

Track Bar
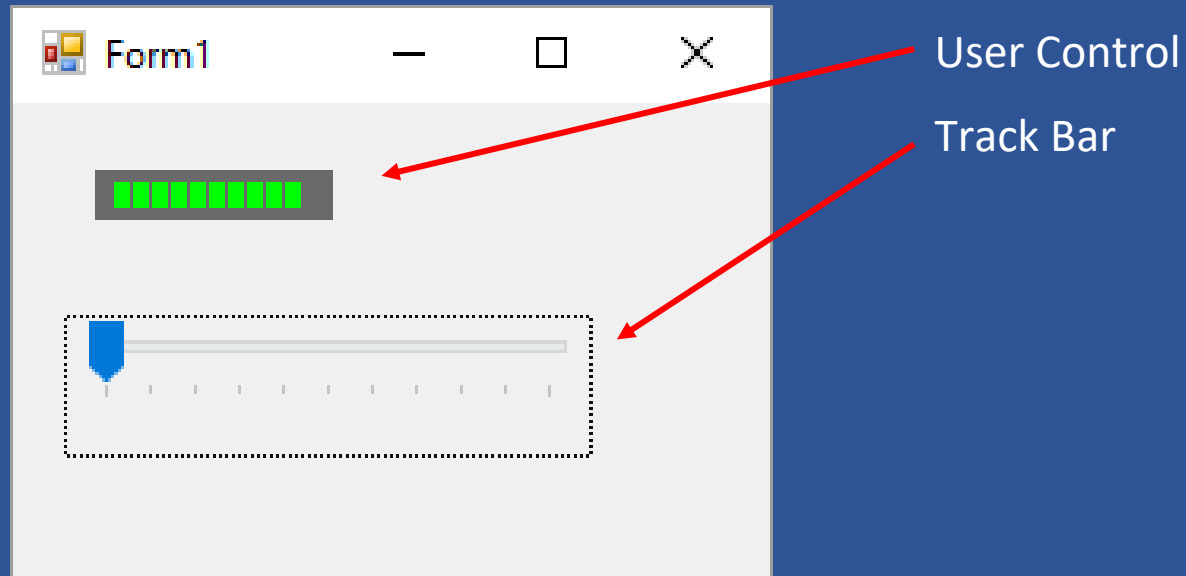
Example 00120: Diag User Control

```
private void DrawBarGraph(PaintEventArgs e)
{
    const float barHight = 12;
    float x1 = 4, y1 = 4, x2 = 4, y2 = barHight;
    float gap = 2;
    Pen myPen;

    int j = 0;
    for (float i = 2; i < 30; i+=3)
    {
        if(j < barValue)
            myPen = new Pen(Color.Yellow, 5);  // yellow
        else
            myPen = new Pen(Color.Lime, 5);  // grenn
        e.Graphics.DrawLine(myPen, x1 + (gap * i), y1, x2 + (gap * i), y2);
        j++;

    }
}
```

Diag.cs [Design]   X   Diag.cs
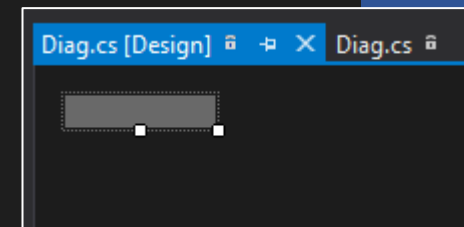
Diag indicator on the left of DataGridView

Show voltage in graphic

Randomize this column

Example 00130: Class and object GDI+

without using User control

Block object GDI+
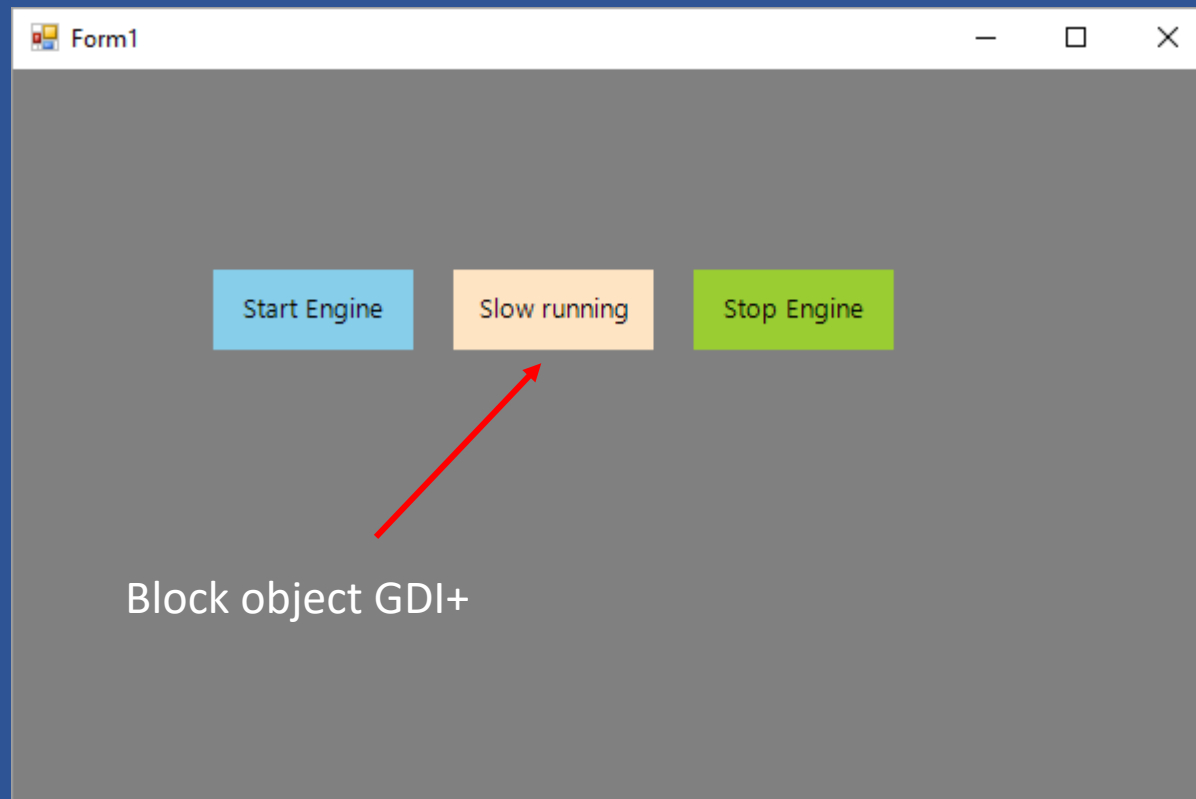
Example 00140: Create roundedRectangle

