

## Guided Tour 3 - Histograms and Curve Fitting

In this tour we will explore the Histogram operation and will perform a curve fit using weighting. The optional last portion creates a residuals plot and shows you how to create a useful procedure from commands in the history.

### Starting Guided Tour 3

1. **If Igor is already running, activate it and choose File→New Experiment.**  
In this case, skip to step 2.
2. **Double-click your Igor64 alias or shortcut.**  
Instructions for creating this alias or shortcut can be found under **Creating an Igor64 Alias or Shortcut** on page I-13.  
On Windows, you can also launch Igor64 using the Start menu.
3. **Choose Misc→Preferences Off.**  
Turning preferences off ensures that the tour works the same for everyone.

### Creating Synthetic Data

We need something to analyze, so let's generate some random values.

1. **Type the following in the command line and then press Return or Enter:**  
`SetRandomSeed 0.1`  
This initializes the random number generator so you will get the same results as this guided tour.
2. **Type the following in the command line and then press Return or Enter:**  
`Make/N=10000 fakeY = enoise(1)`  
This generates a 10,000 point wave filled with evenly distributed random values from -1 to 1.

### Histogram of White Noise

Here we will generate a histogram of the evenly distributed "white" noise.

1. **Choose the Analysis→Histogram menu item.**  
The Histogram dialog appears.
2. **Select fakeY from the Source Wave list.**
3. **Verify that Auto is selected in the Output Wave menu.**
4. **Uncheck any checkboxes in the dialog that are checked, including the Display Output Wave checkbox.**
5. **Click the Auto-set Bin Range radio button.**
6. **Set the Number of Bins box to 100.**  
Note in the command box at the bottom of the dialog there are two commands:  
`Make/N=100/O fakeY_Hist;DelayUpdate`  
`Histogram/B=1 fakeY,fakeY_Hist`  
The first command makes a wave to receive the results, the second performs the analysis. The Histogram operation in the "Auto-set bin range" mode takes the number of bins from the output wave.
7. **Click the Do It button.**  
The histogram operation is performed.  
Now we will display the results.
8. **Choose Windows→New Graph.**
9. **Select fakeY\_Hist in the Y Waves list and "\_calculated\_" in the X list.**