3 Sorting, Backups and Enhanced Tables

3.1 Sorted Lists

There are many cases when we find a sorted list helpful. WORD has simple sort functions, as does EXCEL. Such lists help the viewer grasp the range of variation better than an unsorted list and immediately reveal the minimum and the maximum values.

3.2 Simple Sorting in WORD

Figure 3-1 shows data that the user wants to sort so that each column will be sorted in ascending order – all the data in the first column in order, with any values that are the same in the first column sorted by the value of the second column, and then again using the third column.

Figure 3-1. Table of values to sort in WORD.

| Variable 1	Variable 2	Variable 3
229	6.5	8.0E+03
433	5.3	8.0E+03
462	8.9	1.1E+04
229	7.9	1.1E+04
126	9.1	8.0E+03
126	9.1	1.1E+04
492	7.4	1.1E+04
192	7.4	1.1E+04
126	5.3	1.1E+04
462	6.6	1.1E+04
211	9.4	1.3E+04
126	7.9	1.1E+04
433	9.0	1.1E+04
170	7.1	1.1E+04
460	8.6	1.1E+04
229	6.6	1.1E+04
229	7.9	8.0E+03
211	9.4	8.0E+03
428	6.6	1.3E+04
211	9.5	1.1E+04

In WORD 2007, highlight the text to sort and select the **Sort** button (Figure 3-2)

Figure 3-2. Word sort button.
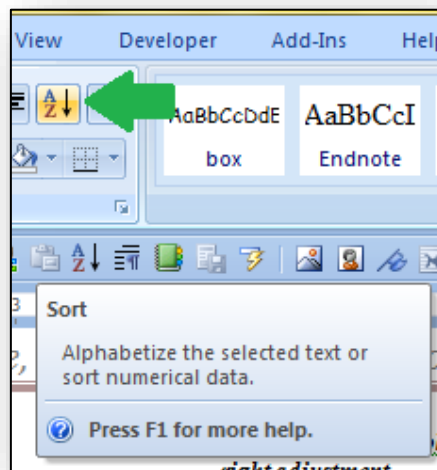
to start the **Sort Text** dialog box (Figure 3-3).

Figure 3-3. Word sort dialog box showing options of what to sort by.
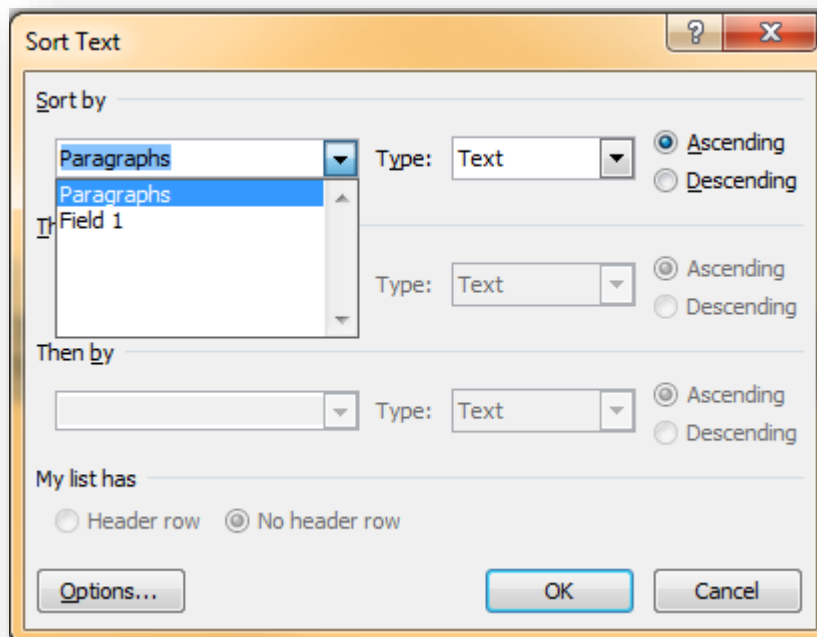
The sort can be ascending (e.g., from A to Z) or descending (Z to A). Clicking on the **Header row** buttons tells WORD whether to include the top row (if it's a header) or include it in the sort (if it's not a header). Selecting paragraphs is useful for blocks of information such as multi-line text in bullet points. Selecting fields uses the **Tab** characters we discussed earlier as separators defining Field 1, Field 2 and Field 3 corresponding to columns.

As you can see, the sort instructions in Figure 3-5 specify fields rather than paragraphs and the check in **Header row** converts the column references to the names in the first row.

Stipulating **Number** as the **Type** of variable is important, because sorting by text or date can result in different sort orders. Figure 3-4 shows the pull-down menu for the **Type**.

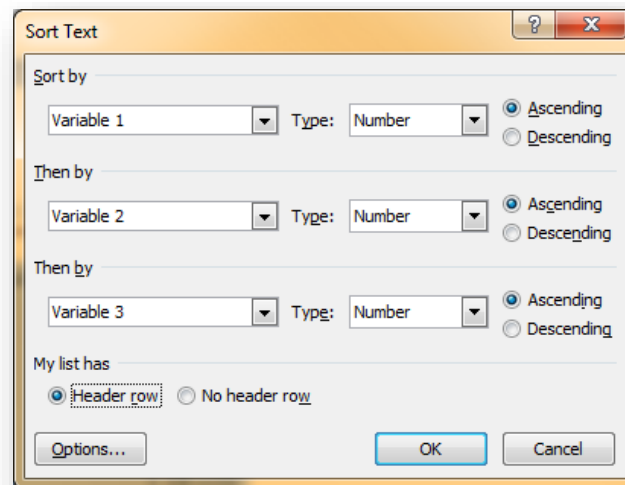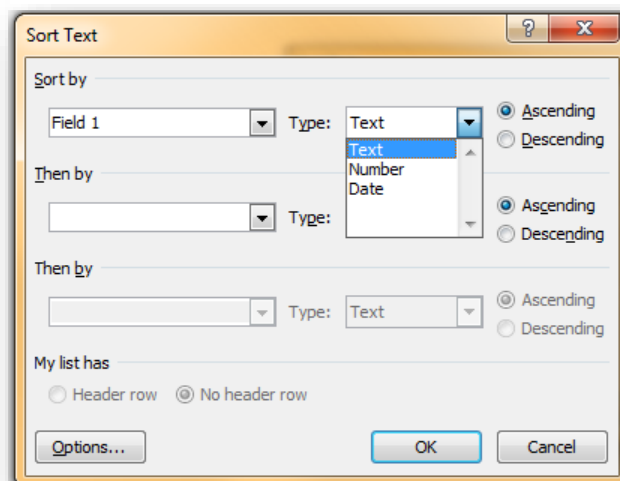**Figure 3-5. Sort instructions in Word for three columns of numerical information.**

Figure 3-4. Word sort options showing choice of three types of sort to use.