from Block using OOP inheritance

RoundedRectangle
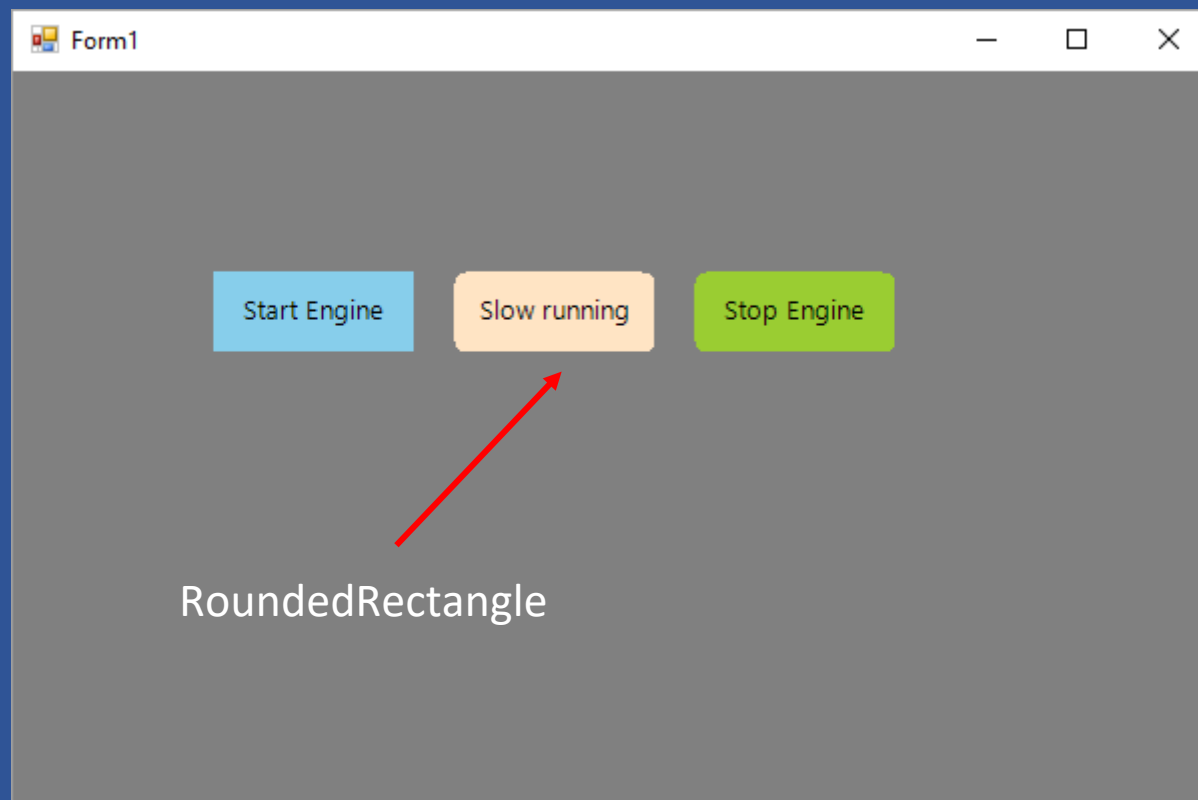
Example 00150: Create Circle object

