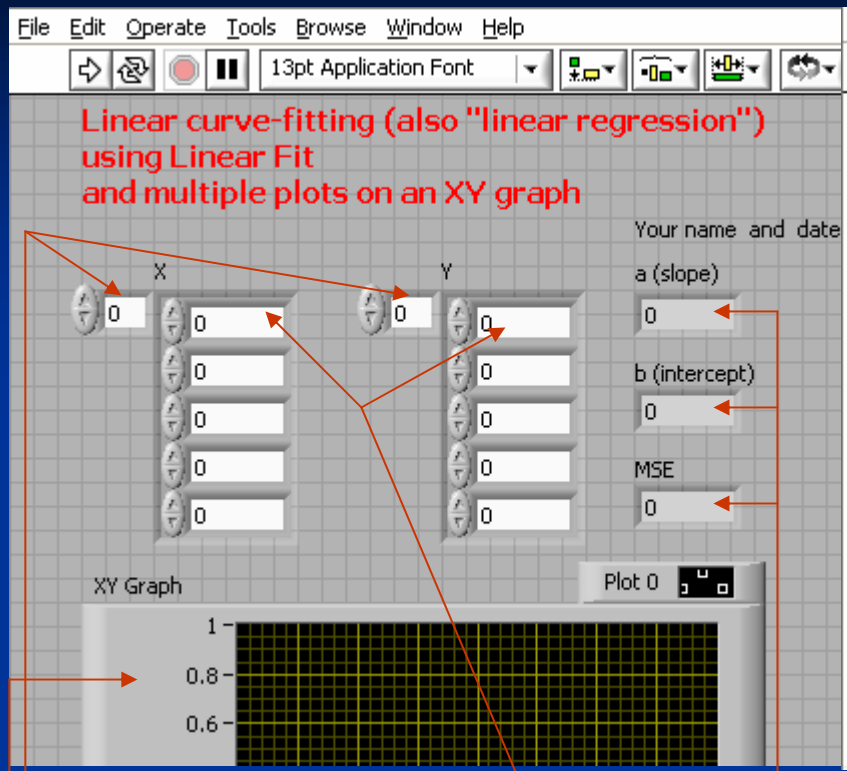
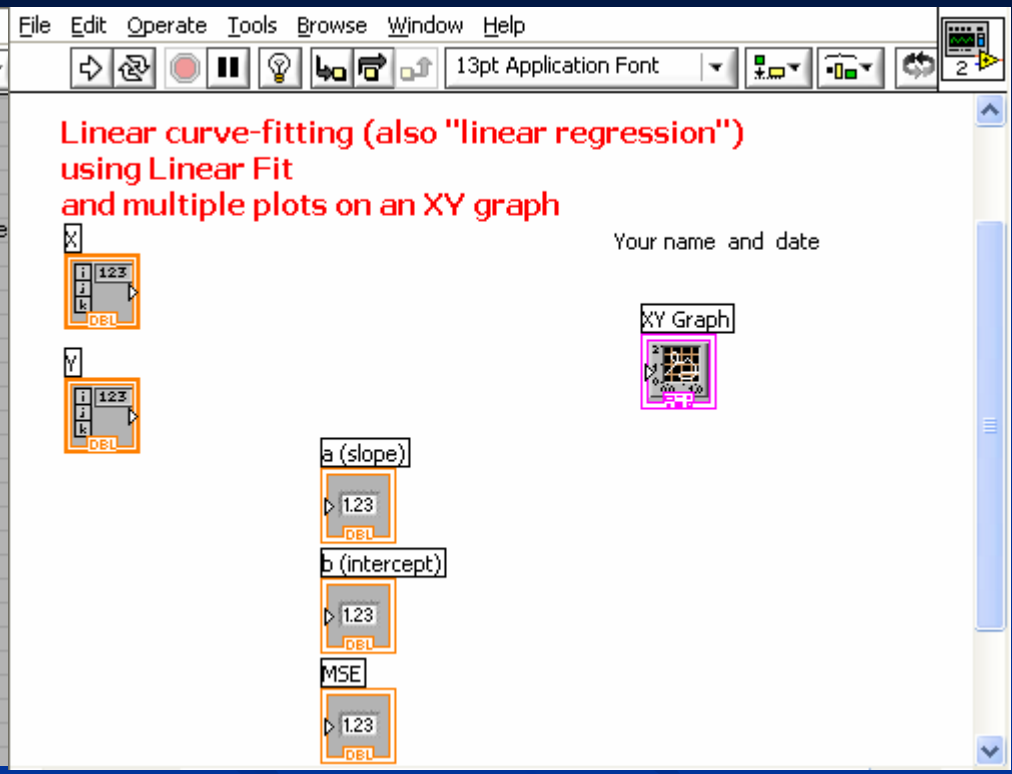