As shown in Figure 3-6, the sort results in sequences where values of the first column are in ascending order. Within groups of identical values of Variable 1 (e.g., 126), the lines (also called *records* from the terminology of databases) are sorted according to the value of Variable 2, the second column. For Variable 1 = 126, the records where Variable 2 is the same (= 9.1) are together and sorted by the value in the third column, Variable 3 (first 8.0E+03 then 1.1E+04).

Figure 3-6. Result of Word sort instructions.

Variable 1	Variable 2	Variable 3
126	5.3	1.1E+04
126	7.9	1.1E+04
126	9.1	8.0E+03
126	9.1	1.1E+04
170	7.1	1.1E+04
192	7.4	1.1E+04
211	9.4	8.0E+03
211	9.4	1.3E+04
211	9.5	1.1E+04
229	6.5	8.0E+03
229	6.6	1.1E+04
229	7.9	8.0E+03
229	7.9	1.1E+04
428	6.6	1.3E+04
433	5.3	8.0E+03
433	9.0	1.1E+04
460	8.6	1.1E+04
462	6.6	1.1E+04
462	8.9	1.1E+04
492	7.4	1.1E+04

3.3 Simple Sorting in EXCEL

The EXCEL Sort & Filter menu shown in Figure 3-7 offers both simple sorts and more complex sorting options (the Custom Sort… option). Filter is a useful function that shows selected values; we'll discuss that function later.

The easiest form of sorting simply sorts by the first column in a selected area of the spreadsheet. For example, Figure 3-8 shows information about sales for various salespeople. It would be convenient (and normal) to show these data sorted by the name of the salesperson. By highlighting the entire table and then using the Sort AZ↓ button, it's easy to sort automatically using that first column. The results are shown in Figure 3-9.

Figure 3-7. Excel sort & filter menu.

Figure 3-8. Excel table with unsorted sales figures.

Salesperson	Sales
Marcie	$ 909,460
Darlene	$ 1,153,452
George	$ 1,389,164
Charlene	$ 630,871
Bob	$ 979,272
Harold	$ 398,478
Louise	$ 1,193,042
Holly	$ 1,020,585
John	$ 1,159,705
Albert	$ 1,644,140
Samuel	$ 1,704,159
Mike	$ 324,598
Robert	$ 1,305,230
Edward	$ 516,562
Francine	$ 844,769
Sally	$ 951,054
Victor	$ 826,891
David	$ 130,049
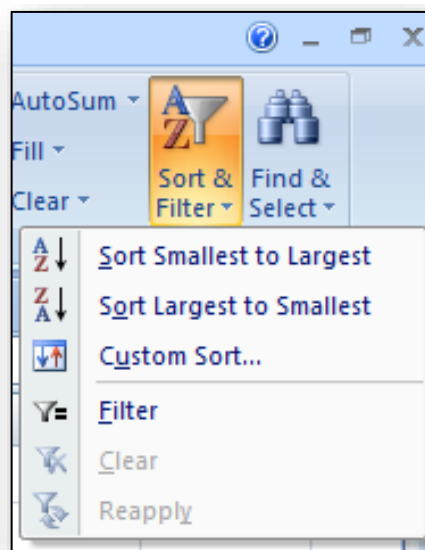
Figure 3-9. Sales data sorted automatically by first column.

Salesperson	Sales
Albert	$ 1,644,140
Bob	$ 979,272
Charlene	$ 630,871
Darlene	$ 1,153,452
David	$ 130,049
Edward	$ 516,562
Francine	$ 844,769
George	$ 1,389,164
Harold	$ 398,478
Holly	$ 1,020,585
John	$ 1,159,705
Louise	$ 1,193,042
Marcie	$ 909,460
Mike	$ 324,598
Robert	$ 1,305,230
Sally	$ 951,054
Samuel	$ 1,704,159
Victor	$ 826,891

3.4   Advanced Sorting in EXCEL

How do we sort by a column that is not the leftmost in our range? To do so, activate the **Sort & Filter** functions shown in Figure 3-7 and click on the **Custom Sort…** option. The menu shown in Figure 3-10 appears and one can select a sort field (in this example, the Sales figure column) and the direction of the sort (here, a downward sort putting the highest sales figures at the top of the sorted results). It's useful to select the label row as well as all the data and to click the **My data has headers** box: the names defined in the label row then appear in the dialog box instead of just showing the EXCEL column name (Column A, Column B, and so on). The rest of the process is similar to what you have learned about advanced (multi-field) sorting in WORD.

Figure 3-10. Excel sort options showing selection of second column (Sales) as the primary sort field.
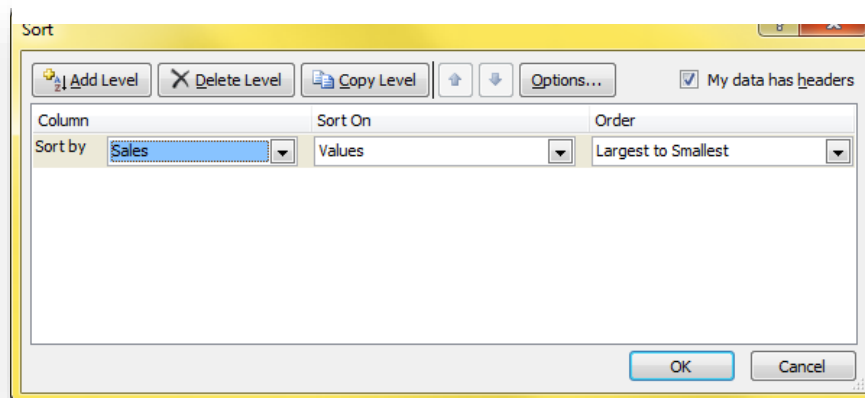
The results of this sort are shown in Figure 3-11.

