

Lecture #12 (Excel Lecture C)

Reading Assignment:

Chapter 14 in Engineering Fundamentals – An Introduction to Engineering, 3rd Edition, by Saeed Moaveni.

Example: *Using Lookup Tables in Microsoft Excel*

Example: *Using Histograms in Microsoft Excel*

Statistical Functions in Excel

Create a list of values (Ex: Recent gasoline prices) and determine the following:
Mean, Max, Min, Median, Mode, Number, and Standard Deviation

Histograms

Use a histogram to find out how many of the values in the list of gas prices fall into selected ranges (perhaps in 10 cent increments). Note: The BIN values contain the *upper limits* for each range.

Example BIN:

BIN	Comments
2.40	Value < 2.40
2.50	2.40 < Value < 2.50
2.60	2.50 < Value < 2.60
2.70	2.60 < Value < 2.70

Perform a histogram using TOOLS - DATA ANALYSIS - HISTOGRAM from the main menu (if DATA ANALYSIS does not appear under TOOLS, first pick TOOLS - ADD-INS and then check the box next to ANALYSIS PACK).

See the example: *Using Histograms in Microsoft Excel*

Lookup Tables and Lookup Functions

Use a lookup table and lookup function to calculate the postage and handling charges to mail packages using a rate schedule as follows. The form of the LOOKUP function is as follows:

LOOKUP(data value, range of comparison values, range of values to use)

Create a spreadsheet with the cost of several items in one column and use a lookup table and lookup function to determine the shipping charge according to the table provided below.

Purchase Amount	Shipping Charge
Up to \$10.00	5%
Up to \$25.00	4%
Up to \$50.00	3%
Up to \$75.00	2%
Up to \$100.00	1%

See the example: *Using Lookup Tables in Microsoft Excel*

Graphing curves with multiple x-series

Excel can easily be used to graph multiple curves. The curves may have

- Different y-values and common x-values (perhaps most common)
- Different x-values and common y-values
- Different x-values and different-y values

Example: Graph the following information using Excel (three curves on one graph).

x	y1	y2	y3
0	10	13	18
2	20	26	36
4	30	39	54
6	40	52	72
8	50	65	90
10	60	78	108
12	70	91	126

Example: Graph the following information using Excel (three curves on one graph).

x1	x2	x3	y
0	1	0.5	10
2	3	2.5	20
4	5	4.5	30
6	7	6.5	40
8	9	8.5	50
10	11	10.5	60
12	13	12.5	70

Example: Graph the following information using Excel (three curves on one graph).

x1	x2	x3	y1	y2	y3
0	1	0.5	10	13	18
2	3	2.5	20	26	36
4	5	4.5	30	39	54
6	7	6.5	40	52	72
8	9	8.5	50	65	90
10	11	10.5	60	78	108
12	13	12.5	70	91	126

Other types of graphs:

x-y (scatter) graphs are commonly used in Engineering, but several other types of graphs are also very useful at times. Excel has a large variety of graph types available. Several are explored below.

Line charts versus Scatter Charts

Scatter charts are used most commonly to graph measured x,y data. A common error is to use a line chart instead of a scatter chart. Line charts are intended for cases where the data on the x-axis is non-numeric, so the x values are simply ignored and are spaced evenly. Line charts work well when the x-axis shows days of the week or months, but they can give a misleading impression with numeric data. Also note that since line charts treat the x-axis data as non-numeric, Excel does not give the option of using a log scale for the x-axis. (What is the log(January)?)

Example: Graph the data below using both a scatter chart (with a smooth curve added) and a line chart. The scatter chart will give the correct graph. The line chart will be misleading.

x	y
1	10
2	20
20	30

Example: Graph the following data using a:

- *Line chart*
- *3D line chart*
- *Bar chart*
- *3D bar chart*
- *Column Chart*
- *Pie chart*
- *3D pie chart*
- *Donut*

College Major	Number of Students
Engineering	120
Physics	50
Math	40
English	150
Sociology	250

Example: Graph the following data using a(n):

- *Area chart* (what is meant by the entire area?)
- *Line chart*
- *3D bar chart*

Month	Labor	Materials	Operational Expenses
Jan	\$8500	\$2400	\$4000
Feb	\$8000	\$2600	\$3975
Mar	\$9000	\$2800	\$4100
Apr	\$9000	\$2950	\$4075
May	\$8800	\$3075	\$4150