

Excel @ Excel

Data for tonight - <http://tinyurl.com/GA-ExcelatExcel>



Let's get some sample data to play with

Public Space Permits Last 30 days

<http://tinyurl.com/GA-ExcelatExcel>

Original Data Source:

<http://opendata.dc.gov/>

Hi!
My name is
Carey Anne



By the end of this course...

Average Joe



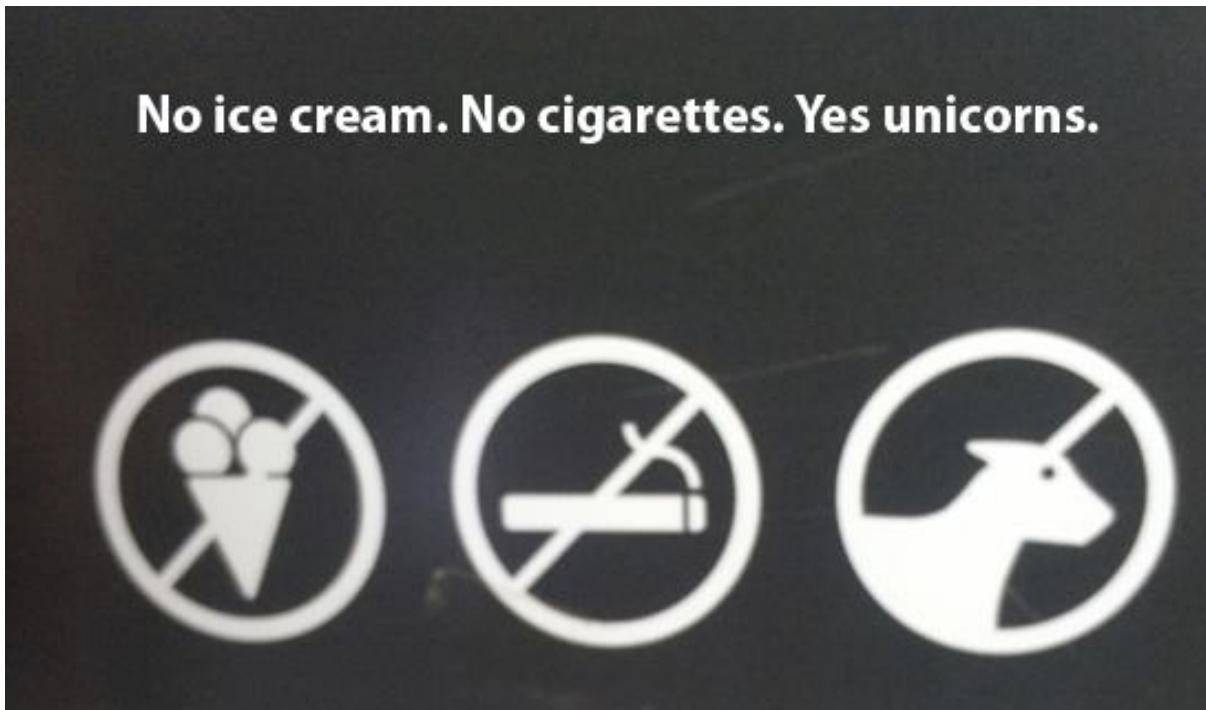
- ✓ Get started
- ✓ Navigate
- ✓ Format
- ✓ Print
- ✓ Calculate
- ✓ Chart
- ✓ Cheat

WIZARD OF
EXCEL



Image credit: sprout labs, Jonathan s3aphotography & mac_filko

How we're learning



Try practicing
this content

I have an
example
from my
work!