Figure 3-11. Data sorted by sales with highest sales at top.

Salesperson	Sales
Samuel	$ 1,704,159
Albert	$ 1,644,140
George	$ 1,389,164
Robert	$ 1,305,230
Louise	$ 1,193,042
John	$ 1,159,705
Darlene	$ 1,153,452
Holly	$ 1,020,585
Bob	$ 979,272
Sally	$ 951,054
Marcie	$ 909,460
Francine	$ 844,769
Victor	$ 826,891
Charlene	$ 630,871
Edward	$ 516,562
Harold	$ 398,478
Mike	$ 324,598
David	$ 130,049

INSTANT TEST Page 3-6

Using data you find in a publication of interest, enter at least ten rows of data with at least three columns into a spreadsheet.

(1)   Sort the entire table of data alphabetically by the leftmost column in ascending order and then in descending order.

(2) Practice sorting on other columns individually

(3) Practice sorting on two columns, then on three columns.

< statistics_text.docx >

3.5 Mistakes in Sorting

When working with these functions, highlighting all the data is essential. Leaving out a column from the sorted area and then sorting destroys the integrity of the data by mixing up parts of the observations.

For example, the European Spreadsheet Risks Interest Group (EuSpRiG) posted these reports from 2005 and 2006:

Aspiring Police Officers Say Exam Scores Were Botched (NBC13.com 8 Sep 2005)

"Some aspiring police officers who took a government exam said they were told they passed a big test, but found out later that they had actually failed. A national company called AON administered the test and told the board someone incorrectly sorted the results on a spreadsheet, so the names and scores were mismatched", NBC 13's Kathy Times reported.

"When they appealed, we went back to AON and asked them to check their scores, and when they audited, they discovered they made an error," said Bruce Nichols, of the Jefferson County Personnel Board. Nichols has resigned.

Price mixup mars opening of lot sales Venice, Florida, Jan 1, 2006

A snafu in the posting to the web site of minimum bid prices for the first phase of North Port's abandoned lot auction led to confusion as the cost of some lots seemingly tripled overnight. The appraiser hired by the county put the auction lot number, the property ID number and the minimum bid amount onto a spreadsheet in sequential order and, inadvertently, he did not sort the value column.[47]

INSTANT TEST Page 3-7

Using the multi-column data you created for the Instant Test on the previous page,

(1) Take a screenshot of your table and save the image as "properly_sorted" in whatever picture format you like (JPG, GIF, PNG….)

(2) Now deliberately highlight all but the rightmost column and sort using the leftmost column. Take a screenshot of that table and save it as "badly_sorted".

(3) Study the effect of the bad sort so that you remember the consequences of this kind of error and never do it again!

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[47] (EuSpRIG – European Spreadsheet Risks Interest Group 2012)

3.6   Making Backups of Your Work

As a routine precaution, EXCEL versions make AutoRecover backups every few minutes. If EXCEL crashes, you can restart and the latest autorecovery file will be opened and provide the latest status of the workbook.

It is also advisable to save the worksheet yourself before applying the sort for quick recovery after a serious error.

A good practice is to use version numbers (e.g., filename_v04.xlsx) and to increment the version number when starting to work again the next day on the file or before performing potentially dangerous operations.

For example, on starting to work in the morning with file filename_v04.xlsx, one could OPEN filename_v04.xlsx and immediately SAVE AS filename_v05.xlsx .

When you back up your work to an external medium (flash drive, USB or Firewire disk drive), you won't overwrite your only copy. For example, if you were to save your work as filename.xlsx before stopping work every day, your Tuesday evening backup would overwrite your Monday backup. If you made a terrible mistake on Tuesday, such as erasing an entire worksheet in your workbook, you would not be able to recover the deleted data. With filename_v04.xlsx on your external medium for Monday night and filename_v05.xlsx on Tuesday night, you could go back to filename_v04.xlsx and copy the data to paste into your damaged file.

Figure 3-12 below shows the first few lines of the listing of my own backup files for an earlier version of this textbook on a 1 TB external USB3 disk drive that I update from the C: drive every evening.[48]

Figure 3-12. Backup files with version numbers for statistics textbook.

Backup of statistics_text.wbk	2019-04-04 20:23
qm213_WEB_shortcut	2019-04-04 20:33
statistics_text.docx	2019-04-04 20:32
statistics_text_v0-23-2.docx	2018-03-19 07:52
statistics_text_v0-24-1.docx	2018-03-19 08:46
statistics_text_v0-25-1.docx	2019-02-08 09:40
statistics_text_v0-25-2.docx	2019-04-04 20:32

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[48] I tend to make more frequent version backups than once a day because I detest having to redo work if I have an accident.

For completeness, here's a snapshot from some years ago of some general backup files for my main tower system on the same external disk. The ZIPX files are generated using WinZip,[49] a popular and inexpensive file compression utility that has features such as jobs that can create multiple separate backups with a single click.[50]

