

## Homework #9

LabVIEW

Dr. Pogo

Assignment is due on Thursday, November 30, 2023

Assigned November 16, 2023

### Assignment #9: Acquiring Mouse data (Homework-only track)

**Controls:** Ring control for drawing mode (Rectangle, Circle, Line, Multiple-segment line)  
Buttons for Clear and Quit.  
A colorbox control.

**Indicators:** An xy plot with multiple plots.

**Dialogs:** Clear

**Hardware:** Just a mouse!

You are to create a simple drawing program. The xy plot has horizontal and vertical ranges of 0 to 10. You may use my mouse subvi. Before connecting the subvi, your xyGraph should *already* be connected to display an **array** of clusters, even if that array (or the clusters themselves!) is blank, otherwise there'll be a data-type mismatch. So, use a local variable to put blank *array* data into the graph as part of the initialization process.

The user selects one of the drawing tools with the ring, and uses the mouse to add objects ("series") to the plot. All drawing is based on pairs of single-clicks. Because of some of the requirements below, your plot should always contain at least one series *more* than the user can actually see. So, when you first run the program, there should already be one series in the plot. In my version, the plot initializes with a red line segment going from (0, 0) to (0, 0), so it looks like nothing is there. This is the "working" series. Then, when the user completes their first series, that initial series is overwritten with the new one, and then a second "blank" series is created as the next "working" series.

The actual behavior depends on the mode:

- In *Rectangle* mode, the first of a pair of clicks begins a new rectangle at the position of the mouse at the time of the click. The next click finalizes the rectangle. Between clicks, the "potential" rectangle is continually drawn and redrawn as the user moves the mouse.
- The *Circle* mode is similar to the rectangle control. The first click is at the center of the circle, and the second click is at a point on the circumference.
- The *Line Segment* mode is similar to the rectangle control. The two clicks specify the endpoints of a straight line.
- The *Multiple Line Segments* mode is similar to Line Segment mode, but *is much more involved* because the input system uses more than just two single-clicks. When in this mode, the second click saves the mouse location in an array shift register, and also treats this second click as the first click for the next line segment. The entire multi-line series is concluded when the user adds two consecutive points that are within a radius of about 0.2 of each other.

The *Colorbox* control sets the color of the "working" series. So, if a first click has not happened yet, it changes the color of the "blank" plot that's already there. If the first click has already happened, it changes the color of the active plot "live" as it is being drawn. Since the graph contains many series, you have to *first* use a property node to pick which series is the "active plot", and then *second* use a property node to set its color! They can't be done simultaneously.

The *Clear* control opens a simple dialog asking whether the user wants to clear all the series on the plot, or only the most recent. The dialog should also have a "cancel" option. Obviously, the appropriate series are then deleted. The user may not choose "Clear" while any drawing mode is in-process. In either case, be sure to then re-add a blank "working" series!

Your front panel might look like this:

