LabPlot 2 Manual

created for Physics 3700

How to Enter Data

Entering Data

First, create a new spreadsheet by clicking the 📰 icon in the header. This creates a default spreadsheet with two columns and 100 rows.

To add rows, right click on the row header on left side of the spreadsheet and use the dropdown menu. To delete rows, select the rows you want to delete and use the same dropdown menu. Use the same method to edit columns.



Manipulating Data

To generate new data using data in the spreadsheet, create a new column, right-click on the column header, and select "Generate Data" and then "Function Values".

Set x equal to whichever column of the spreadsheet your data will be based off, and then type your function in the text box.

To view the statistics of a column, right-click on the column header and select "Column Statistics". This displays the mean, variance, standard deviation, and other statistics from the data.





How to Make a Plot

Creating the Plot

You can create an xy-plot using data from a spreadsheet. In your spreadsheet, make sure the name of your x-axis column includes [X] and the name of your y-axis column includes [Y]. If they don't, right-click on the column header and select "Set Column As" to adjust column names.

Select the columns of the spreadsheet you want to use for your plot. Right-click the column header, select "Plot Data" and then "xy-Curve". In the pop-up window, select "New Plot Area in a new Worksheet" and click "Plot".



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Editing the Plot

To edit the different elements of your plot, you will first need to double-click anywhere on the plot to bring up a new window. Here, you will be able to edit each element of the plot that you select.

Click on the white border outside the black box to edit the size of your plot. Click on the white background inside the black box to edit the plot's x-range and y-range.

*If you ever zoom out on the graph and the axes get messed up, select "Auto" under **X-Range** and **Y-Range** to fix it.





Editing the Axes

Click anywhere on the axes to edit them.

In the editing window, under "Title" you can edit the axis name and font size.

Under "Ticks" you can edit the number and style of ticks on the axis.

Under "Labels" you can edit the tick labels and their font size.

Under "Grid" you can edit the vertical lines of the plot's grid.





Editing the Graph

Click on the graph directly to edit it.

Under "Line" you can edit the style of the line connecting the points, or disable the line entirely.

Under "Symbol" you can add a symbol at each data point and edit the style of the symbols.

Under "Error Bars" you can add error bars for each data point (see next slide).





Adding Error Bars

First, enter the error for each point into a column of your spreadsheet. You can generate error values from existing columns using the formula entry (p. 4) or enter error values manually or create an error column (more later).

To create error bars for this class, under Y Error select "Symmetric". Under "Data, +-" select the column of your spreadsheet containing your error values. Under Format, you can add caps to the error bars.





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Adding a Best-Fit Line

To add a best-fit line, right click on the graph, select "Analysis" and then "Fit", and then pick the appropriate type of best-fit line.



Best-Fit Line for a Gaussian Distribution

First, create a best-fit line and select "Gauss" from the options (see the previous slide). If the editing window doesn't appear, double-click on the plot and then click on the best-fit line in the Project Explorer window on the left side of the screen.

Under "Y-Weight" select "Instrumental" and then select the column of your spreadsheet with the error on each point.

Change the category to "Custom" and the f(x) field will autofill with the Gaussian function in editable form.

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Best-Fit Line for a Gaussian Distribution

The parameters listed are the variables in the Gaussian function. "a" is the normalization constant, "s" is the standard deviation, and "mu" is the mean. Enter the best guess of the values under "Start value".

Click "Run" to fit the curve and the fitted values will be displayed in the Results pane. Check the "Fixed" box if you want to a particular parameter to be fixed.

The χ[^]2 value can be found under "Goodness of fit", in the highlighted boxes in the image.

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How to Make a Histogram

Creating the Histogram

You can create a histogram using data from a spreadsheet.

Select the column you want to use for your plot. Right-click the column header, select "Plot Data" and then "Histogram". In the pop-up window, select "New Plot Area in a new Worksheet" and click "Plot".



Adjusting Bin Size

First, double-click on the white background inside the black box and adjust the **X-Range** if needed.

Click on the graph to adjust bin size. In the "General" tab under **Binning**, change the method to "By Number" and change the bin count to the desired number of bins. Under **Bin Ranges**, deselect "Auto" and adjust the range if needed.

If you have gridlines, you can adjust the settings until they align.





Adjusting Tick Labels

Click on the horizontal axis. Then under "Ticks", your can adjust the number of ticks.

If you would instead like to center the label of each bin, you would need to increase the 1st Tick Offset.

*To create custom bin labels, create a new column in your spreadsheet with the desired bin labels. Under "Label Type" select Custom Column and select the new column under "Label Column."







Fitting a histogram

Create a new column on the right and copy over the bin values. Right click on the new data and select "Manipulate Data", "Ladder of Powers", and \sqrt{x} for error bars given by the square root of the number of entries. You can now plot the data and fit.

Note: remove any entry with zero count or else the program would not fit properly.