Figure 3-13. General backups on external disk drive.
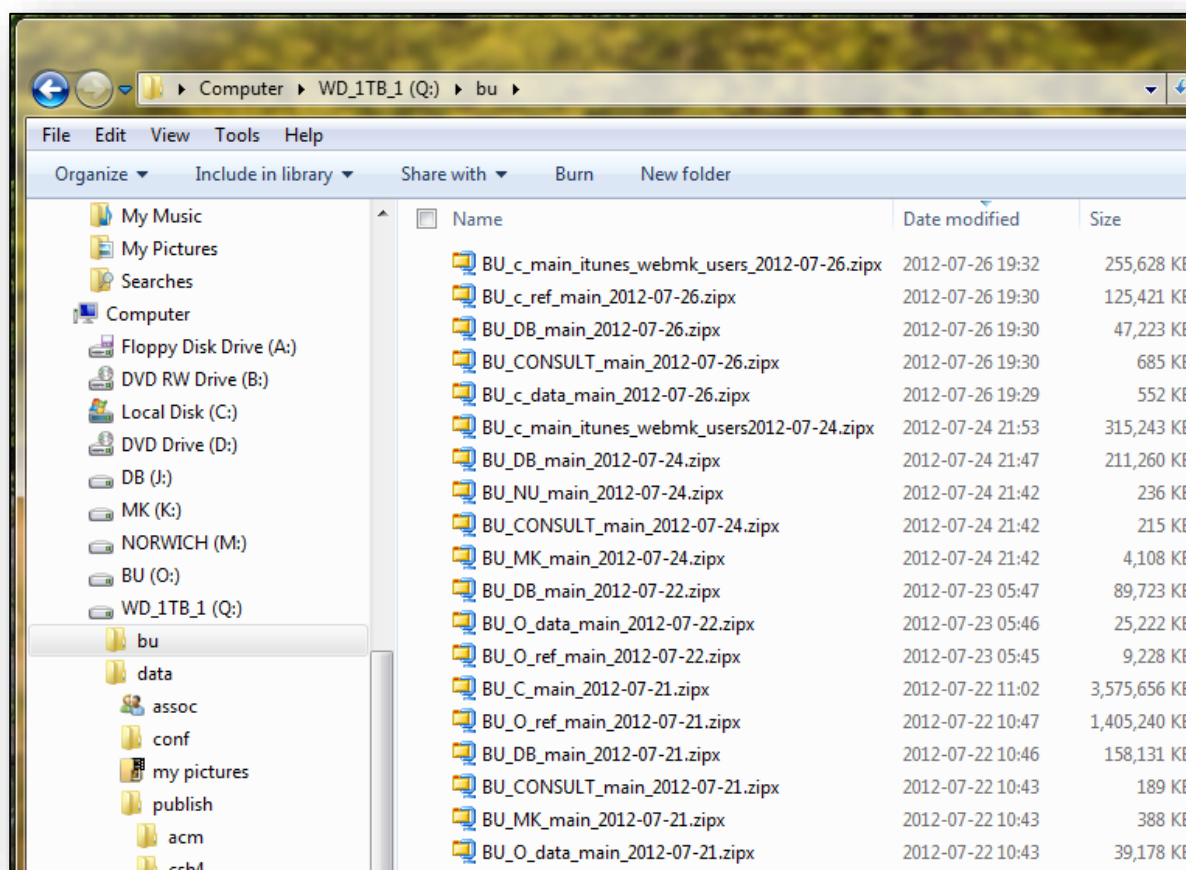
INSTANT TEST P 3-9

Practice creating versions of a file.

Open an Excel file and Save As < demo_v1.xlsx > and close that file. Open < demo_v1.xlsx > and make any change (add a random letter or number somewhere on a sheet). Save As < demo_v2.xlsx > and exit. Sort your file list by date with the newest files at the top. Look at the time stamp of the two versions you just created. Open the latest file and save it with an incremented version number. Remember this process when you work on your homework. And don't expect much sympathy from your instructor if you claim that the computer ate your homework files.

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[49] http://www.winzip.com/win/en/index.htm
[50] For more guidance on how to use folders and backups, see "Organizing and Safeguarding Information on Disk."
http://www.mekabay.com/methodology/osiod.pdf

3.7   Enhancing the Presentation of Tables

Both WORD and EXCEL offer extensive options for creating and formatting tables. Such tables are used in business, engineering, and science to summarize information; enhancing the tables using borders, colors, and title rows helps the reader understand the information quickly and correctly.

3.8   WORD Table Tools

WORD offers easy methods for creating small, simple tables without calculations. WORD 2007, for example, has a drop-down menu in the Insert tab that allows one to create a blank table form of a particular number of rows and columns using one's cursor to highlight the right shape and then lets one fill in data and format the table (see Figure 3-15).
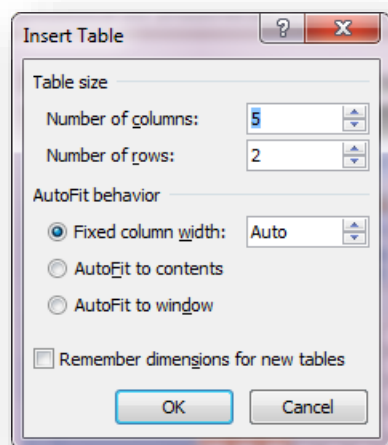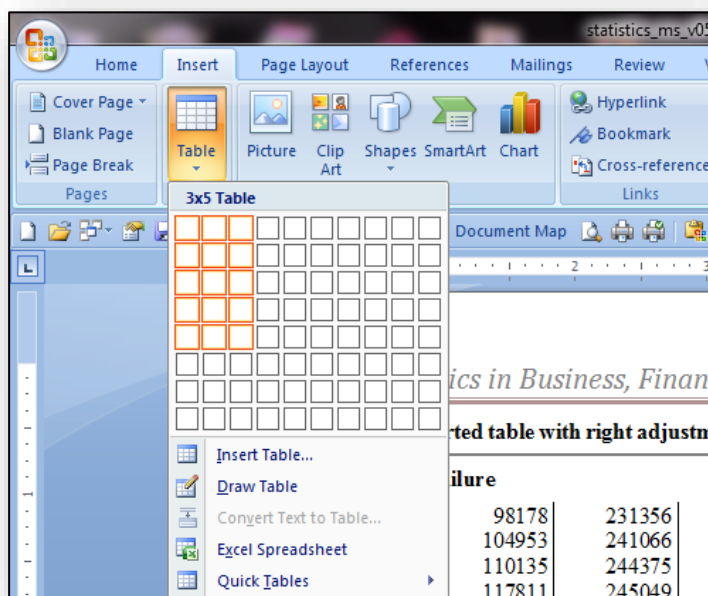
Figure 3-15. Creating a new blank table in Word.

Figure 3-14. Insert Table pop-up menu in Word.

Other options shown in the menu in Figure 3-15 include the Insert Table function, which allows one to specify the number of rows and columns by entering those values into a form (shown in Figure 3-14).

Other functions in WORD include creating a table (Convert Text to Table) from a series of entries separated by the TAB character (the Tab key or ^t when inserting the character using the search-and-replace function)[51] and creating an EXCEL spreadsheet directly in the WORD document without having to load EXCEL manually. Finally, the Quick Tables options offer a wide range of pre- formatted tables including calendars, double tables (splitting a table into two halves that appear side by side) and matrices (same categories on the top row and the left column).