with caption text

Circle GDI+ object
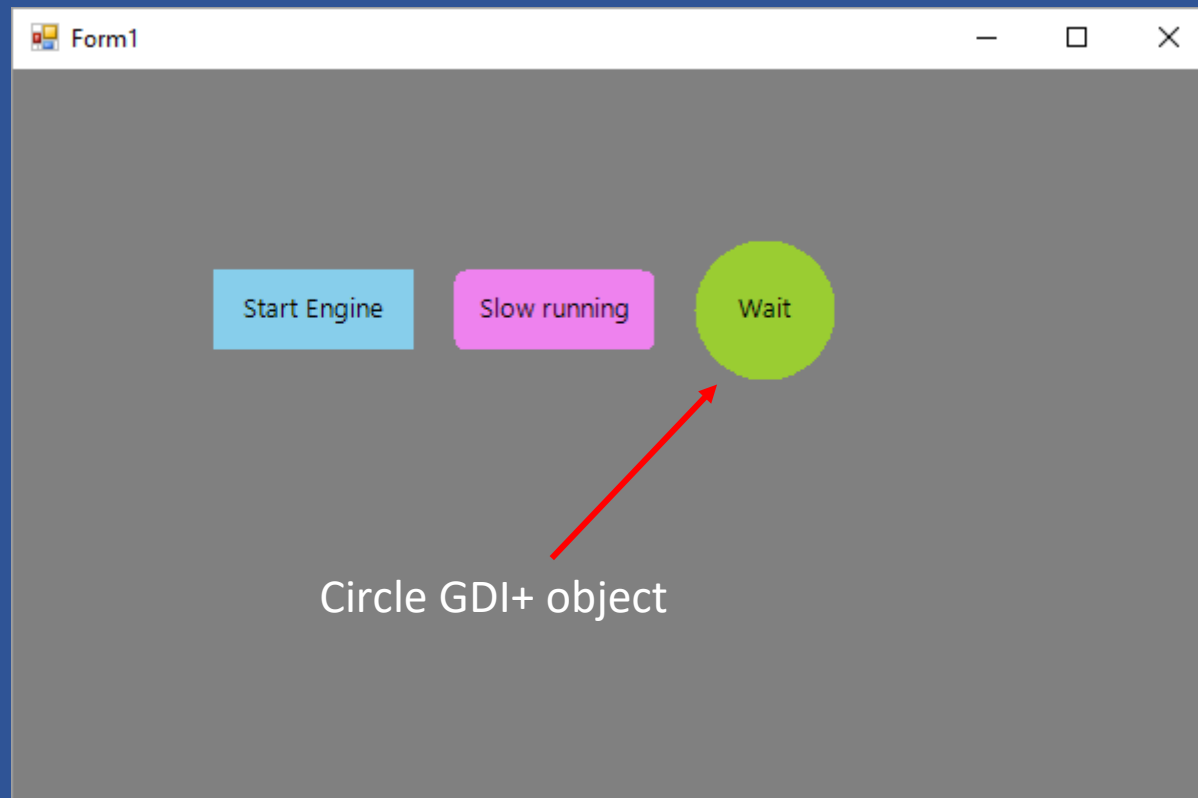
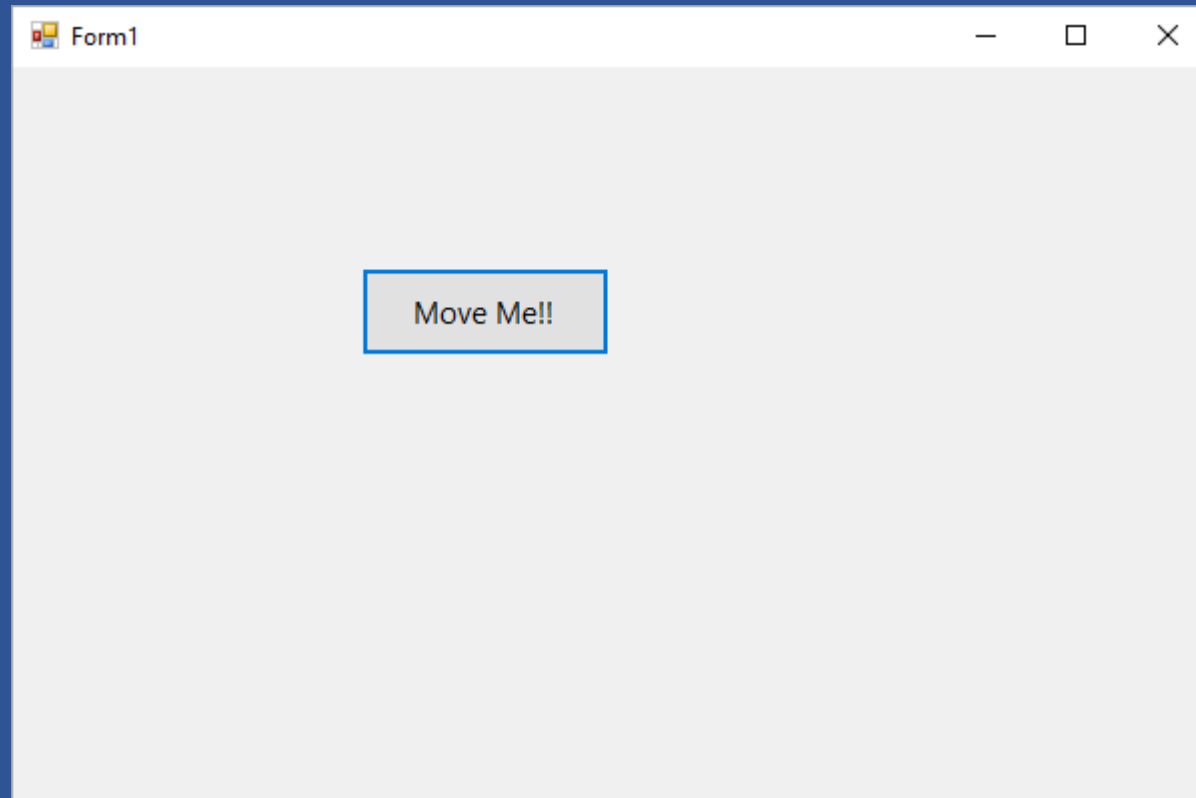# Example 00160: How to draw GDI+ Arrow
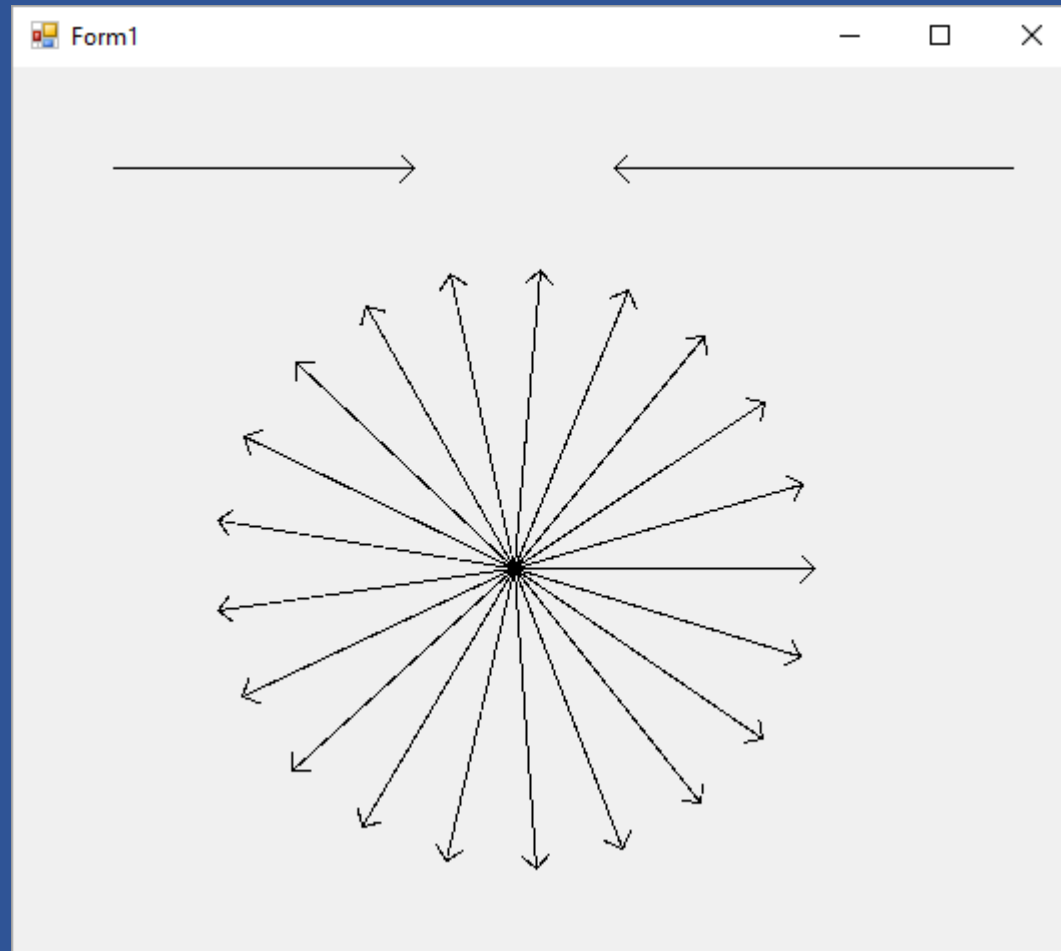