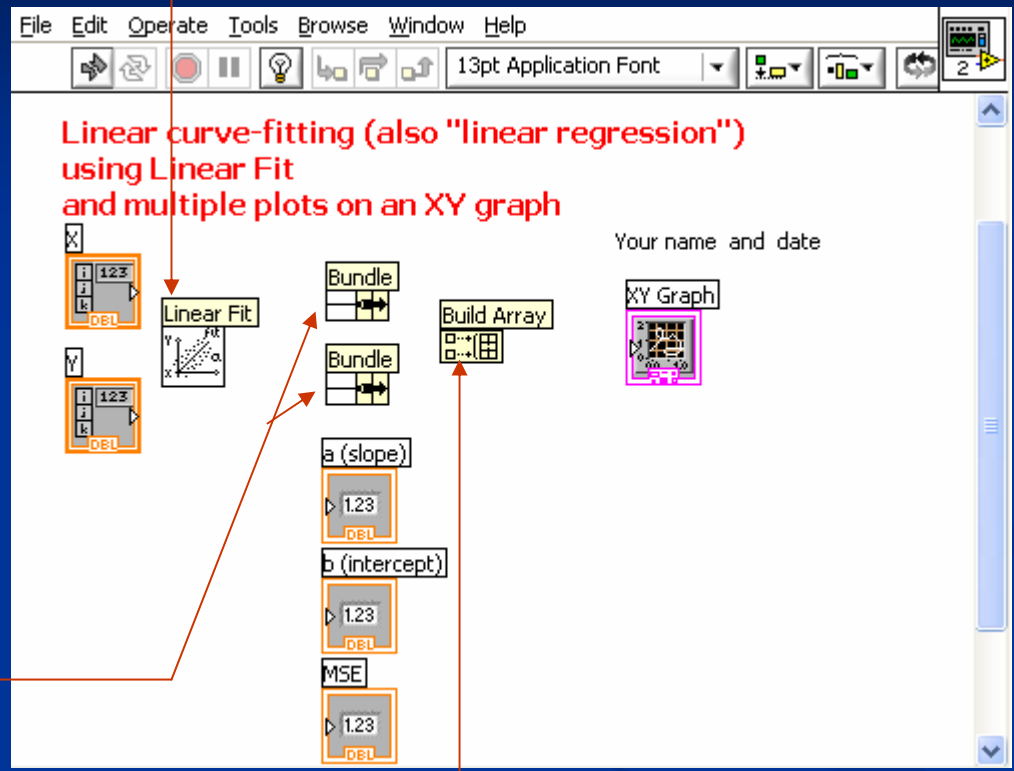


Arrays (All Ctrls) and Numeric Ctrls:
Use resize to show 5 boxes for 5 pairs of data;
Numeric Indicators for a, b, MSE;
XY Graph (All Ctrls/Graph;
not XY Graph Express): takes as inputs
Pairs of series: (X_1,Y_1), (X_2,Y_2), etc.

How to insert a numeric array, what is it for?