[51] The quickest way to access the search-and-replace menu is to use the key combination CTL-H.

One can also save one's own customized table formats as "quick tables" in this gallery (last entry on the menu) by highlighting the desired table one has created and giving it a name.

Figure 3-16. Quick Tables in Excel.
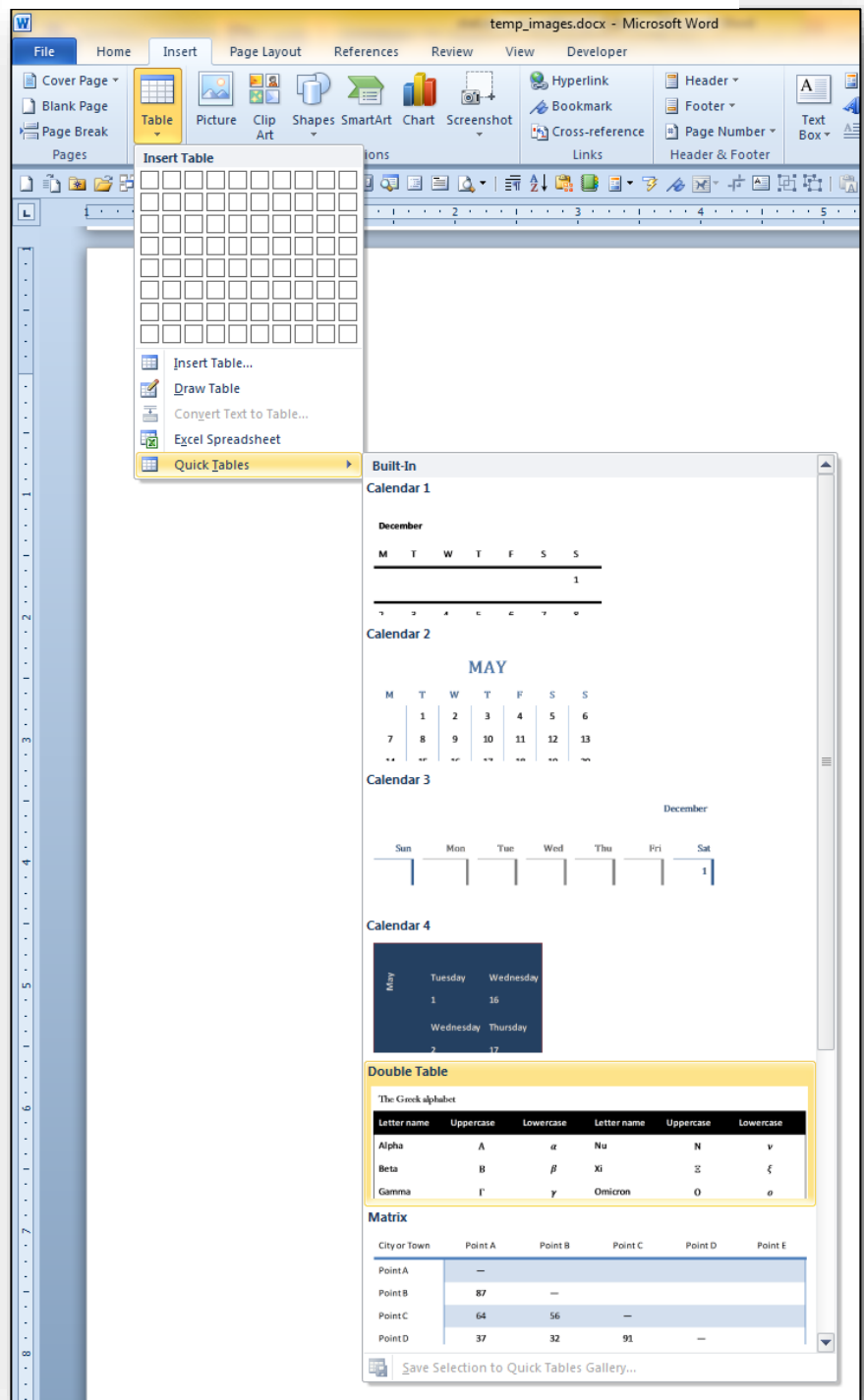
A particularly important set of tools in WORD is activated by right-clicking on an entire table using the four-arrow symbol in the left upper corner of the table as shown below in Figure 3-17.

**Figure 3-17. Highlighting an entire table in Word.**
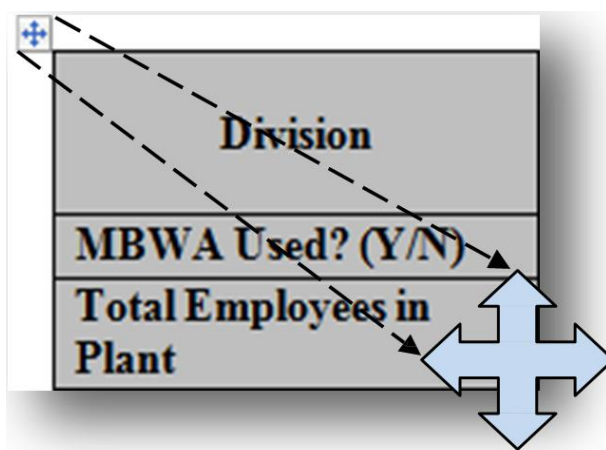
Highlighting the table, one or more rows or columns or a specific cell allows one to right-click for a formatting menu that includes **Borders and Shading** and **Cell Alignment** (illustrated in Figure 3-18). One can apply colors, shift the position of text left or right and up or down, and add colored borders to cells, rows, columns, or the entire table.

Figure 3-18. Right-click pop-up menu for adjusting formatting in Word table.

< statistics_text.docx >
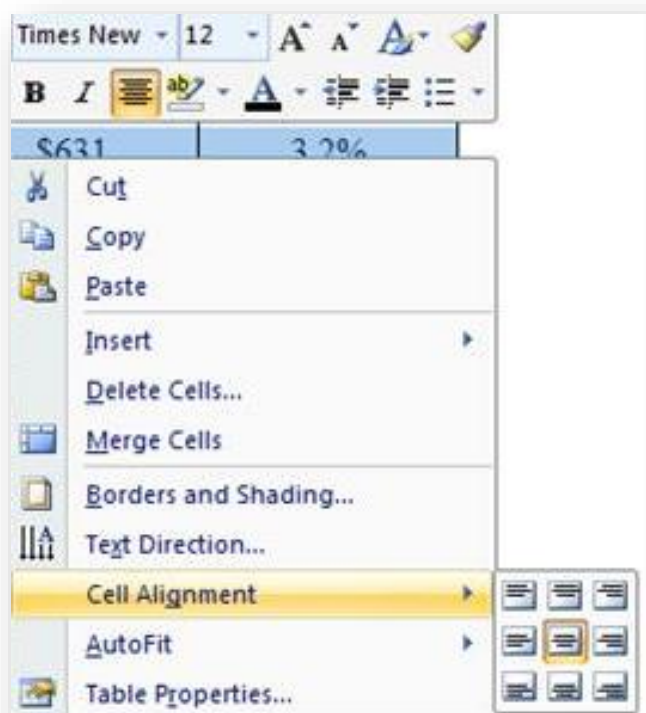
A useful option in **Table Properties** (the last option in Figure 3-18) for large tables is in the row option for the top rows that force the selected row(s) to be repeated at the top of every new page (see Figure 3-19) if the table is broken automatically into parts to fit the space available.

Figure 3-19. Table Properties menu showing header-row definition.
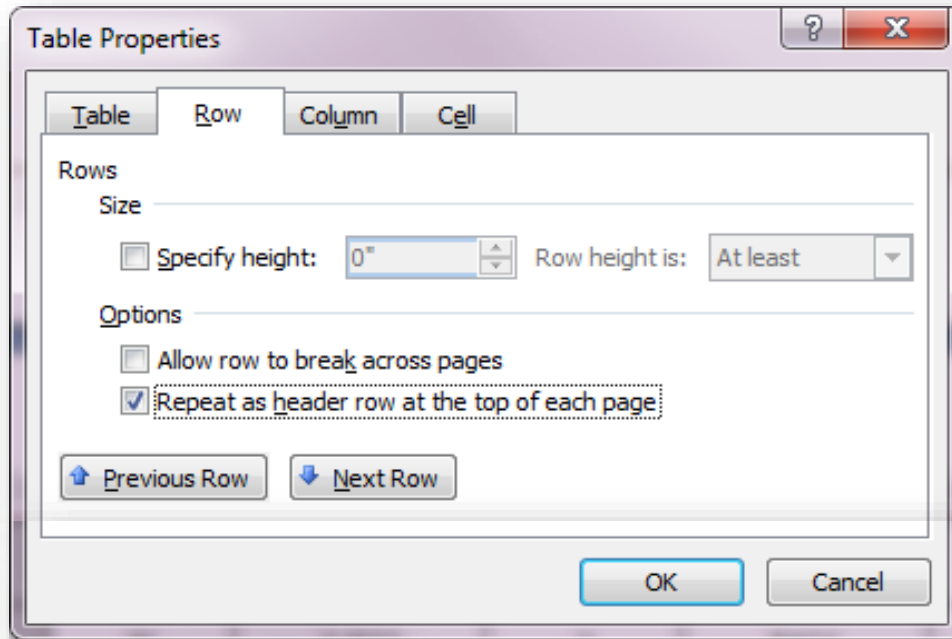
INSTANT TEST P 3-14

Practice creating a reasonably extensive table in Word – you may be able to use data from one of the Web sites you visited or material from a previous exercise. Even just half-a-dozen rows with three or four columns will do for the demonstration. Include a heading row on your table that labels the columns.

Move the table toward the bottom of a page in a Word document by inserting several Enter strokes before it and observe the data flowing automatically onto the next page. Unless you have already set the Table Properties to define the header, the data will not be labeled on the second page.

Now delete some empty lines before the table to bring it back and highlight the top row. Use the Table Options discussed in this section to force that top row to be used as a header on the next page if the table splits across a page-break.

Try the same process of pushing the table over the bottom of your page and note the difference in appearance of the second page when there's a heading row on every page.

Be suitably impressed by your new-found abilities and give yourself a pat on the back.

If you *really* want to pick up hot dates at a bar,* learn to control whether a row transfers as a whole or slips across the page break line by line. Hint: use paragraph formatting. [*joke*]

3.9 EXCEL Table Tools

EXCEL offers a much wider range of predefined table formats than WORD. One can do all the formatting oneself or use the Format as Table menu to choose among some popular color and emphasis layouts. A handy feature is that hovering the cursor over a style shows one the appearance of the selected table (see Figure 3-20). Notice that the selected format (row 4, column 4 in the choices shown) was applied temporarily to the table in columns I, J and K to illustrate its effect.