Shortcut

Edit the active cell

F2

^ U

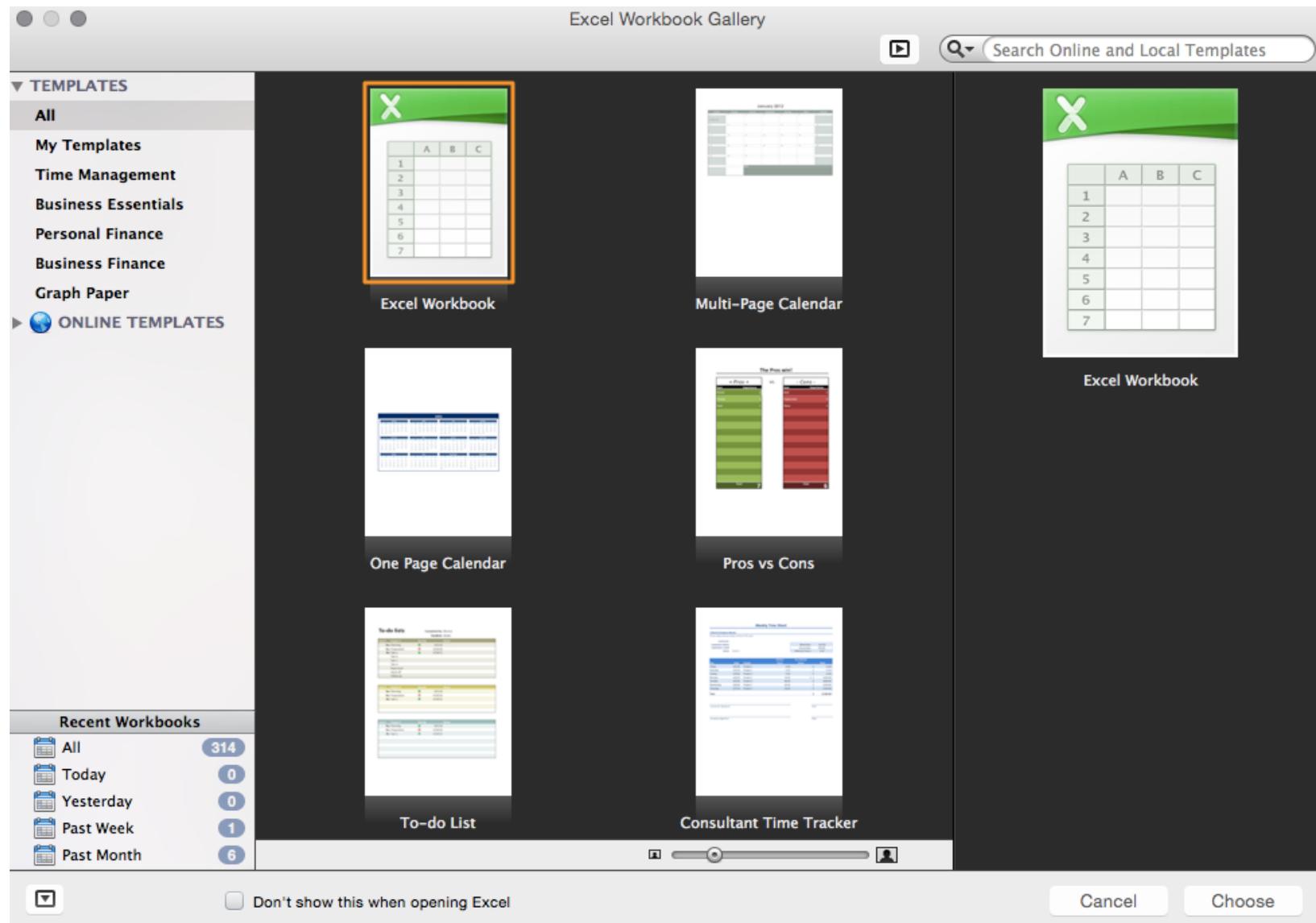
Note that ^ on a MAC is the 'Control' Button

