Advanced Excel Handout
Data & Donuts Workshop Series

Tips for Using Excel Productively

Navigation

Freeze Panes
To keep headings visible while scrolling. Go to menu: View > Freeze Panes > Freeze Top Row (to lock first row) or position active cell where you wish the lock to occur and then select View > Freeze Panes > Freeze Panes (applies above and to the left of current cell).
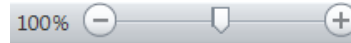
Keyboard Shortcuts

Arrow keys	Move one cell left, right, up or down
Ctrl + Arrow keys	Move to the edge of data range in worksheet
Ctrl + End	Move to the last cell on a worksheet; the lowest used row of the rightmost used column
Ctrl + Home	Move to beginning of a worksheet. Home move to first cell in row.
Ctrl + Shift + End	Extend the selection of cells to the last used cell on the worksheet (lower-right corner).
Ctrl + Spacebar	Select entire column
Shift + Spacebar	Select entire row
Shift + Ctrl + F8	Select Multiple Areas
Ctrl + A	Selects the entire data range in worksheet
Ctrl + PgUp /PgDn	Move between sheets in a single workbook
Esc	Cancel current action
F2	Edit selected cell
F4	Cycle through all combinations of absolute and relative references in a formula for a cell reference or range.
F5	Go to a specific cell. For example, C6.
F7	Spell check selected text or document.
Ribbon keyboard shortcuts	Press and hold ALT key to show small letter by each tab in ribbon, then press letter or number to open specific tab or menu

For more, see Excel keyboard shortcuts and function keys for Windows. https://support.office.com/en-us/article/Excel-keyboard-shortcuts-and-function-keys-for-Windows-1798d9d5-842a-42b8-9c99-9b7213f0040f (http://tinyurl.com/h6dwkla).

View/Zoom Slider

Located at bottom right of window

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Status Bar Quick Calculations
Use status bar (located at bottom right of workbook) to display key metrics about the range of data selected. Options: sum, min, max, average.

Color Code Sheet Tab
1) Right click on the tab of the worksheet you want to re-color.
2) Select Tab Color from popup menu;
3) Click on a color to select it;
4) Click on More Colors at the bottom of the color palette to open the custom color palette. Also, accessible from the Home > Cells > Format button.

Auto Fill
Select cell with content to copy/paste.
Fill handle appears as a small solid square in the bottom-right corner of the selected cell(s).
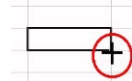
Hover mouse over Fill Handle till turns to a black cross. Then Double Click to copy values down adjacent cells.

Go to feature
Use the Go to feature (Ctrl + G) to find things in big ranges of data, for example finding blank cells that are missing data, which you need to fill in. Or familiarizing yourself with a worksheet, such as highlighting cells containing formulas.

1) Highlight your range.
2) Go to menu: Edit > Find > Go To…
3) Click Special.
4) Then select Blanks, Formulas, etc.

Copy / Paste special options
To use Special paste options (such as Values only, No formulas, skip blank cells or transpose data) first copy data range, then press Ctrl+Alt+V to display the Paste Special dialog box. (Select Transpose option to change data from row to columns orientation and vise versa.)

Tips for Managing Your Data using Excel

Best practices

Use in conjunction with a "Data Dictionary"
Keep track of changes made to your worksheet
Back up data periodically or before any major change
Use descriptive filenames

Data entry guidelines:
- Place variable names in first row
- Use unique identifier per entity
- Format columns to match variable type (date, numeric, text, etc.)
- Enter string variables in a consistent case
- Do not leave any blank rows in the date range

Export Data
- Save each sheet as separate file
- Get rid of formulas – Use Copy > Paste special > Values only
- Save as csv format; Encode UTF-8 character set

See "How to save CSV file as UTF-8 in Microsoft Excel?" https://www.xadapter.com/how-to-save-csv-excel-file-as-utf-8-encoded/#save-csv-microsoft-excel (http://tinyurl.com/ycfg9rae).