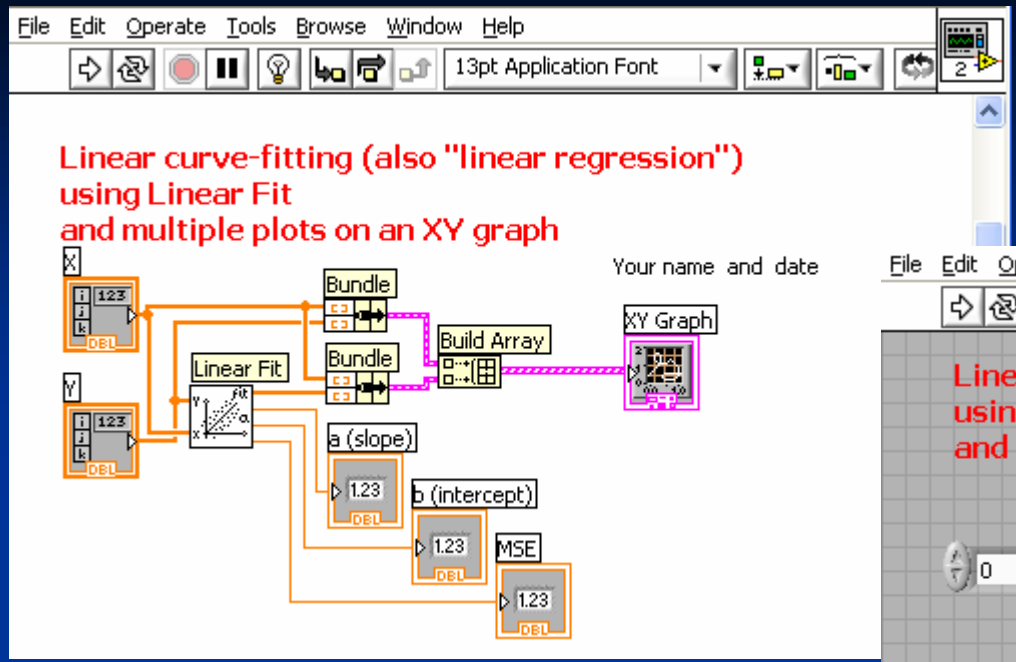
How to get "Linear Fit"; what are its inputs and outputs? What is "Build Array" for? How to add an extra input? What are the two inputs and output of "Build Array" ?

Linear Fit: All Functions/Analyze/ Mathematics/Curve Fitting/
Inputs are data series X and Y;
Outputs are best fit series Y'=aX+b;
Coeff. a (slope); coeff. b (intercept); and MSE (Mean Square Error, a parameter which is equivalent to our "standard deviation" in doing curve fitting with Excel.