Example 00170: Encapsulate Arrow to a class
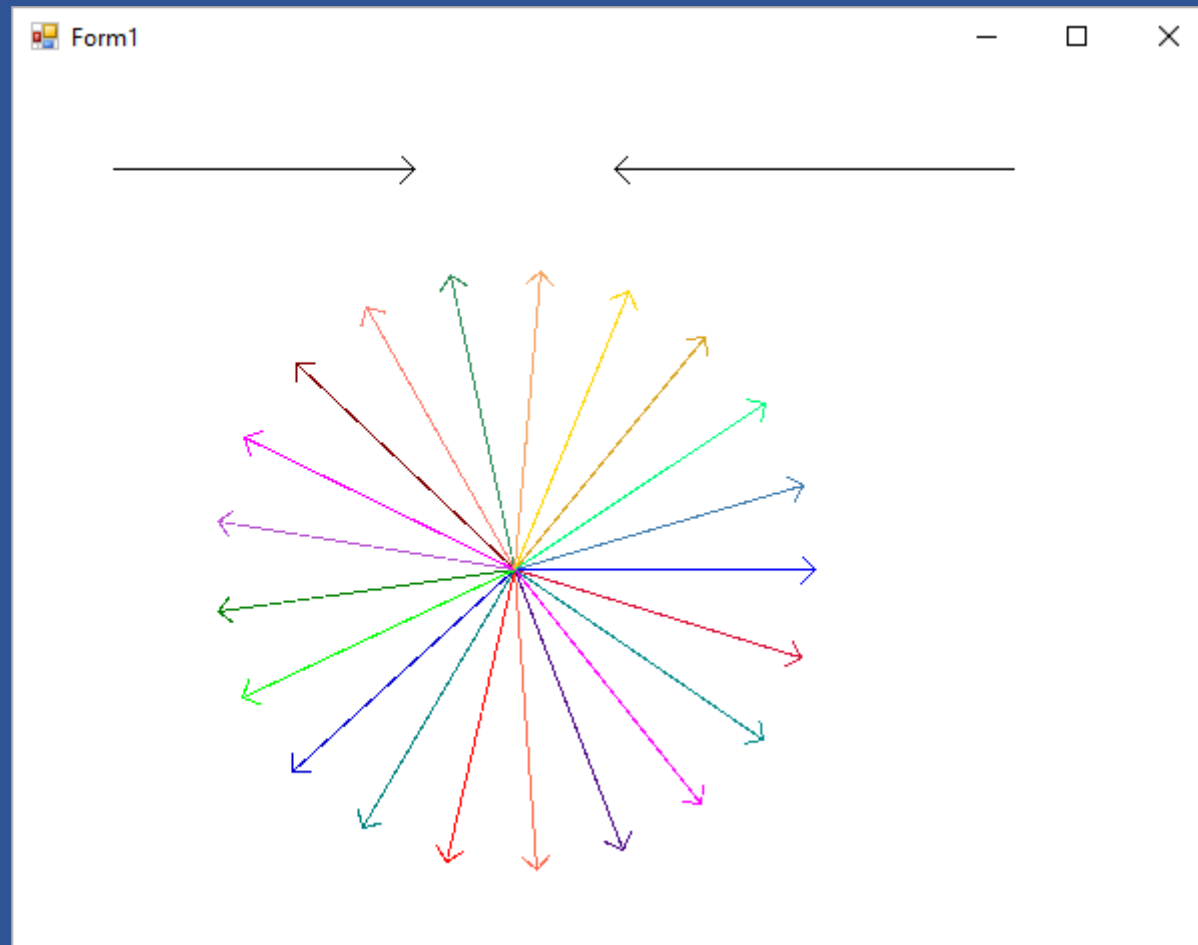
Example 00180: Add text to arrow
rotate correctly according to line angle
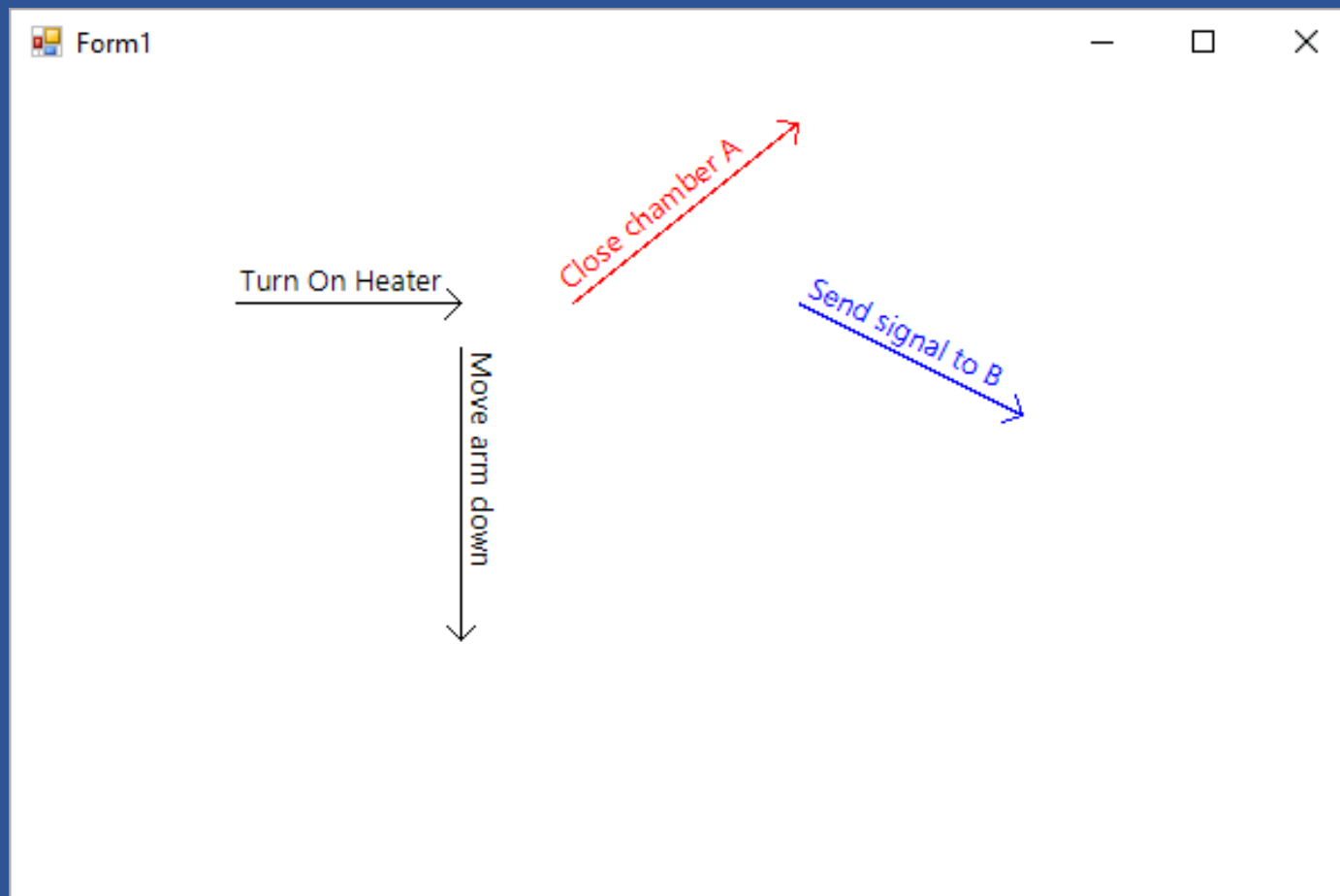
Example 00190: Draw a simple diagram
and animate GDI+ object
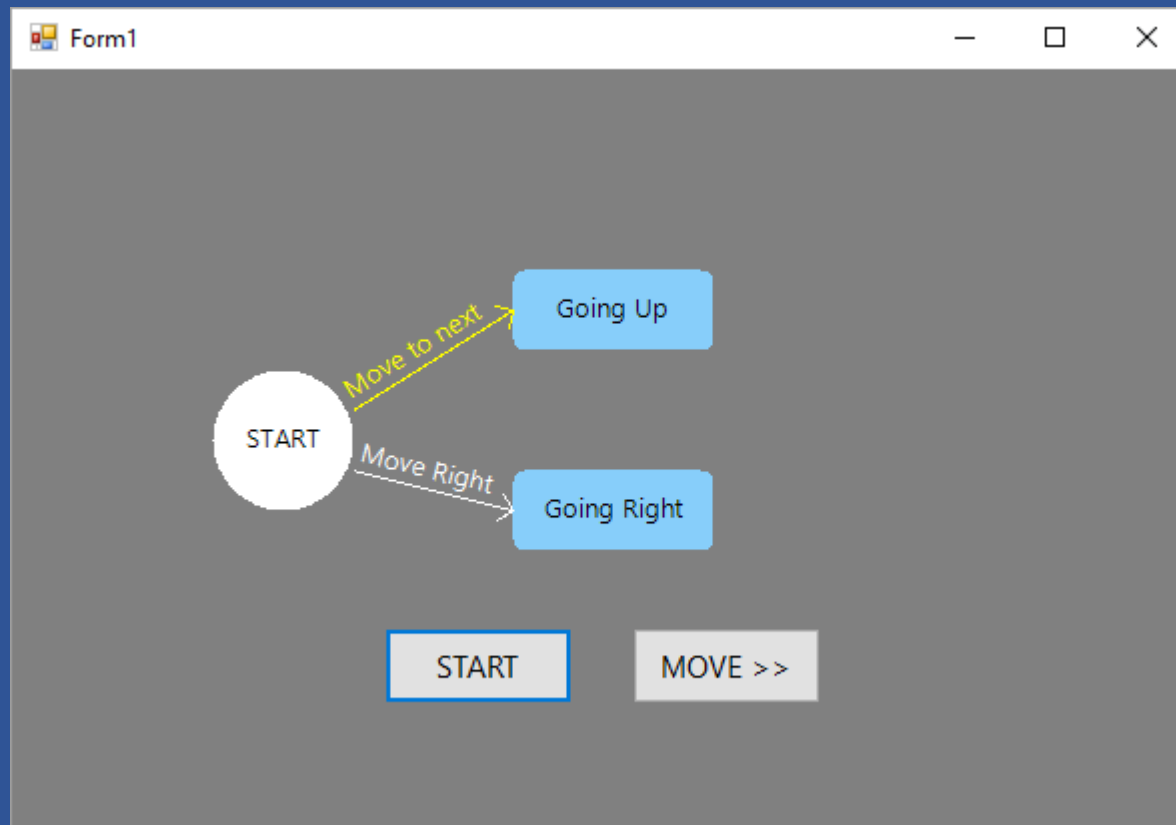
Example 00200: Drag and move control