Figure 3-20. Trying out different table styles using Format as Table options.
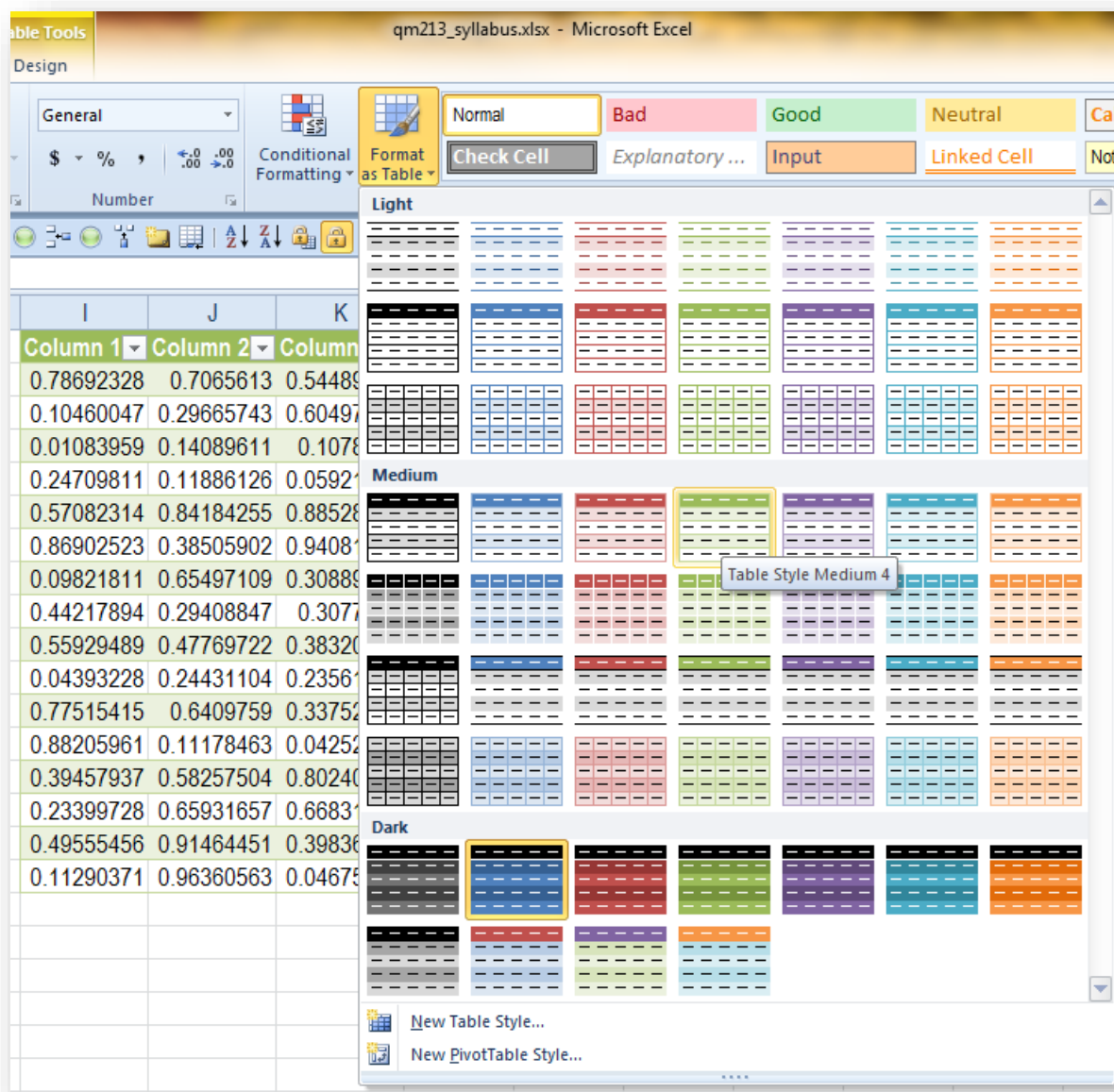
INSTANT TEST P 3-15

Create a simple table in Excel and experiment by hovering your cursor over a variety of styles to see their effects. Click on one and then change it to another, and another, and another to get used the process.

< *statistics_text.docx* >

3.10 Copying EXCEL Tables into a WORD Document

When copying an EXCEL table into a WORD document, there are several options. Figure 3-21 shows a sample table in EXCEL.

Figure 3-21. Sample Excel table for pasting into Word.

	A	B	C	D
1	**Trans-Stellar Force**	**Sophonts**	**Starships**	**Weapons-class**
2	Beth'dxomth'o	1,266,082	45,430	B
3	Cyphlonia	1,414,427	71,472	A
4	Mars	1,047,074	19,385	C
5	Raturto	981,772	63,954	A
6	Terra	860,295	4,977	B
7	Vakooli	377,009	61,488	D

Simply Copying/Pasting (e.g., with CTL-C CTL-V or by using the Copy and Paste functions in the right-click menus) presents a menu for choosing how to paste the table (Figure 3-22) and also previews the appearance:

Figure 3-22. Paste menu.
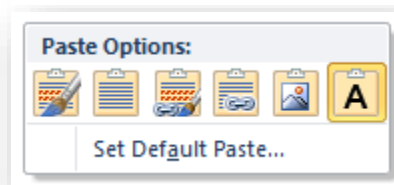
The leftmost option, Keep Source Formatting (K), pastes the EXCEL data as a table using the table formatting (e.g., column widths, emphasis such as bold) from the EXCEL source file into the WORD document. The K is the shortcut keystroke to select that option (instead of clicking on the icon). Figure 3-23 shows the preview:

Figure 3-23. Using the "Keep Source Formatting" option to paste Excel table into Word.

Trans-Stellar Force	Sophonts	Starships	Weapons-class
Beth'dxomth'o	1,266,082	45,430	B
Cyphlonia	1,414,427	71,472	A
Mars	1,047,074	19,385	C
Raturto	981,772		
Terra	860,295		
Vakooli	377,009	61,488	D

Paste Options:

Keep Source Formatting (K)

Using the second icon from the left, Use Destination Styles (S), puts the contents of the table into the document as a simple WORD table using whatever your defaults are for WORD tables (Figure 3-24):

Figure 3-24. Using the Destination Styles option to paste an Excel table into Word.

Trans-Stellar Force	Sophonts	Starships	Weapons-class
Beth'dxomth'o	1,266,082	45,430	B
Cyphlonia	1,414,427	71,472	A
Mars	1,047,074	19,385	C
Raturto	981,772		
Terra	860,295		
Vakooli	377,009	61,488	D

The middle icons, Link & Keep Source Formatting (F) (Figure 3-25) and Link & Use Destination Styles (L) (Figure 3-26) bind your original EXCEL file to your WORD document.