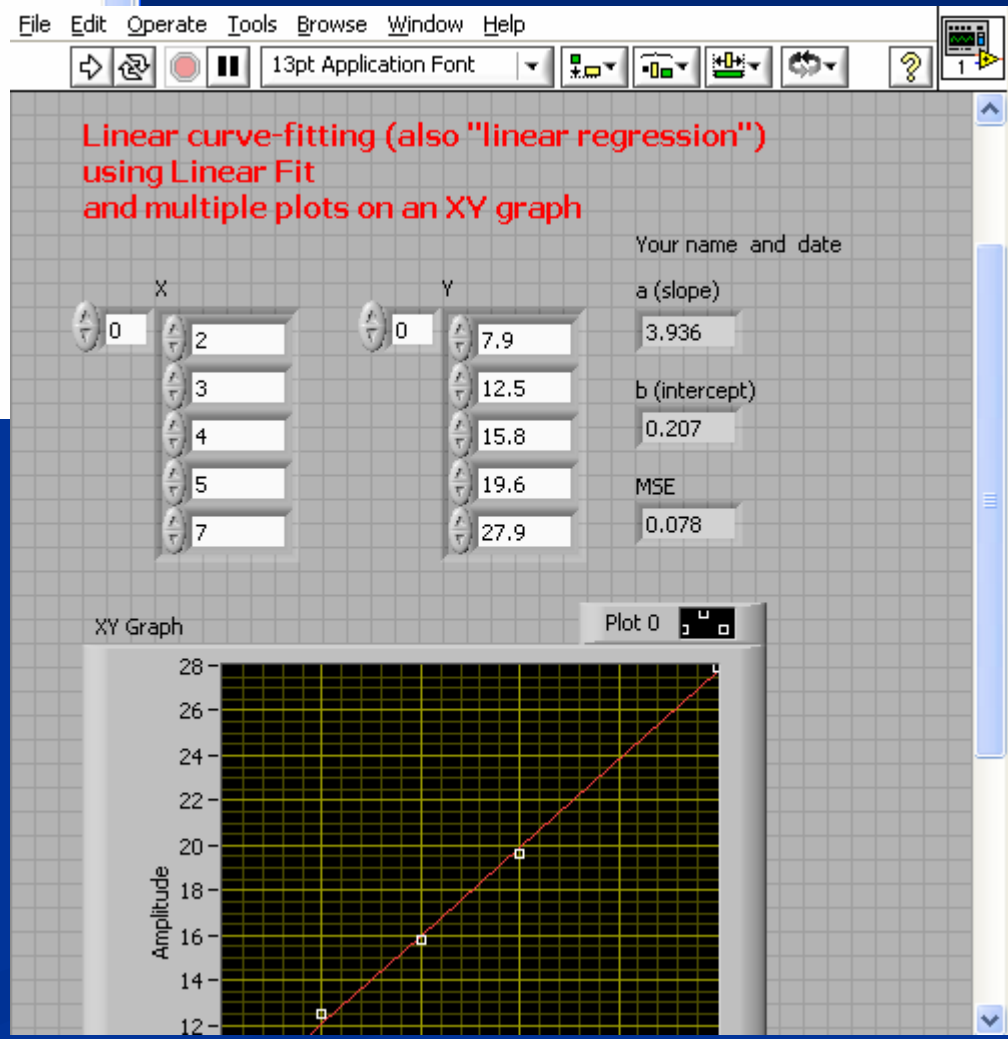


Bundle: All Functions/Cluster/
Bundle 1 takes X and Y; bundle 2 Takes X and Y'

Build Array: All Functions/Array/
Right-click on its left side to "Add Input"
Upper input: XY (bundle 1); lower input: XY' (bundle 2)



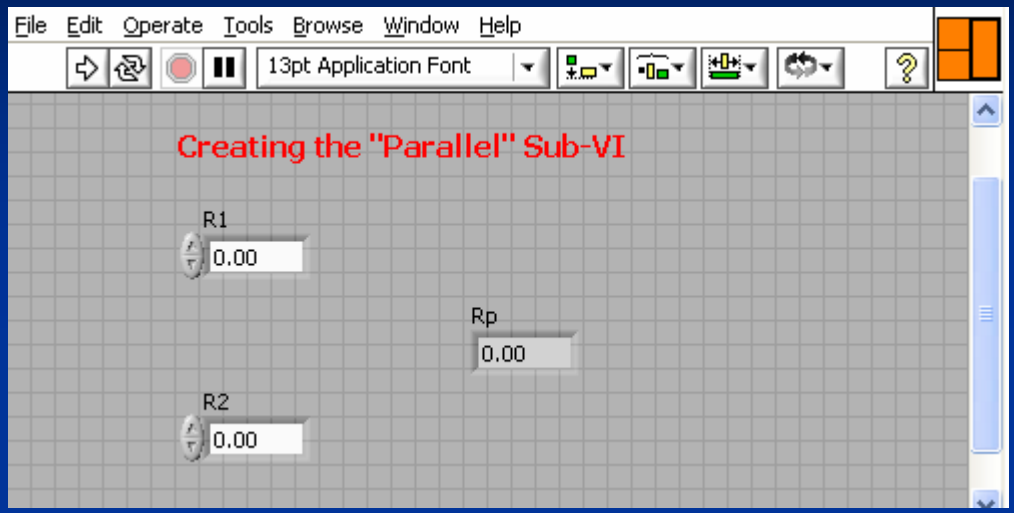
How to set the data points into "scattered mode"?



Wiring: rearrange icons for minimum wiring and least crossings.