Example 00202: Drag and move PictureBox
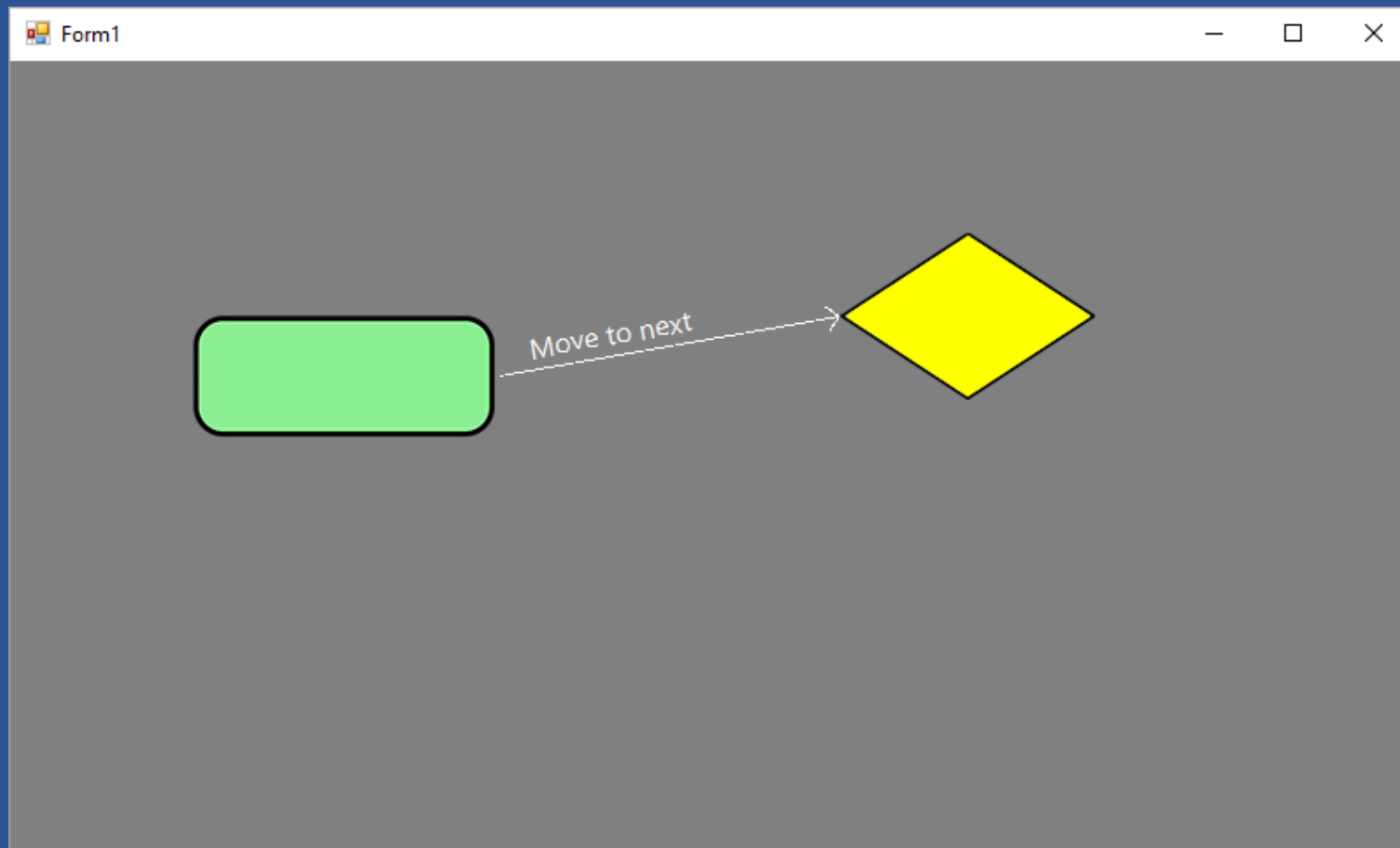## with transparent background
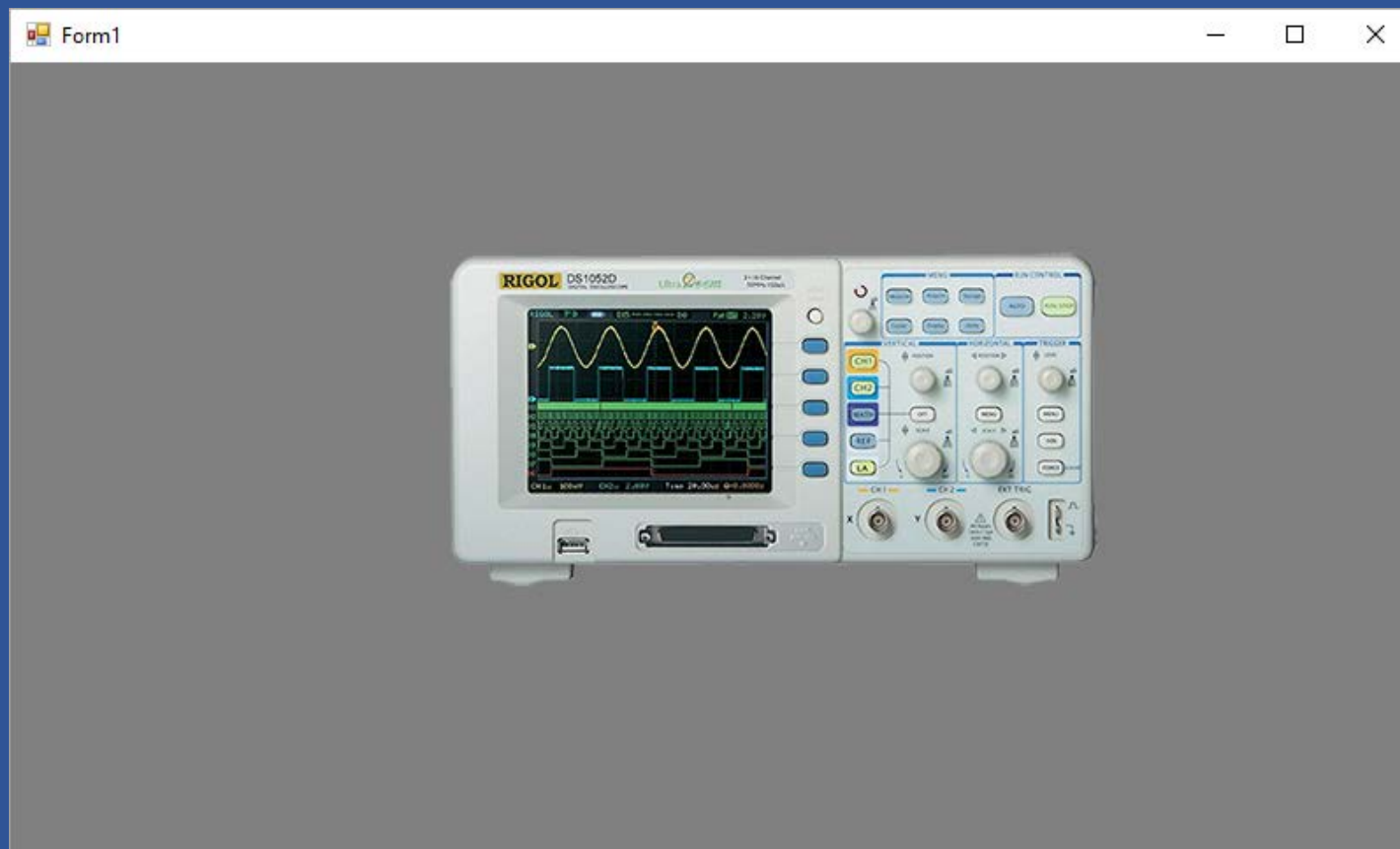
Example 00210: Draw text inside pictureBox
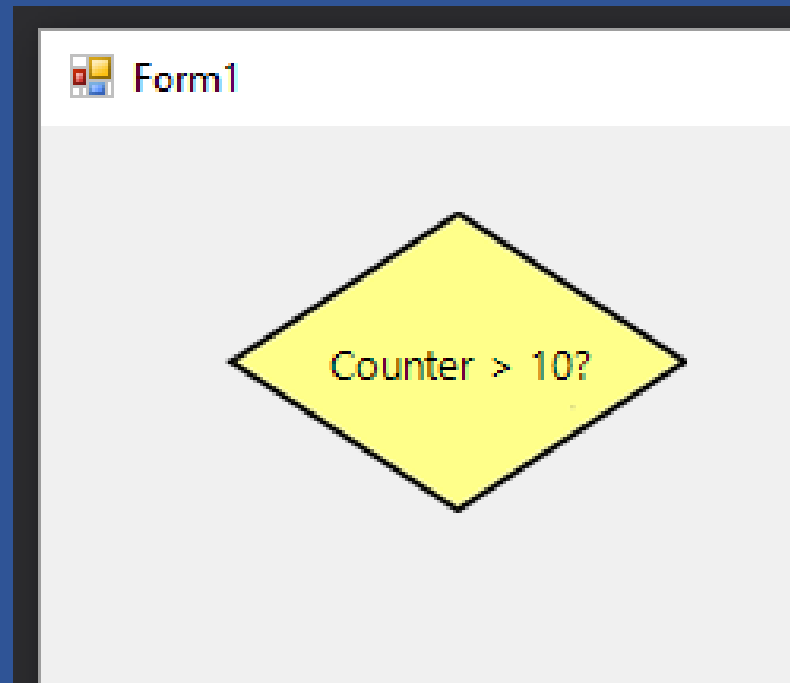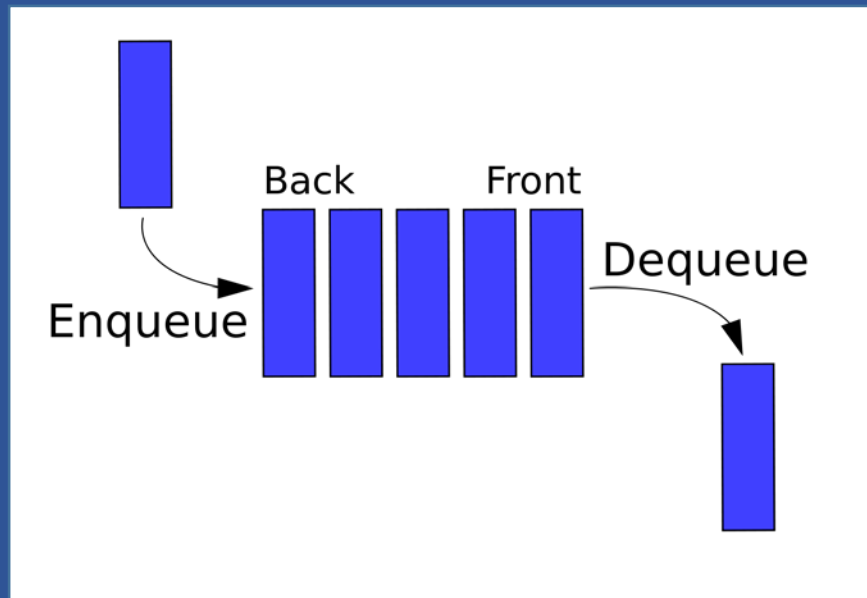
Example 00220: Add new 2 kind of control to form
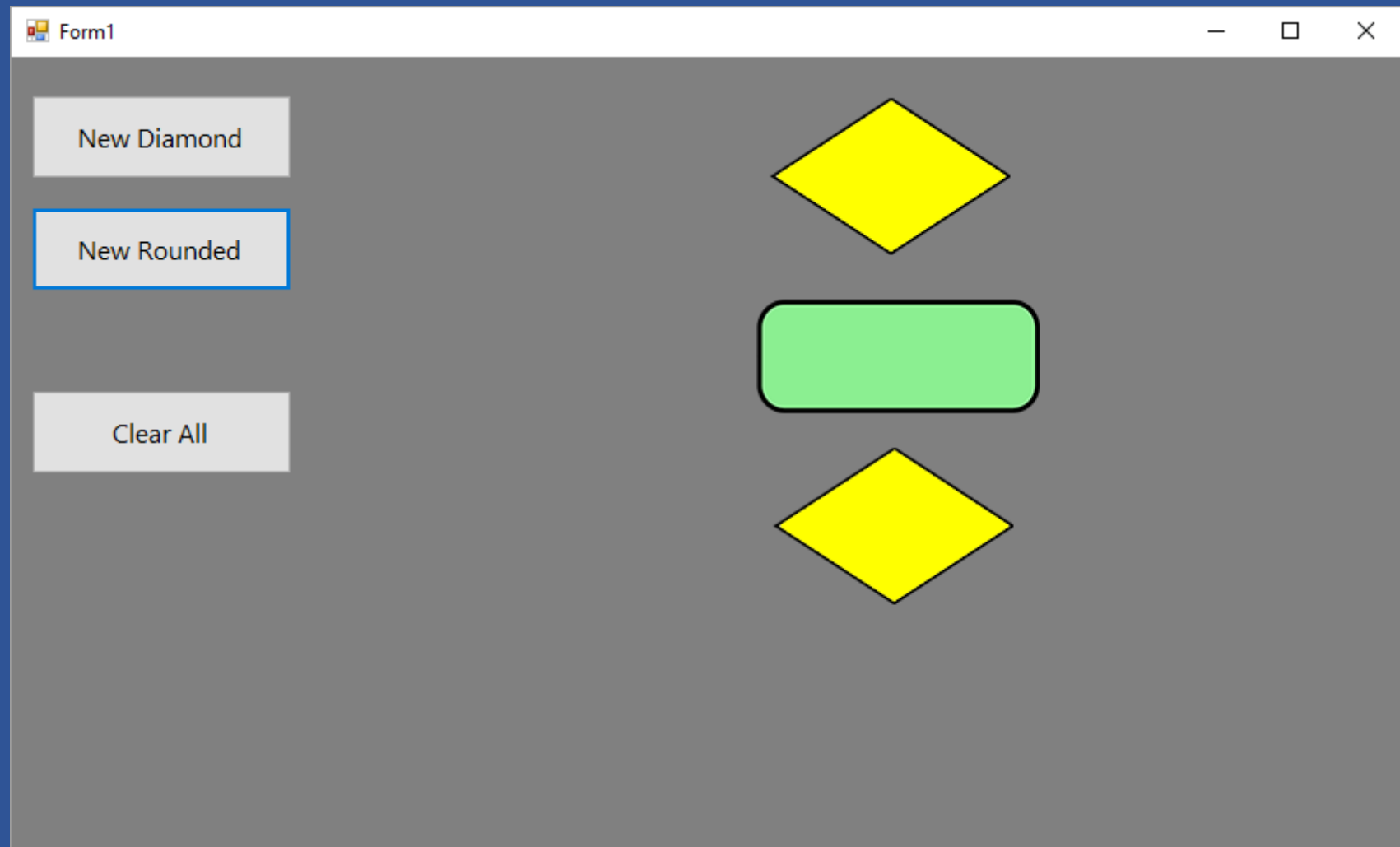
Example 00230:
Move Arrow Text Line when Drag Control
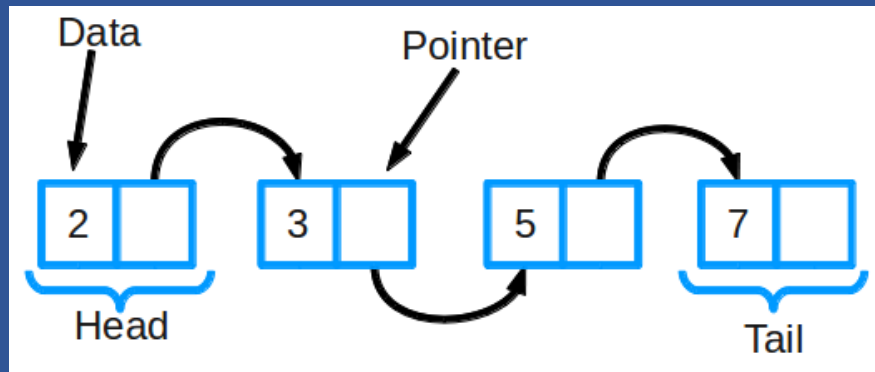
Example 00240: Queue<T> operation demo GDI+

