

Using KyPlot

1 Introduction

KyPlot is a Windows based graphing program which you will use for making plots of data in Physics lab. It also has statistical abilities you might find useful, such as averaging, standard deviation, *etc.* The use of the program is fairly intuitive for those used to pointing and clicking, and will be easy for those used to spread sheets like Quattro Pro and Excel. The reason we use KyPlot instead of these spread sheets is two-fold: 1.) we require that a program draw a fitted curve to the data points on the plot, and that the fit parameters for the curve have calculated errors which can be used by the student; 2.) KyPlot is FREE; most spread sheets are not.

2 Starting the Program and Entering Data

1. To start the program, simply double-click on the KyPlot icon.
2. To enter data, simply click at the top of a column and type the numbers in. Enter or arrow keys will move to another cell. **It is best to put the numbers into columns, and to put two columns you wish to eventually plot on a graph (as x and y) next to each other.**

3 Creating a Graph/Plot

1. Click and drag over the data you have entered into columns. This will highlight your data, and it needs to stay highlighted throughout – so be careful not to un-highlight. If you do, then click and drag again.
2. Click on the “Graph” pull-down menu and then “Create Graph.”
3. A window pops up on which no changes should need be made, but look at it and familiarize yourself with it anyway. Click on “OK.”
4. Another window appears, and you should click off the checked box (under the Show area) indicating the “lines” option – NEVER connect the dots in physics.
5. Click on “OK.” The graph should now appear.
6. To add a title (and axis labels) simply double-click on “Title” and a window will appear. Type in what you need, and note that superscripts, subscripts, and Greek letters can be done as well.

4 Regression

Regression is the fitting of a curve to the data. KyPlot will do more than we generally require for intro physics, so the following is what you need to know.

1. Click on the spread sheet, making it the active window. Your initial two columns should still be highlighted from making the graph.

2. Click on “Statistics,” then “Regression Analysis,” then “Simple Regression.”
3. A window appears which you should look at, but you should only need to click on “OK.” The program assumes your data is in columns with x as the left column. If this is not the case, you can adjust the values under the “X Range” and “Y Range” areas on this window.
4. Much info is then placed onto the spread sheet below your data. Most of this can be ignored, except for the part under “Regression Coefficient.” This tells us the slope (“b1:x”) and intercept (“b0”) and the errors on them are in the third column under “SE.” The errors should be multiplied by 1.96 as per the **Error Analysis** laboratory instructions.
5. At this point you should highlight the first three columns of the two rows with the b’s (including the b’s) with the mouse. Then click on “Edit” and then on “Copy.” Then bring the graph up as the active window, click on “Edit” and then “Paste.” This will put the information on the graph once you click “OK” on the window that pops up. You can move and re-size this information with the mouse. Note that you can also do this to the graph as well.

5 The fit line on the Plot

We want to see the line corresponding to the regression on the plot as well. We will now do this.

1. Keeping the figure as the active window, click on the graph so that the blue box appears around the graph. Then click on “Graph” and then on “Fit.”
2. A window appears which has many options. Under *Menu* change *Function Fit* to *Polynomial Regression*. This changes some of the window.
3. Set the “Degree” to 1.
4. Click on “Apply Fit” – this calculates the first order regression (again) and draws it on the graph as a line.
5. Click on “Close.”

6 Printing

To print the graph, click on the printer icon near the top, then click “OK” on the pop-up window.

7 Other Information

It is often useful to do some column math, such as squaring a column or square rooting a column, *etc.* To square a column, simply click on an empty column, then enter in the formula, starting with an equals sign: =B1^2. Press enter, and the value of cell B1 appears squared in the empty place you first clicked. Now click on this cell, and drag down for all cells to be filled. Then click on the icon along the top tool bar of the KyPlot window that shows a white arrow pointing down on a blue background. This will repeat the calculation you did in the first cell for all the next cells over which you have dragged.