Sources:
Elliott, A C. (2006). Preparing data for analysis using Microsoft Excel. Journal of investigative medicine, 54(06), 334-341.

Hook, Les A., et al. 2010. Best Practices for Preparing Environmental Data Sets to Share and Archive. Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/BestPractices-2010 (http://daac.ornl.gov/PI/BestPractices-2010.pdf)

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Advanced filtering

Select any cell in header row. Then go to menu: Home > Editing > Sort & Filters > Filter (Control + Shift + L).

In addition to key word search and a complete listing of values found in each column, Excel provides special filter options based on field type. For example, Date filters will provide options such as before or after a date, by period such as month, quarter, year, etc.; Number filters options include Top Ten values or above/below average.

Data Lists

Use Excel Data Lists for easy data entry. To apply, go to menu: Home> Styles > Format as table (press Alt+HT). Click Yes, then select formatting style from gallery thumbnails.

Excel will automatically:
- Apply Filters to the data range.
- If add a column with a new formula, will automatically copied down for all rows.
- Use tab key to automatically go to a new row for quick data entry.

To convert table back to normal cell range, first click on any cell in data table, then go to menu: Table Tools > Design Tab> Tools >Convert to Range button. Then click Yes to convert. To remove residual formatting, select data range, Home > Font > Fill button > No Fill.

Get External Data

Import Text Files

Text or Flat files contain only data, no formulas or formatting. To import, go to menu: Data > Get External Data > From Text. Double-click the text file that you wish to import in the Import Text File dialogue box. Then click Import. This will pull up the Text Import Wizard ...

Text to columns

To split data into multiple columns either by character (comma, tab, space, etc.) or by fixed width.

Go to menu: Data > Data Tools >Text to Columns. This starts the Convert Text to Columns Wizard. In step 1: Click Delimited or select Fixed Width option; In Step 2) Enter character to split text or manually parse text; In Step 3) Optional. Here can select destination cell or exclude columns to split. Also configure field types (text, dates, etc.) Tip: Use Data Preview Window to verify results.

For screen shots see "Split text into different columns with the Convert Text to Columns Wizard" https://support.office.com/en-us/article/Split-text-into-different-columns-with-the-Convert-Text-to-Columns-Wizard-30B14928-5550-41F5-97CA-7A3E9C363ED7 (https://tinyurl.com/y6vgd6nx).

Web Query

To import data from a website into your worksheet, go to menu: Data tab> external queries > from web> paste URL> Press GO. In the Web Query dialog box, select table from webpage to import by clicking on yellow arrow. When this arrow turns blue, click Import.

Datasets for Teaching and Learning. For list of freely available datasets, see http://libguides.rice.edu/data_resources/samples

Advanced Functions

VLOOKUP
To pull specific data from a separate table. When using a VLOOKUP, you define a value (lookup_value) and the formula looks for it in the leftmost column of a table (table_array).

SYNTAX: VLOOKUP(lookup_value, table_array, col_index_num, range_lookup)

lookup_value	WHAT -- The value that you want to search for.
table_array	WHERE -- The range of data that is to be searched for the lookup_value. Note: The Vlookup function searches in the left-most column of this array.
col_index_num	WHICH COLUMN -- the column number of the supplied table_array, that you want to return a value from.
range_lookup	OPTIONAL. For exact match use FALSE, for first closest match use TRUE. If left blank, excel defaults to TRUE.

CRITERIA BASED CALCULATIONS
Use functions **SUMIF/S, AVERAGEIF/S and COUNTIF/S** to return a sum, average or count of values that meet some specified criteria. NOTE: Can use the wildcard characters—the question mark (**?**) and asterisk (*****)—as part of the *criteria* argument. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (**~**) preceding the character.

APPEND AND SEARCH FUNCTIONS
CONCATENATE–To join two or more values into one string. Joined values can be text, numbers or cell references.
SEARCH– returns the location of a substring within a cell.
FIND–Same as SEARCH but case sensitive.