First in First Out (FIFO)

Example 00250: Demo List<T> operation demo GDI+

Smart Array

Example 00260: Stack<T> operation demo GDI+

Last In First Out (LIFO)
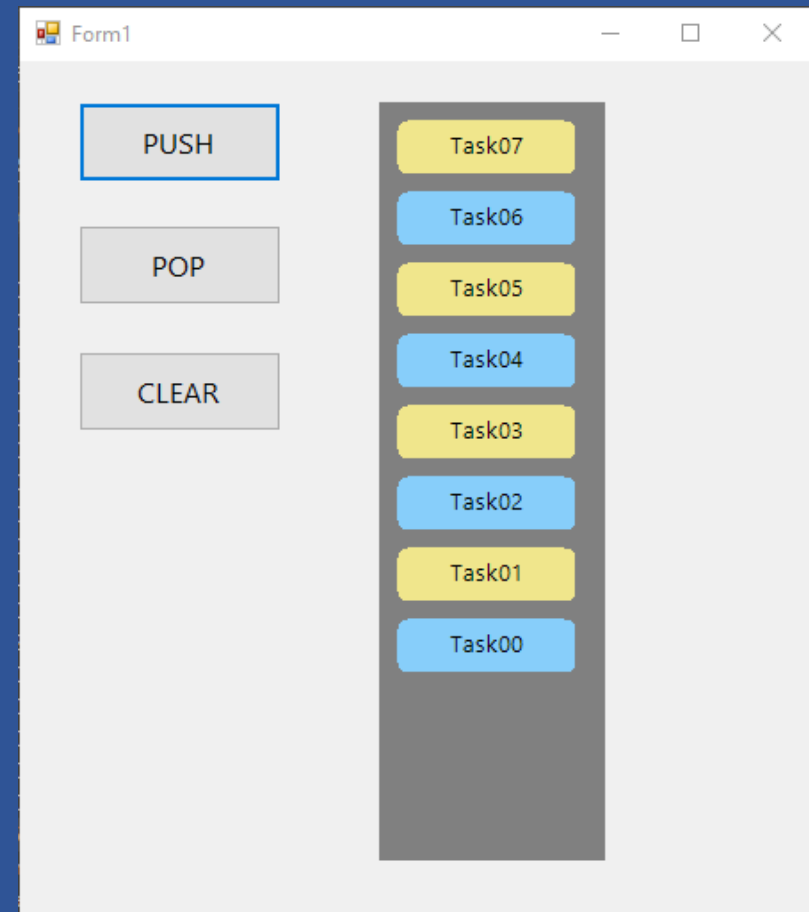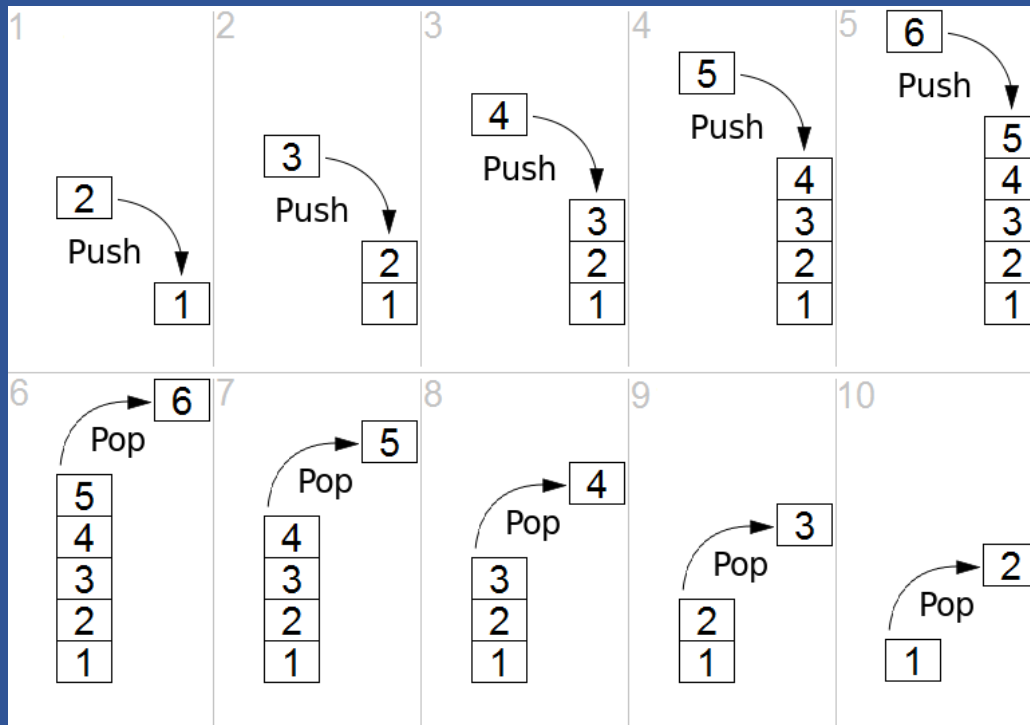
Example 00270: Dictionary<T> operation demo GDI+

key pair value