

Descriptive Statistics

OVERVIEW

In this lab, you will become familiar with Excel's Function Wizard to calculate basic descriptive statistics.

OBJECTIVES

By the end of the laboratory, you will be able to

- Use the function wizard to calculate mean and standard deviation

EQUIPMENT

- PC with *Microsoft Excel 97* or higher
- Computer diskette to save files

NOTE



- There may be small differences in procedures between different versions of Excel.

BACKGROUND MATERIAL

Excel has built in functions to make calculating easier for the user. These functions are found under the Function Wizard. The function wizard can be found by selecting Insert > Function or by clicking on the ***f*_x** icon.



Excel Lesson

Note: The computer icon, , indicates you will need to complete the procedures on the computer. The book icon, , indicates that you will need to read the information.



Getting started.

- Open Excel.
- Put your name(s) in the first column, starting at the top row.
- Put the date below your name(s).
- Adjust the width of the column to fit your names.
- Refer to the *Introduction to Excel* lesson if needed.
- Read the scenario below and follow the instructions. Hand-in the print out.



Enter the data from the scenario below.

Scenario

An individual took measurements of the temperature and the amount of water s/he consumed during a three-hour period outside. The data was collected for seven random days during the summer.

Temperature (F)	Water Consumption (ounces)
75	16
83	20
85	25
85	27
92	32

97	48
99	48

1. **Enter the column headings.**
 - Enter "Temperature (F)" in the cell **C1**.
 - Enter "Water Consumption (ounces)" in **D1**.
2. **Enter the data.** Enter the corresponding temperatures and water consumption in columns C and D respectively. Do not change the order of the items. Make sure the items were entered as numbers not text.

Note:

Usually, it is best to take time to think about how you will be analyzing the data before you enter it. That can save trouble later. However, if your data is not entered in the best format the first time, you can manipulate it and may not have to re-enter it.

COPYING FORMULAS

You can add columns together, calculate the sum of a column or each row, or convert a column to their Z-scores.



Assume that the data collector for the temperature/water example learned that the thermometer that was used gave incorrect readings. In fact, the thermometer read the temperature ten degrees too low. So, we want to create a column called "Temperature plus10" and have Excel add ten degrees to each temperature in column C.

1. Label cell **E1** as "Temp plus 10." Press enter.
2. Put your cursor in cell **E2**.
3. First type the equal sign, =, then click on cell **C2**, then type **+10**. (=C2+10 is what should be in the cell before you hit return.)
4. Press enter. The cell should now have 85 on the right side.
5. **Copying formulas.** To avoid having to repeat the process for every temperature, we can drag this formula down for the rest of the temperatures.
 - Put your cursor on the bottom right hand corner of cell **E2**. The cursor should change from a thick to a thin plus sign.
 - Hold down the left mouse key and drag the corner to the bottom cell **E3**.
 - Release the mouse. The number 93 should appear.

- Repeat the dragging process, but this time drag the corner of cell E3 to include all temperatures (i.e. to cell E8.)
- When you release the mouse, the temperatures plus 10 degrees should now be filled in.

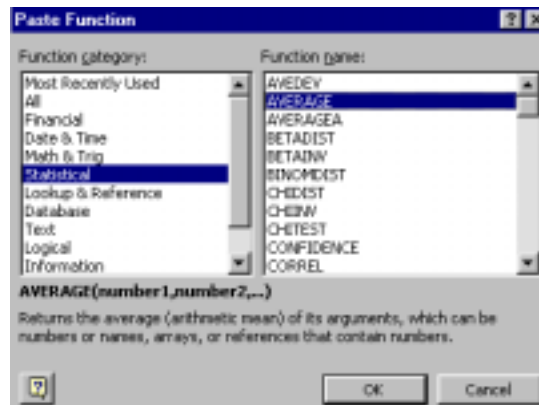
DESCRIPTIVE STATISTICS

Excel will conduct a variety of statistical calculations using the function wizard. (More complicated statistical applications can be completed using *Excel's* Data Analysis ToolPak, which will be explained in future lessons.)

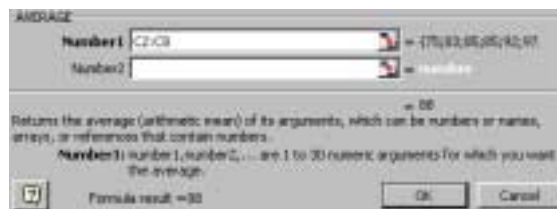


For the temperature/water data, find the mean and standard deviation.

1. In cell B10, type **Average**. In cell B11, type **Standard Deviation**. These serve as titles to know what the values that you will calculate represent.
2. Put your cursor in cell C10. The average will be placed here.
3. Select **Insert > Function**.
4. In the Function Category dialog box, select **Statistical**. In the Function Name dialog box select **AVERAGE**. Click **OK**. (See image below.)



5. In the Average dialog box, beside the **Number 1** field, make sure the data range says **C2:C8** since this is the range of the temperature data. Click **OK**. The number 88 should



appear in the cell.

6. Put your cursor in cell C11. The standard deviation of the temperature will be put here.
7. Select **Insert > Function**.


8. In the Function Category dialog box, select **Statistical**. In the Function Name dialog box, scroll down and select **STDEV**. Click **OK**.
9. In the Standard Deviation dialog box, beside the **Number 1** field, make sure the data range says **C2:C8** since this is the range of the temperature data. Click **OK**. The number 8.465... should appear. If it does not, delete the value and try again.
10. **Copying formulas.** To avoid having to repeat the process for the next two columns, we can drag this formula over for the water and the temperature plus ten degrees.
 - Highlight cells **C10 and C11**. Put your cursor on the bottom right hand corner of cell C11. The cursor should change from a thick to a thin plus sign.
 - Hold the left mouse button down and drag the cursor to the right, to the end cell **E11**. Release the mouse button.
 - All of the means and standard deviations should below their respective category.
11. **Check your solutions** with those in Figure 1.
12. **Formatting the numerical values.** To remain consistent with the decimal place rules, we will format mean and standard deviation to one decimal place.
 - Highlight all of the cells with the numerical values of mean and standard deviation. (Cells C10 through E11.)
 - From the menu bars, select the **decrease decimal places icon**.  Click this icon until each number has only one decimal place. (Note: because the average of the first mean was 88 with no decimal places, you may have to increase the number of decimal places in that cell before you can decrease them. The **increase decimal places icon** is to the right of the decrease decimal places icon.)
13. **Save** this workbook with the filename **excel lab 2**. Refer to the *Introduction to Excel* lab if you need help with this.
14. **Print** the worksheet with your means and standard deviations.

Figure 1. Solutions.

	A	B	C	D	E
1	Excel Lab 2 Solutions		Temperature (F)	Water Consumption (ounces)	Temp plus 10
2	Date		75	16	85
3			83	20	93
4			85	25	95
5			85	27	95
6			92	32	102
7			97	48	107
8			99	48	109
9					
10		Average	88.0	30.9	98.0
11		Standard Deviation	8.5	12.8	8.5