GET STARTED

- ✓ Open Excel
- ✓ Use vocabulary
- ✓ Find cells

Step 1. Open Excel

Use templates or start from scratch

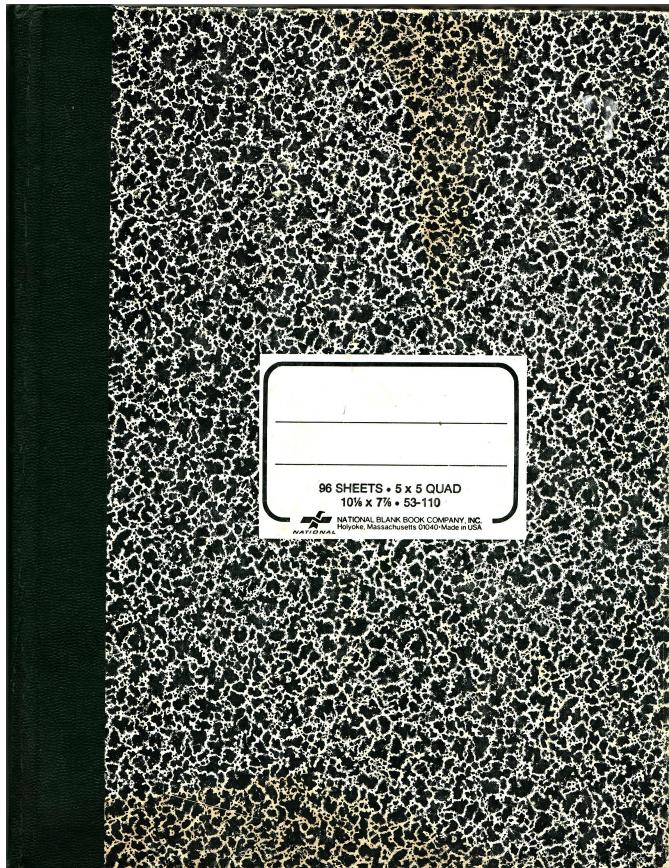


Vocab 101

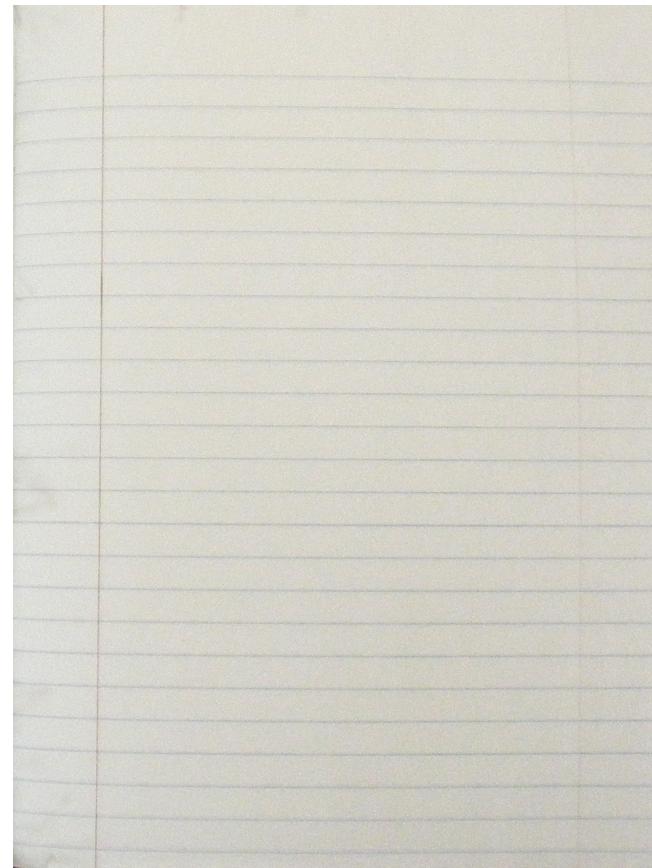
Workbook
“File”

A screenshot of a Microsoft Excel application window. The ribbon at the top includes tabs for Home, Layout, Tables, Charts, SmartArt, Formulas, Data, and Review. The Home tab is selected. Below the ribbon is the formula bar with the text 'fx' and a dropdown arrow. The main area shows a blank worksheet grid from A1 to S15. Cell I5 is currently selected, indicated by a green border. A green circle highlights the 'Workbook3' tab in the ribbon's tabs section. Another green circle highlights the 'Sheet1' tab in the bottom-left corner of the window.

Getting names straight



Workbook
“File”



Worksheet
“Spreadsheet”

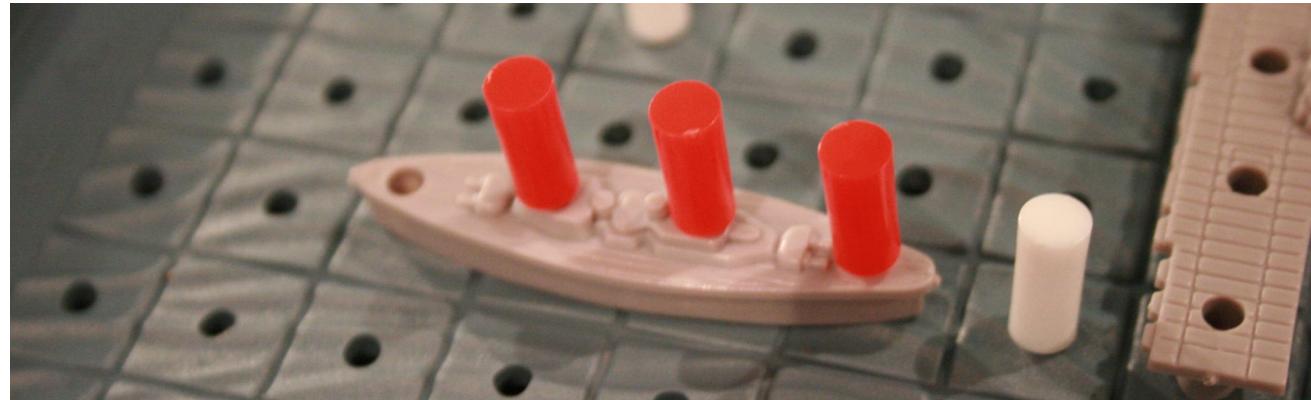


Prince

Image Credit: Calsidyrose & Rita Hutcheson Cobbs

Dude, where's my cell?