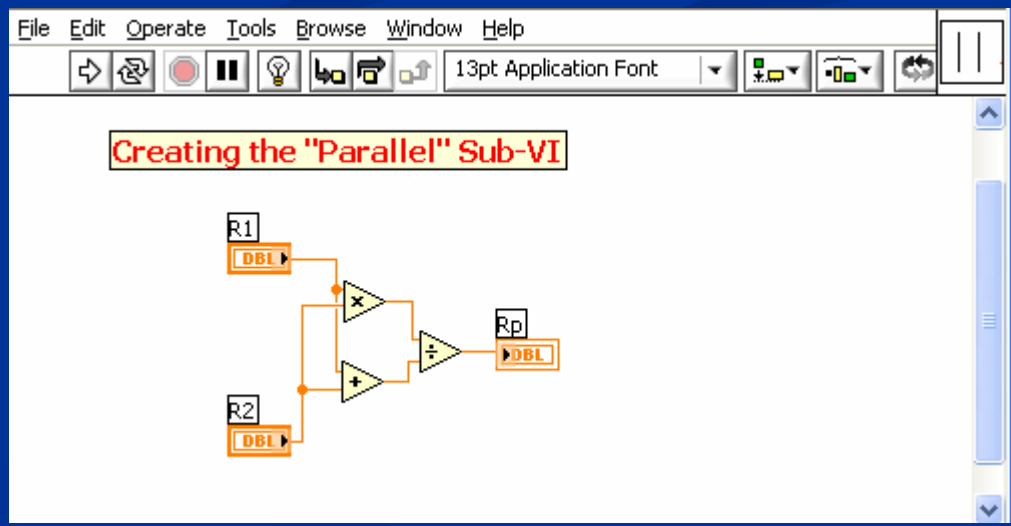
Testing: input data and check your results (remember non-grammar errors are not detected by the software). To show data Points as dots: right-click on "Plot 0" Select Common Plots/Scattered Plots.

Circuit 3 with Sub-VI (Extra Credits)
Step 1: Creating the Parallel VI:

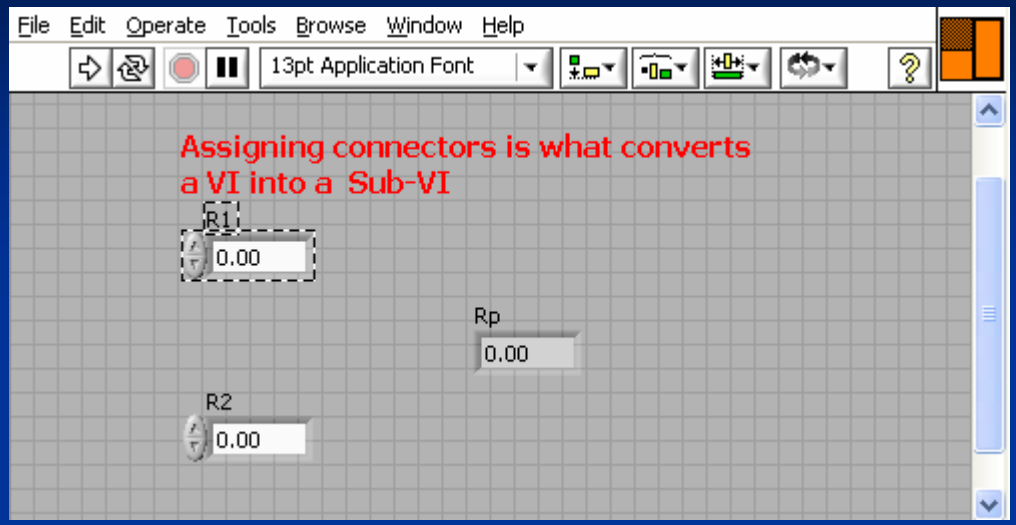


(a) Place two numeric controls labelled As R1 and R2, and one indicator as Rp into the Front Panel

(b) In the Block Diagram produce Rp using the formula:
Rp= (R1*R2)/(R1+R2)

