Course Title: Learning LabVIEW

Description: If you're charged with collecting and processing data from a variety of devices and systems—and, in turn, need to build software that interfaces with test and measurement equipment—traditional, text-based programming approaches may not be ideal. LabVIEW—a popular systems engineering platform—offers a unique approach. Using block diagrams, you can create virtual instruments that contain the logic you'll need to work with for your real devices, as well as build control panels that will help you monitor and manage them. In this course, instructor Barron Stone helps you get up and running with LabVIEW, showing how to write programs using its graphical programming approach. Along the way, he provides challenges and solutions that help you test your skills.

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Chapter: 2. General Concepts

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Video: SubVIs

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Note Time: Note Text:

0:01:35 use connector pane in upper right of front panel to give a subvi a way to receive and issue data. L. click on second box from top on left, then on a control -> do the same with the second box from the top on the right with an indicator.

0:02:53 can create custom icon by 2x click on icon in upper right hand side by the connector pane.

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Chapter: 3. Data Structures

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Video: Arrays

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Note Time: Note Text:

0:03:27 drag the indicator or control type for an array in the blank array shell

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Video: Clusters

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Note Time: Note Text:

0:00:13 2d arrays in labview can be used 1) to represent an image (think Cartesian) and 2) when multiple signals are being sampled and digitized (1d of array will index the signal or channel, the other dim. will contain the samples for that signal

0:03:35 clusters are like arrays but can have different types. wires leading from cluster are bundled (can be unbundled with function)

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Chapter: 4. Loops

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Video: While loops

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Note Time: Note Text:

0:02:10 stop button stops if true

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Video: For loops

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Note Time: Note Text:

0:03:05 rule of thumb for using for loops: when you know how many times a loop will need to execute before starting it

rule of thumb for using while loops: when you plan on stopping it yourself w/ a button or when a condition is met

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Video: Build an array with a for loop

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Note Time: Note Text:

0:01:52 auto-indexing terminal appears on outside of loops and has a blank box

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Video: Process an array with a for loop

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Note Time: Note Text:

0:02:18 no need to specify the number of iterations on a for loop if you feed it an input array through an auto-indexing terminal

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Video: Loop timing

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Note Time: Note Text:

0:02:00 add timing to loops to make sure LabView doesn't take up an entire processor on your machine

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Video: Local variables

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Note Time: Note Text:

0:02:00 clean up broken wires: ctrl + B

0:02:11 to get two loops to run together if one of them feeds data to the other, you have to break the data dependency between them and use a local variable

0:05:05 mechanical action of bools: switch (on/off), latch (active/not active)

0:05:17 global variable pass data between separate VIs on the same computer as local variables do within the same VI between loops that need to run in parallel

0:05:23 LabView also had network-published variables that pass data between separate VIs on different computers on the same network.

0:06:12 use local variable ONLY when you want to break the data flow on purpose

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Video: Shift registers

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Note Time: Note Text:

0:01:54 R. click on border of loop to create shift register- what goes in on the right is available from the left on the next iteration. default on left of 0 but you can feed values into it

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Video: Stacked shift registers

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Note Time: Note Text:

0:00:43 use stacked shift registers to access shift registers from loops before the previous loop

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Chapter: 6. Debugging and Error Handling

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Video: View the error list

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Note Time: Note Text:

0:02:48 ctrl+h: context help menu

0:02:53 ctrl+t: view in splitscreen

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Video: Execution stepping

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Note Time: Note Text:

0:00:53 program will run to breakpoint then pause until instructed. access breakpoint tool: shift+click -> red breakpoint tool

0:01:03 can access subvi front panel via r. click

0:02:14 step in (open node, then pause), step over (finish node, then pause at next node), step out (finish node, then pause)

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Video: Error clusters

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Note Time: Note Text:

0:03:38 can create indicators for the three parts of an error in/out wire type after splitting the wire: function pallette -> cluster menu -> unbundle by name, then r. click to create indicators for each.

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Video: Challenge: Handle errors

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Note Time: Note Text:

0:00:01 connect error out/error in to handle errors that cause more errors further on in the program. Use simple error handler to choose how to handle error.

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Video: Solution: Handle errors

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Note Time: Note Text:

0:02:32 instead of unbundling the error wire and connecting the status wire to the stop condition for the while loop, labview lets you directly connect the error to the stop condition so that if an error occurs the loop will stop.

0:03:11 use shift registers to make sure error data doesn't get lost between while loop iterations.

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Chapter: 7. Signal Processing

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Video: Waveform charts

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Note Time: Note Text:

0:01:32 use waveform charts and loops to continuously update and display data as it is acquired or generated

0:02:27 clear the buffer of chart: r. click -> data options -> clear chart

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Video: Simulate Signal Express VI

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Note Time: Note Text:

0:03:12 dynamic data works with express VIs but not normal ones. can convert to/from dynamic using an expressVI

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Video: DAQ Assistant Express VI

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Note Time: Note Text:

0:00:34 DAQ assistant express vi is part of NI-DAQmx hardware driver

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Chapter: 8. LabVIEW Resources

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Video: Community forums and examples

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Note Time: Note Text:

0:01:18 documentation/example finder -> NI support and community. Must register to post/reply but not to browse