A screenshot of Microsoft Excel illustrating the concepts of rows, columns, and cells. The spreadsheet shows a 2x2 grid of cells. The first cell (A5) contains the text "Cell". The second cell (B5) contains the text "Column / Field / Attribute" and is highlighted with a green background. The third cell (A6) is empty. The fourth cell (B6) is also empty. The Excel ribbon is visible at the top, showing tabs like Home, Layout, Tables, Charts, SmartArt, Formulas, Data, and Review. The formula bar shows "I5". The status bar at the bottom indicates "Normal View" and "Ready".



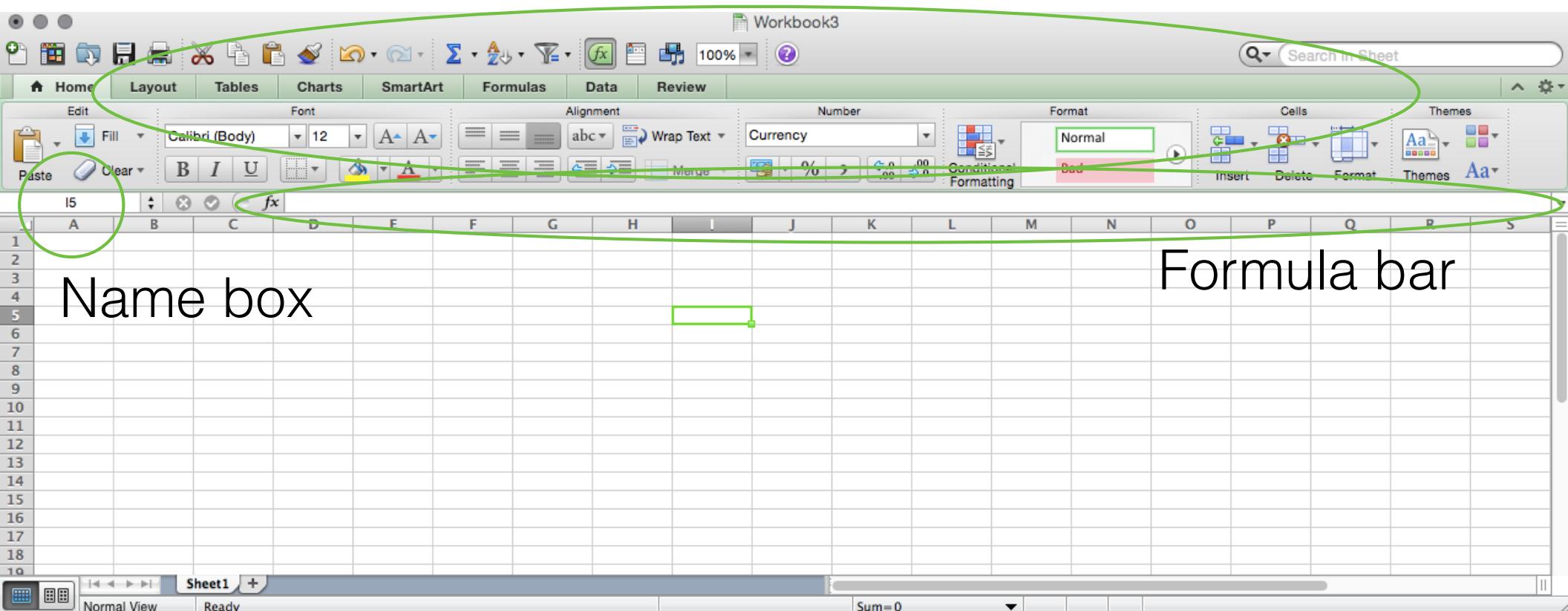
Battleship Bingo

Hit or Miss?

A	B	C	D	
1				C2
2	HIT!	HIT!	HIT!	C3
3		MISS!		D2
4	MISS!			A4
				B2

Vocab 102

Ribbon



BEST PRACTICES

Excel worksheet management

- Create folder structure for project organization
- Keep an untouched copy of raw data
- Consider creating an ID column to keep a record of the original order of data
- Change formulas to values once you've used them...
- ...but keep a copy of them in your sheet for reference
- Document the steps you take in your analysis
- Create a summary sheet up front - directory of other sheets, explanation of analysis, short summary of results

Why be so meticulous at this step?

