

Sensor Log Investigation

An XY graph shows the relationship between two sets of numbers. Such graphs can be used to illustrate many types of data. Graphs are used to communicate information visually. Facts are made clearer and more understandable with the use of a graph.

Explorer's Guide

Before You Start

Paul's weight in pounds for different years is given below. Plot a graph on a grid paper with the data given below. Did Paul's weight increase or decrease over time?

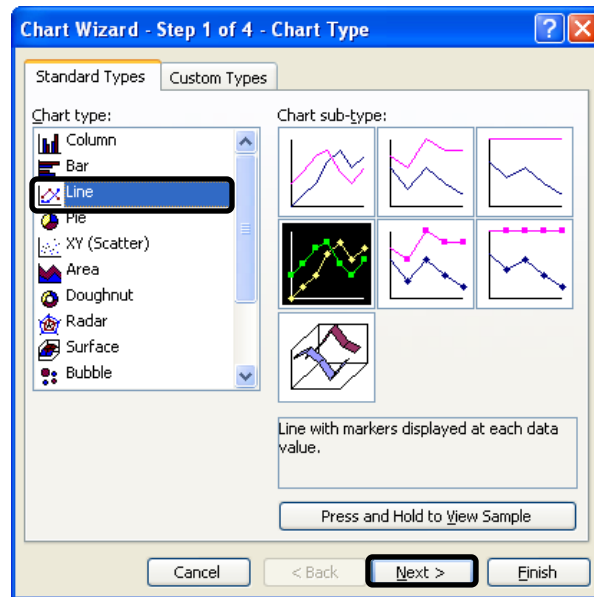
Year	Weight in lb
2000	28
2002	35
2004	38
2006	45
2008	55

Learning by Doing

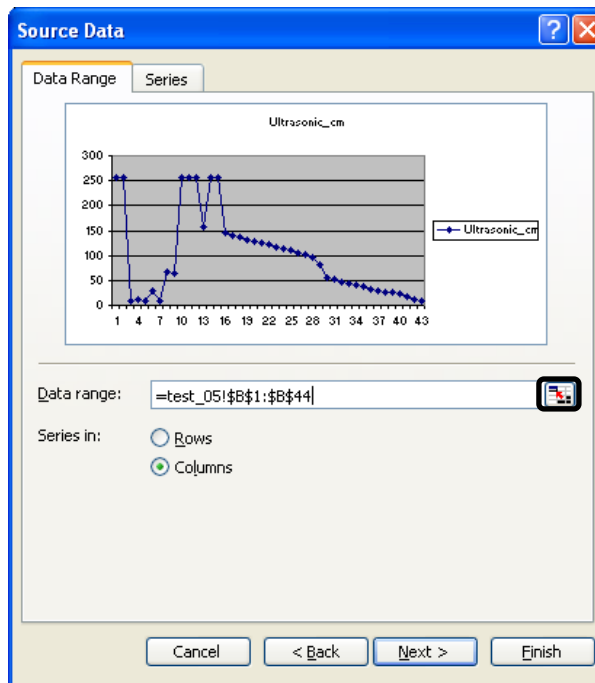
1. Start Microsoft Excel software. Navigate to the appropriate folder and open file robo_data. Robo_data contains the data saved while navigating the robot and testing the different sensors.
2. Click *Chart Wizard* button in the Excel toolbar. The button has a little graph inside of it as the icon. If you can't see the icon or it's not on your toolbar, click Insert menu > Chart.



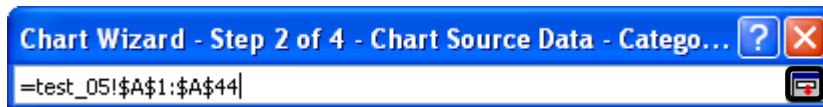
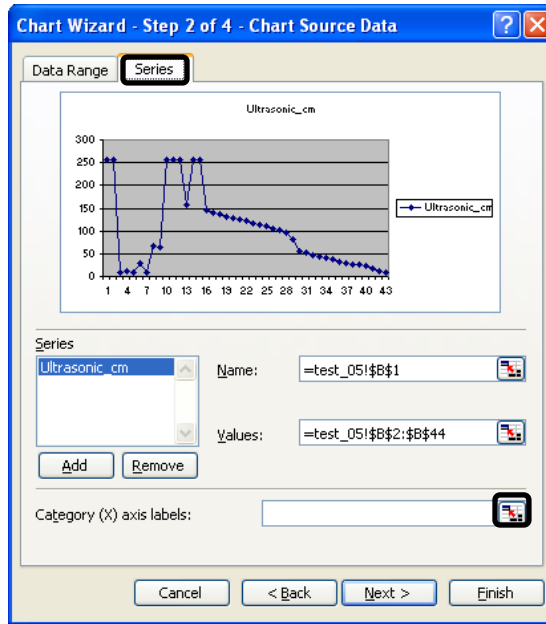
3. In the *Chart Wizard*, select line chart type as shown below.