Figure 3-25. Pasting an Excel table into Word as a link using the source formatting.
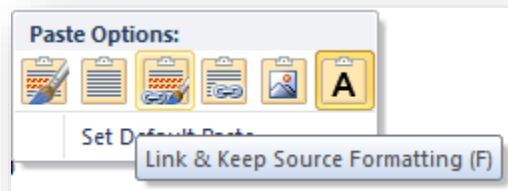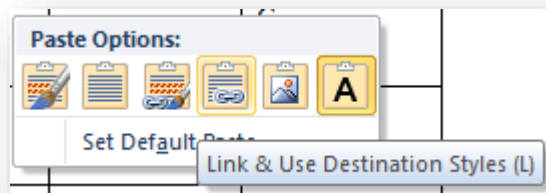
Figure 3-26. Pasting an Excel table into Word as a link using the destination styles.
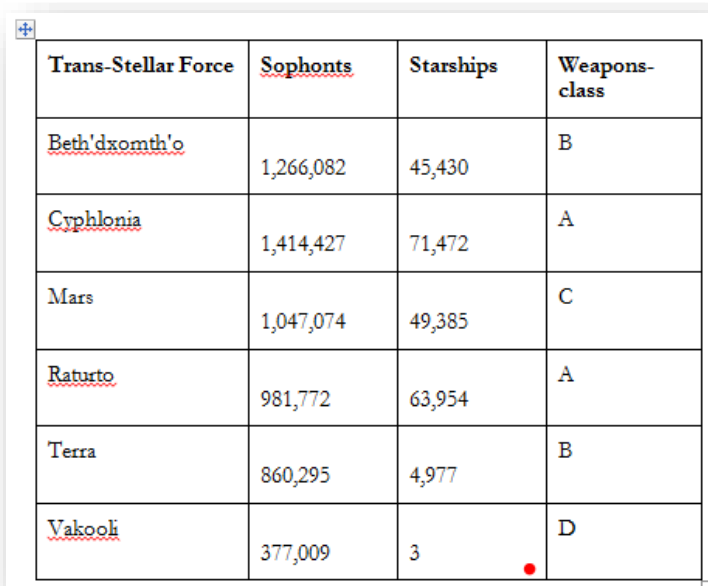
All numerical changes in the EXCEL source file are instantly reflected in the formatted view in your WORD document. The implication: you must keep track of both your EXCEL and your WORD files so that they never go out of synchronization (*synch*). If the EXCEL source file is moved from its original place into another folder or renamed, the table in WORD will disappear and any cross reference to it will show a highlighted message reading "**Error! Reference source not found.**" in the text.[52]

Linked tables are ideal for periodic reports that show the current data every time you open them. Links to graphs (discussed later) do the same: whenever the source graph in the EXCEL file changes, the WORD report shows the modified graph the next time the WORD file is opened. All linkages also mean that mistakes can be propagated automatically from the EXCEL spreadsheet into all documents using the linkages.

For example, here (Figure 3-27) is the image of a dynamically linked table (using destination styles) in which the user has accidentally modified the last cell in the "Starships" column to the erroneous value "3" (red dot added to the image to identify the cell):

Figure 3-27. Dynamically linked table showing error propagating from Excel to Word.

Trans-Stellar Force	Sophonts	Starships	Weapons-class
Beth'dxomth'o	1,266,082	45,430	B
Cyphlonia	1,414,427	71,472	A
Mars	1,047,074	49,385	C
Raturto	981,772	63,954	A
Terra	860,295	4,977	B
Vakooli	377,009	3	D

INSTANT TEST P 3-18

Create a simple numerical table in Excel. Paste it into a Word document using the Link & Use Source Formatting option. Then do the same on another page of the same document using the Link & Use Destination Styles option. Compare the effects.

Now go back to your Excel source file and alter some of the numbers – and highlight them as colored text.

Go back to your Word document and see the effects on what's visible there.

---

[52] To be sure everyone is clear on this, the "Error!..." string in the indicated line on this page does *not* indicate an error in *this* page of the text: it's the text of the error message for illustration only. If you find such a warning elsewhere, let the instructor know.

The second option from the right in the **Paste Options** menu is **Picture (U)**. This option (Figure 3-28) pastes an image of the EXCEL table into your document using your default preference for the type of image to use.

If you want more options for pasting images of an EXCEL table, use Ctrl-Alt-V to bring up more choices, as shown in the **Paste Special** menu in Figure 3-29:

`

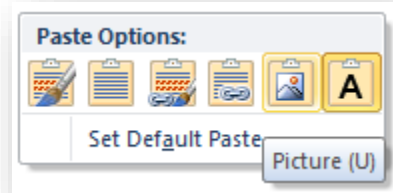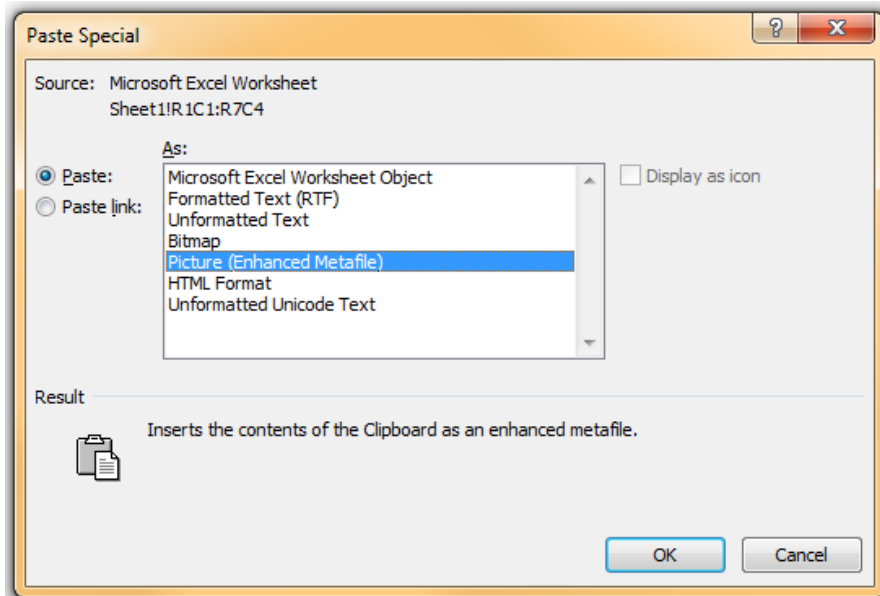**Figure 3-28. Pasting an Excel table as a picture into Word.**

Figure 3-29. Paste Special options.

Picture (Enhanced Metafile) and Bitmap both insert an exact image of what was in the EXCEL file, including the cell boundaries if they are visible in EXCEL. Bitmaps are much larger than enhanced metafiles, as you can see in the file listing in Figure 3-30:

Figure 3-30. Comparing bitmap and enhanced metafile file sizes.

blank.docx	18 KB
blank_with_bitmap.docx	267 KB
blank_with_enhanced_metafile.docx	24 KB

INSTANT TEST P 3-19

Experiment with pasting different versions of an Excel table using the Paste Special menu. Try pasting the tables into a document with text you've already written to see the consequences for that text. **Remember to save your file as TEMP before you do any experimenting!**