DATA MANIPULATION FUNCTIONS
CLEAN–Removes all nonprintable characters from text (e.g. hard line breaks, Tabs, null characters)
TRIM– Removes extra white spaces from text sting, leaving one space between words
TEXT–Formats a number and converts it to text (such converting long date values)
UPPER, LOWER, PROPER–Convert case
LEFT, RIGHT–Extract text strings

For specific examples and syntax see: Excel functions (by category) at https://support.office.com/en-us/article/Excel-functions-by-category-5f91f4e9-7b42-46d2-9bd1-63f26a86c0eb (http://tinyurl.com/zvpkuub).

Conditional formatting

Apply cell formatting to visualize trends, spot unusual values or provide instant analysis.

Steps:
1) Select range to apply formatting
2) Go to menu: Home > Styles > Conditional Formatting
3) Select a rule or formatting style from many available options
   a. Basic rules : highlight cells based on criteria such as greater than/less, top/bottom values, text, dates, and even for duplicate values.
   b. Graphical forms : defined styles—or presets. Data Bars, Color Scales and Icon Sets show a range between the highest, lowest, and mid-range values. Automatically formatted between three to five levels.
   c. Other options : Create custom rules or edit rules (manage) and clear conditional formatting

See more at: Excel 2016: Conditional Formatting. https://www.gcflearnfree.org/excel2016/conditional-formatting/1/ (http://tinyurl.com/yd929vhu).

Advanced Pivot Tables Tips

Need a refresher on basic Pivot Tables? See "Create a PivotTable to analyze worksheet data" at https://support.office.com/en-us/article/Create-a-PivotTable-to-analyze-worksheet-data-a9a84538-bfe9-40a9-a8e9-f99134456576?ui=en-US&rs=en-US&ad=US (https://tinyurl.com/y7sew8j3)

Recommended PivotTables
Provides suggested Pivot Tables configurations. This feature gives a quick starting point which you can continue to adjust.

Steps:
1) Place cell pointer in any cell of data list
2) Go to Insert tab > Tables > Recommended button
3) Select one of the thumbnails in the preview window
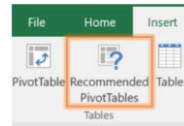
Tabular View
Go to menu: Pivot Table Tools> Design Reports Layout > Show in tabular form. Instead of the default view provides a more spreadsheet style layout, which is easier to apply formulas or to copy and paste data.

Calculated Fields
Used to insert custom formulas to your report. Calculate fields are computed by a formula using existing numeric fields found in the data source.

Steps:
1) Click on any cell in the Pivot Table
2) Go to menu: Pivot Table Tools > Analyze > Calculations > Field, items & sets Button
3) Selection Insert Calculated field
4) In dialog box, Enter Name for new field
5) In formula box, delete zero after equal sign and click on field to base to use in formula and then enter formula using any arithmetic operator (+, - , * or /). For example: Taxes = Revenue *.15.
6) Press OK to insert calculated field
   Note: The new Calculated field will appear in Task Pane. Calculated fields can be toggled on and off like any other field from the task panel.

Changing a calculation function
Use alternative calculation for default value. For example: Add percentage instead of sum for a field (e.g. revenues).
- Add 2nd copy of field to Values section of the Task Pane.
- Right click on cell in pivot table report
- Select Show Values as > % of Grand Total

Other tips:
- Remember to "Refresh" pivot table when adding content to data source (Right click over table and select "refresh" or Go to Pivot Table Options > Change data source and update range manually).
- To view details that make up a subtotal double click on cell. This creates a new table showing details (i.e. complete rows) making up the subtotal.
- Change default header names:
  o Double Click on label and type in updated text
  o Turn off field headers (Pivot Table > Options > Show > Field Headers)
  o Switch report layout (Pivot Table > Design > select Outline or Tabular layout.
- Retain any formatting by using Value Field Settings (otherwise formatting may disappear upon refresh or change)