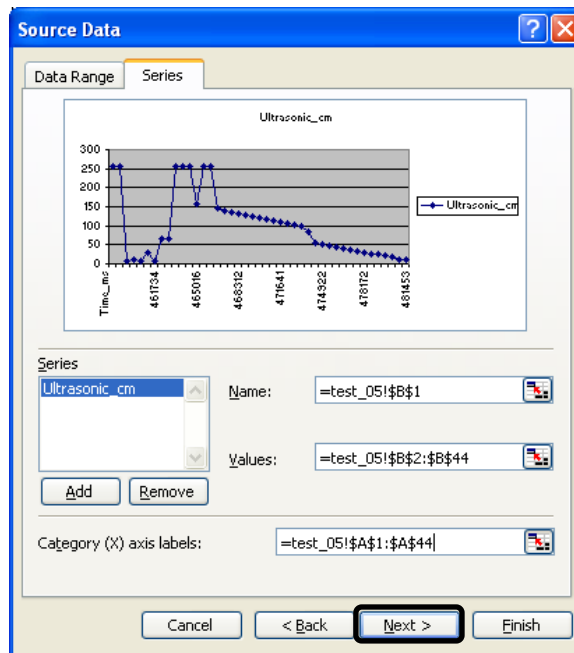
4. Click Next to go to Step 2. In step 2 select the cells containing ultrasonic values to specify the data range. Click on the Series tab.



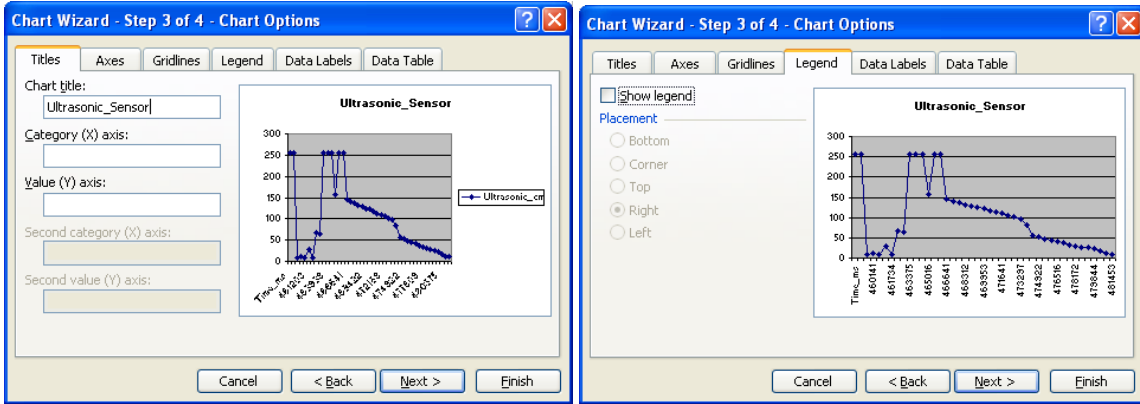
5. Select the cells containing Time_ms values to specify the category (X) axis label.



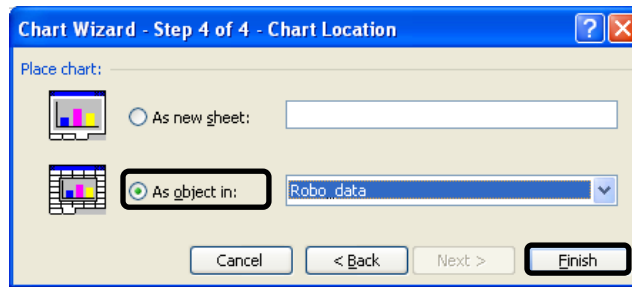
6. Your chart wizard should be as shown below.