- Things go wrong, you may need to start over
- You may need to go back and replicate your work later
- You may leave and your workbook must stand the test of time
- Cover yourself by maintaining a robust audit trail where every number in your deliverables is accounted for

NAVIGATE

- ✓ Move around
- ✓ Erase mistakes
- ✓ Create content
- ✓ Move stuff
- ✓ Get fancy
- ✓ Teleport
- ✓ Print

Move from one cell to another

Point & Click

Use arrows

Select cells

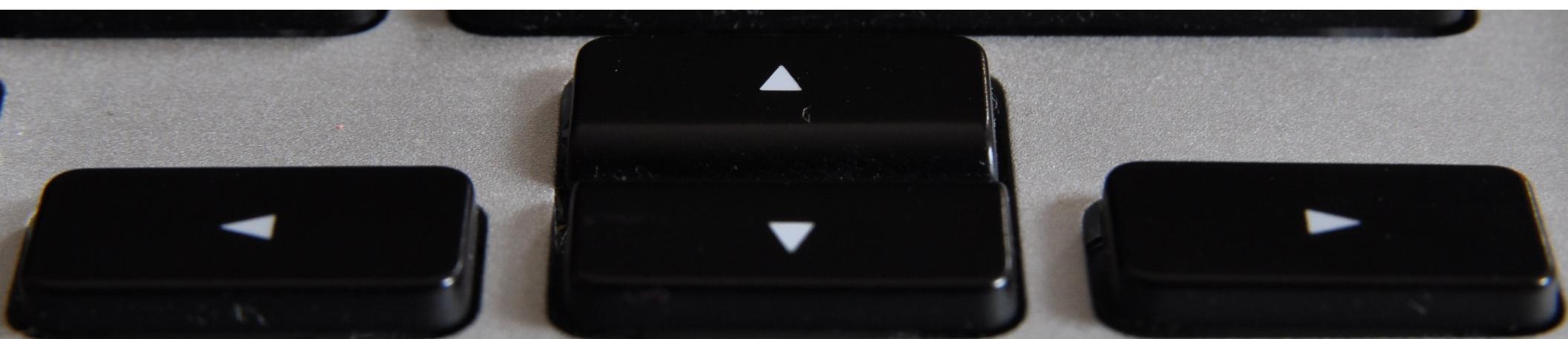
Click and drag

	A	B
1		
2		
3		
4		
5		
6		
7		

Select an entire row or column

Click Number or Letter

Click & Drag



Use the ribbon



Filter
Sort
Sum
Redo
Undo
Copy format
Copy
Cut
Print
Save
Open
Gallery
New document

View menu
Right click

Cut ⌘X
Copy ⌘C
Paste ⌘V
Paste Special... ⌘⌘V

Look Up ►
Translate...

Insert...
Delete...
Clear Contents
Filter ►
Sort ►

Insert Function...

Insert Comment
Delete Comment
Format Cells... ⌘1
Pick From List...
Hyperlink... ⌘K

Insert Page Break
Reset All Page Breaks



Image credit: Chris JL Pointing Fingers

Try this: In cell A1, delete title and rename it “X”

