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 an 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.**