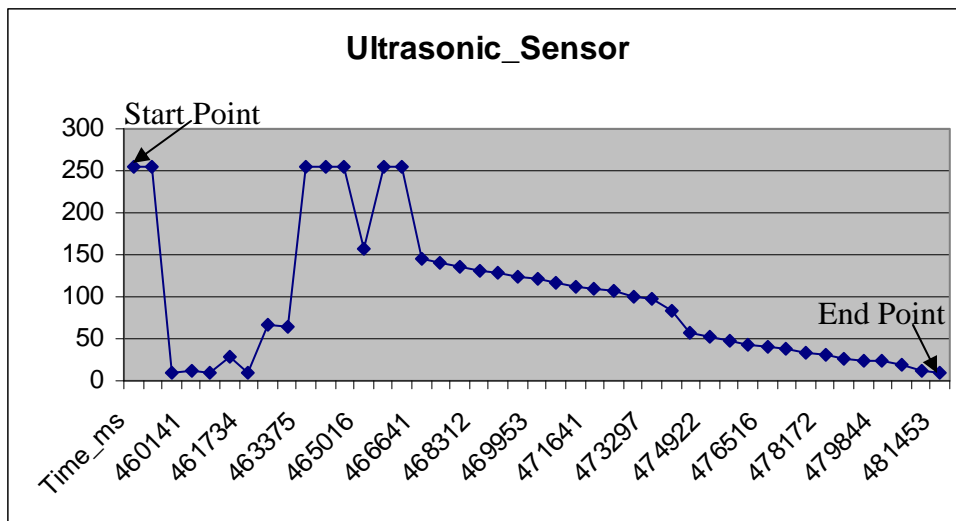
7. Specify the title in step 3 of the chart wizard as shown below. Click on the Legend tab and uncheck show legend.



- Now that you are done specifying the data on both the axis, place the chart as objects in Step 4 as indicated below.

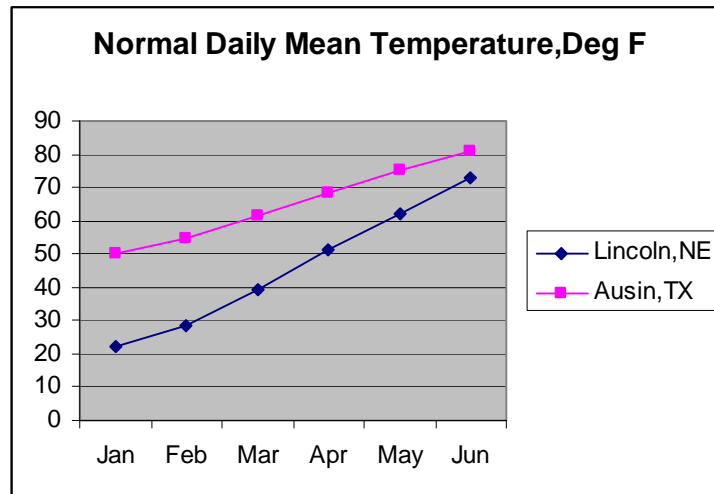


- Your final graph should resemble the one below.



How Does It Work

Excel is a powerful tool used to create charts and graphs for small or large amounts of data. Charts are visual representations of data on a spreadsheet.



An example of a line graph is shown above. Here the X-axis or the horizontal axis represents the months from January to June and Y-axis or the vertical axis represents the normal daily mean temperature in degrees Fahrenheit.

Data series identifies the information charted. In the above example, data series contain the normal daily mean temperature, by cities Lincoln,NE and Austin,TX for a particular year. If you need to delete or change the references to the cells containing the information, you will need to edit the data series.

A data range is a range of cells that contain data in a data series. To type a range, type the range's initial cell's ID, a colon, and the range's final cell's ID. For example: The data range C2:C5 references to the cells C2, C3, C4, and C5.

Charts convey information. It is a good practice to have a title and axis labels for your chart. Once your chart is placed as an object on your worksheet, it can be moved anywhere on your worksheet. You could even resize the chart as needed. While your chart may be placed on top of some worksheet information, the information still exists.

Additional Challenge

Collect data as in Robot Sensor Exploration activity and create graphs for light sensor and sound sensor.

Vocabulary

Graph Title: The title that appears at the top of the graph describing the graph.

Axis Labels: The labels that appear along the x and y-axes describing what is being measured.

*Viacheslav Adamchuk and Shana Thomas
Phone: 402-472-8431
E-mail: vadamchuk2@unl.edu
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