Enter/edit text

Point & double click
Use formula bar

Overwrite cell contents

Point & click
Highlight formula bar

Delete cell contents

Click & delete

Edit the active cell

F2

^ U

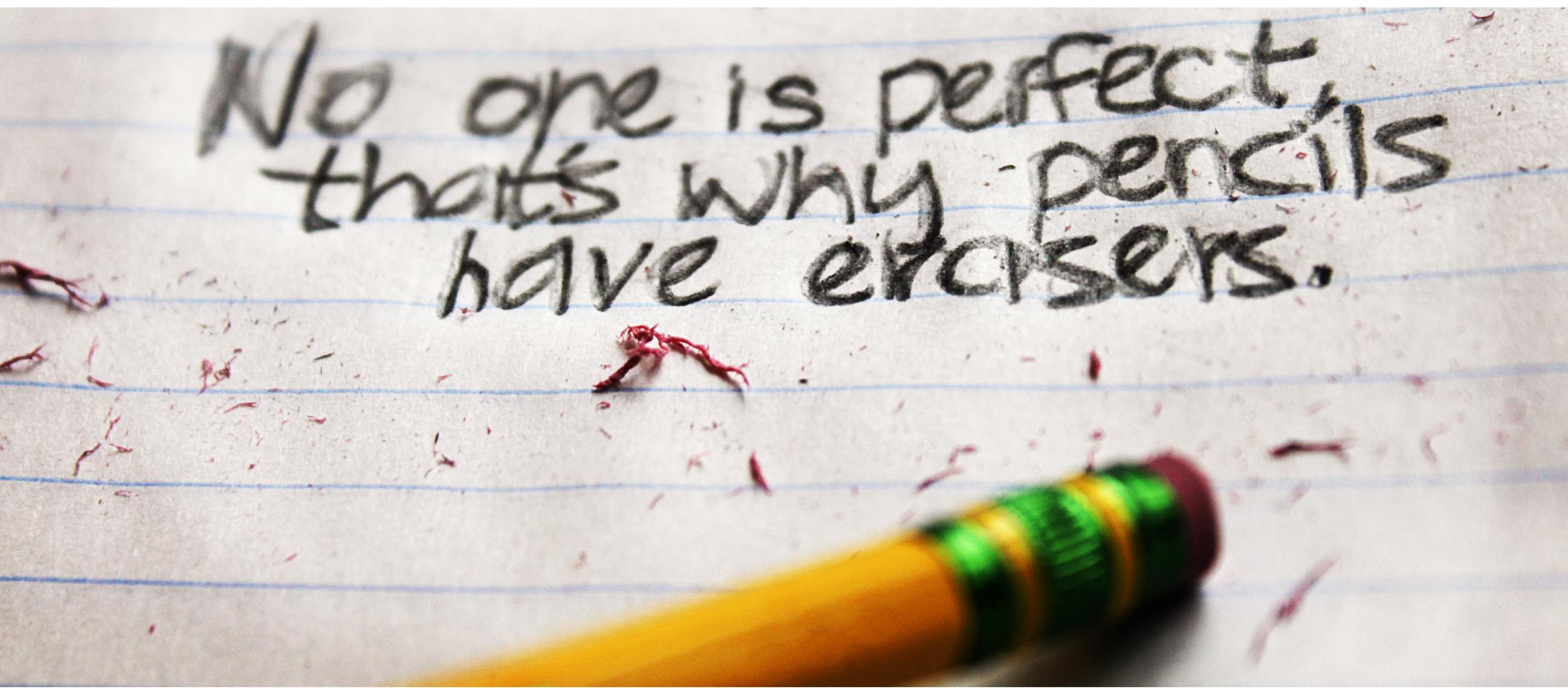
Delete to end of line

Ctrl

Delete

^ Delete

If you mess up, don't freak...



Undo last action

Ctrl Z

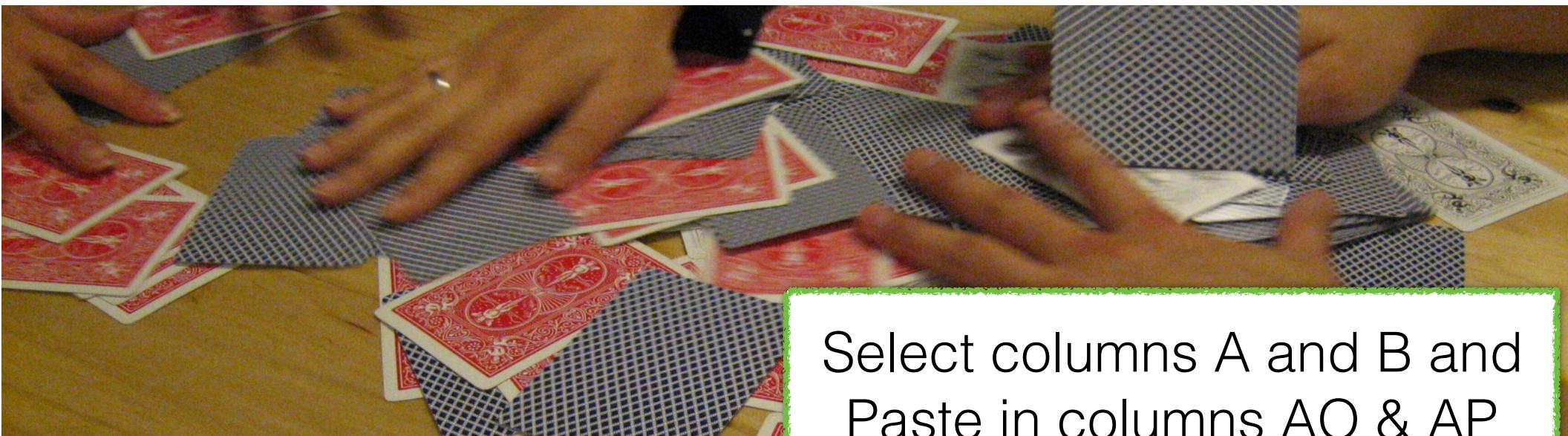
⌘ Z

Redo last action

Ctrl Y

⌘ Y

Move things around...



Select columns A and B and
Paste in columns AO & AP

Copy selected cells	Ctrl C	⌘ C
Cut selected cells	Ctrl X	⌘ X
Paste content from clipboard	Ctrl V	⌘ V

Insert or get rid of columns & rows

Display Insert Dialog box	Ctrl	Shift	+	
Insert rows	Ctrl	Shift	+	
Insert columns	Ctrl	Shift	+	
Display Delete dialog box	Ctrl		-	
Delete rows	Ctrl		-	
Delete columns	Ctrl		-	
Delete cells	Ctrl		-	
Delete contents of selected cells	Delete			

Delete columns A & B

Insert a column and name it 'UniqID' before
OCCUPANCY_PERMITS_FACT_SID

Insert a column and name it 'Duplicate_SID' after
OCCUPANCY_PERMITS_FACT_SID

Teleport...