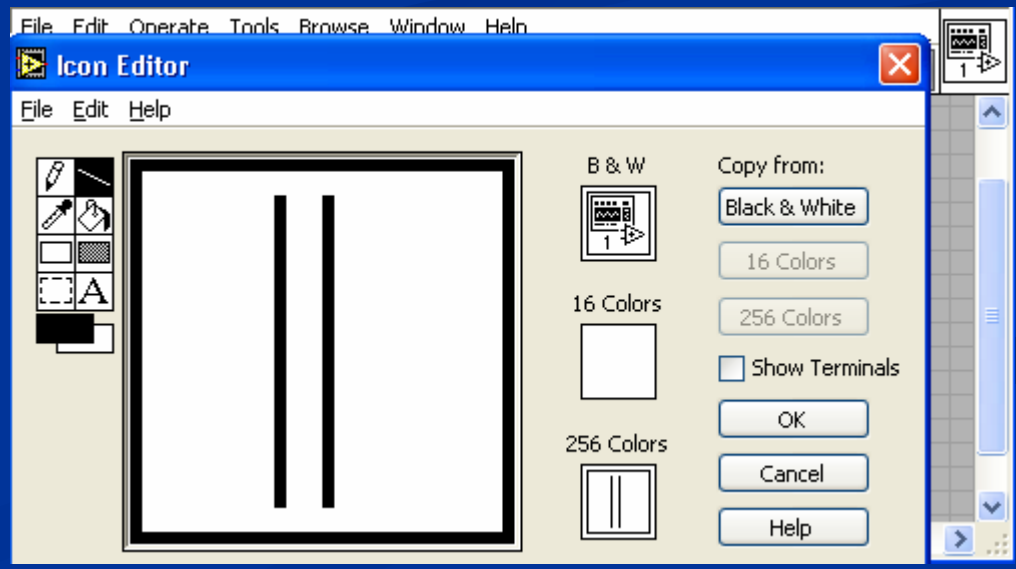


Step 2: Making "Parallel VI" becomes a "Parallel SubVI"

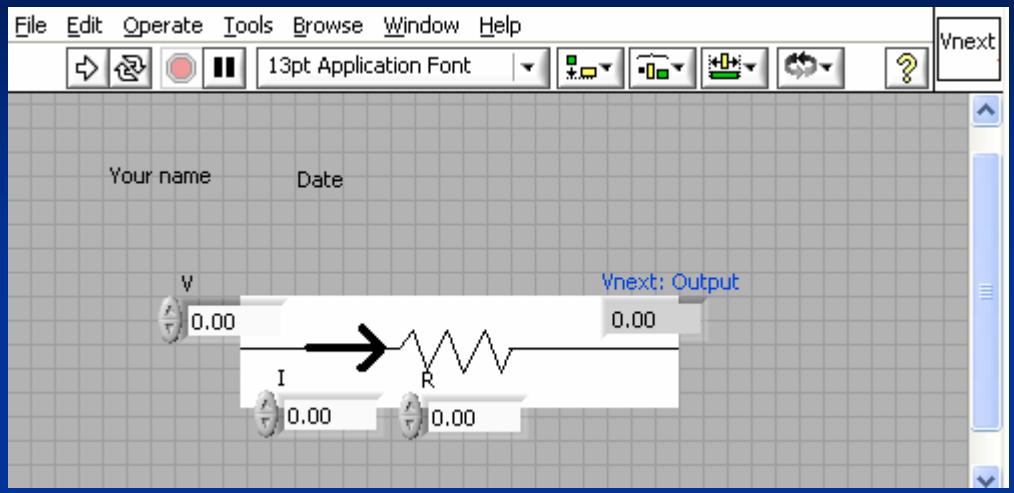


(a) Right click on the icon, select Show Connectors, then pair the left connectors with numeric controls (by right clicking on one and another consecutively) and the right ones with numeric indicators

(b) Double click on the icon, use dotted rectangle to select icon contents, then hit backspace to delete. Use line to draw two vertical bars to represent the Parallel subVI. Then click OK.