Make a reference to another cell

Step 1. Enter or select a cell

Step 2. Type “=”

Step 3. Point & click or arrow to
another cell

Step 4. Press enter

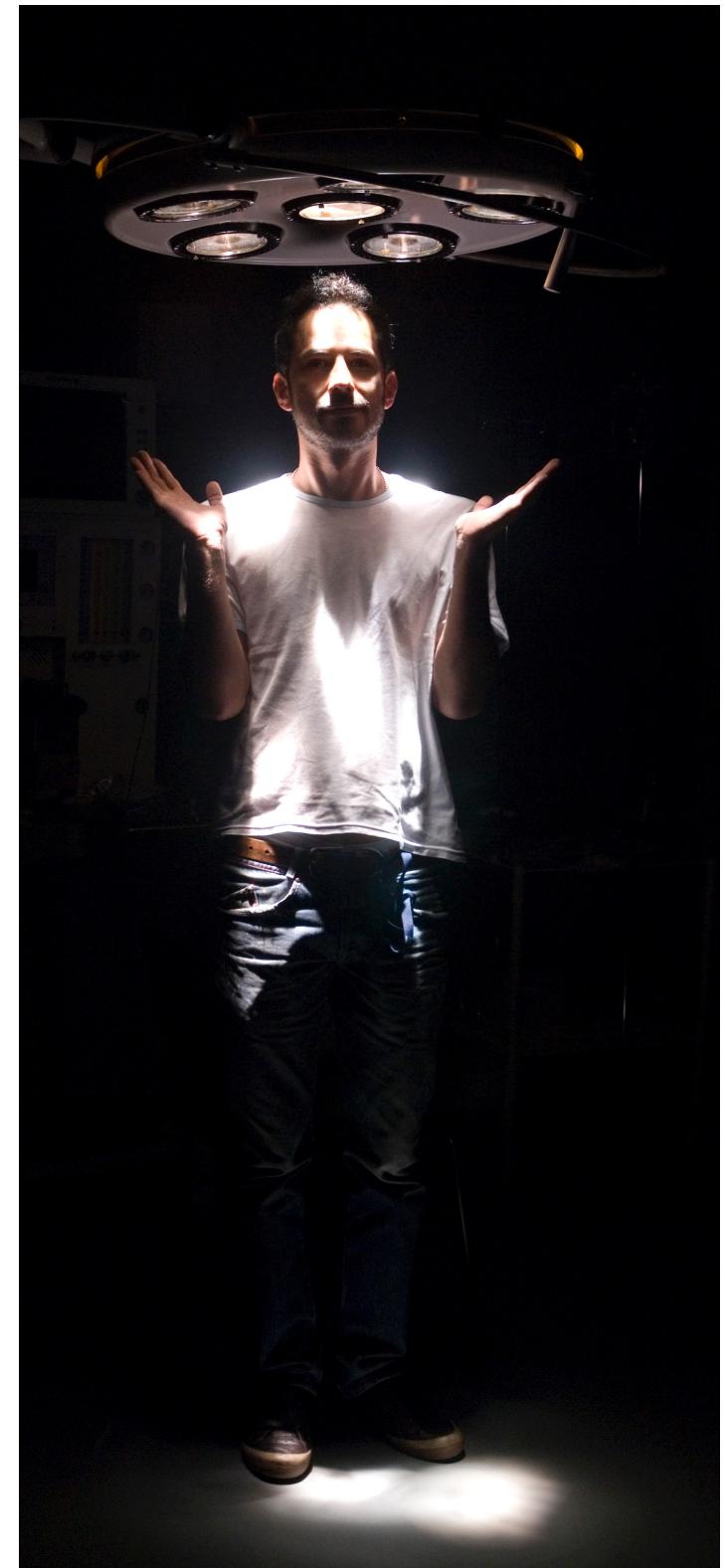
(You can also do this across sheets)

Reference

‘OCCUPANCY_PERMITS
_FACT_SID’ in the

column

‘Duplicate_SID’ (c2=b2)