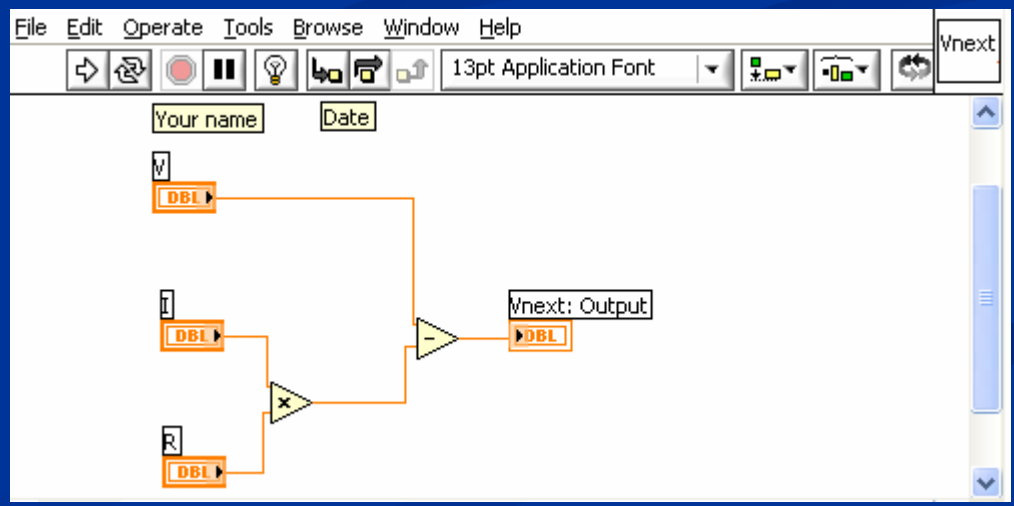


Step 3: Creating the Vnext subVI:

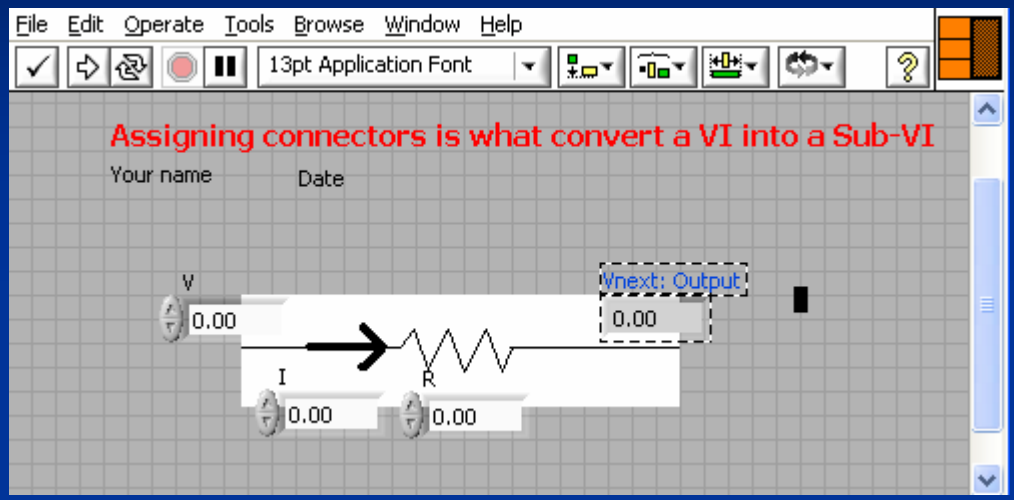


(a) As with the Parallel subVI, we start Creating the VI by placing three numeric Controls labelled as V, I, and R, and One numeric indicator as Vnext

(b) In the Block Diagram, Vnext is given by the expression:
Vnext = V – I*R



Step 4: Assigning connectors and editing icon in Vnext subVI



(a) To convert the Vnext VI into a subVI connectors are assigned As with the Parallel subVI

(b) And the icon is edited to mark its function

In HW4.3 you are asked to solve for the same circuit as in HW4.2 but now using the Parallel and Vnext subVI's that are called into the Block Diagram via All Functions/Select a VI.

The use of subVI or subroutine is the programmer trick to simplify the reading and makes it easier to spot a bug, also modifications to a subroutine is much faster than locating and modifying repeatedly all occurrences within the program.