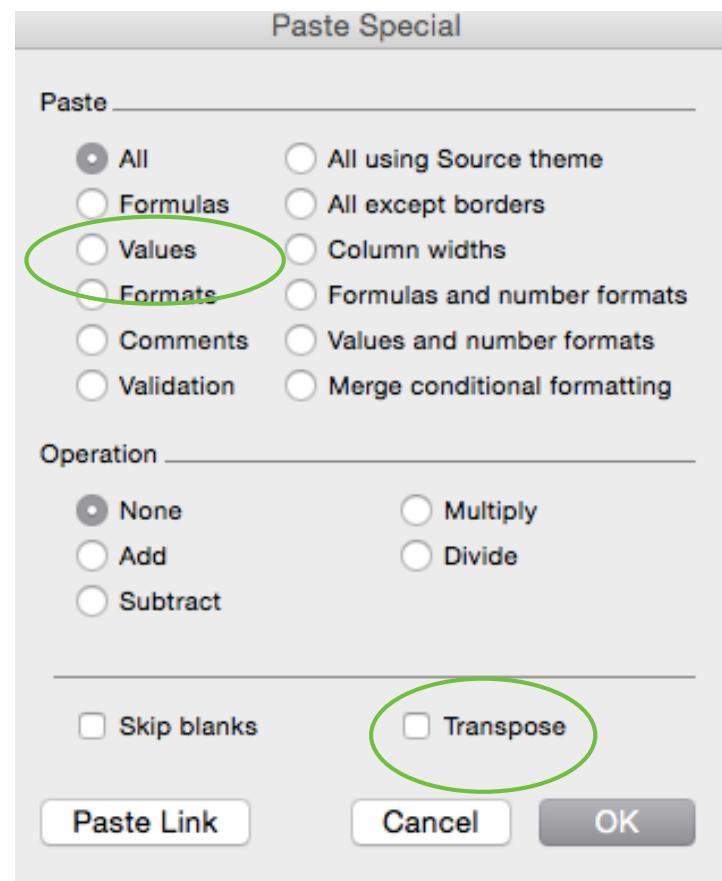


Get fancy...

(aka. advanced pasting options)



Copy 'Duplicate_SID' and paste special 'values.' What changed?



[Display the Paste Special dialog box](#)

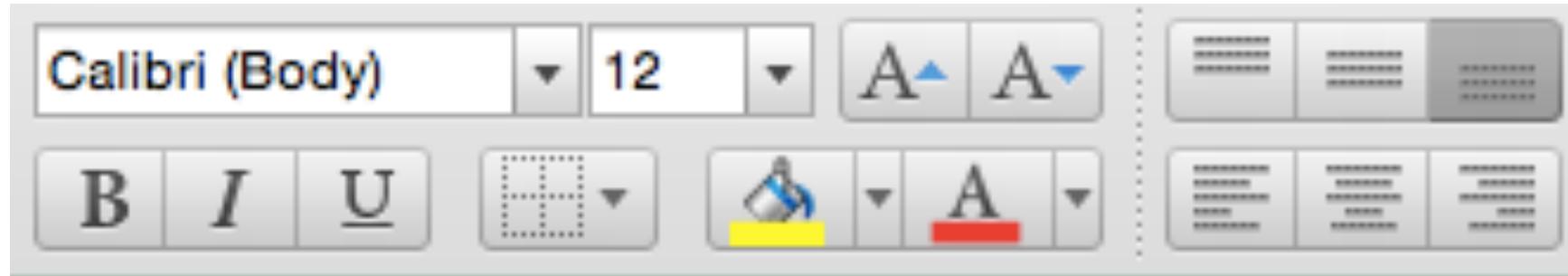
Ctrl Alt V

^ ⌘ V

FORMAT

- ✓ Change the look of text
- ✓ Sort and filter
- ✓ See full content of a cell
- ✓ Hide and unhide cells

Format rows, columns, and cells



Change the time format for
'PARKINGSTARTTIME'

Format (almost) anything Ctrl + 1 ⌘ + 1

Apply or remove bold formatting Ctrl + B ⌘ + B

Apply or remove italic formatting Ctrl + I ⌘ + I

Apply or remove underscoring Ctrl + U ⌘ + U

Filter & Sort



Select first row and apply auto filter.
Sort ascending
'LASTMODIFIEDDATE'

See full content of a cell

Expand

Manually

Click column header line
and drag

Expand 'PERMITTEE'

Automatically

Double click
column/row header

Precisely

Right click and select
'column width' or 'row height'



Image Credit: Biking Nikon SFO

See full content of a cell

Merge and wrap

APPLIEDBYNAME	TRACKING_N	EVENTDESCR
John Allen	10160803	Wedding
Allen Tubis	10166813	Other Special Events
Erin Eve	10174381	Wedding
Katie Schafer	10174593	Wedding
Alyssa Weiner	10176750	Mobile Crane Work Zone
Alyssa Weiner	10176750	Mobile Crane Work Zone
Lance Burleson	10177623	Wedding

Merge and wrap
records in
APPLIEDBYNAME

APPLIEDBYNAME	EVENTDESCRIPTION
John Allen	Wedding
Allen Tubis	Other Special Events
Erin Eve	Wedding
Katie Schafer	Wedding
Alyssa Weiner	Mobile Crane Work Zone
Alyssa Weiner	Mobile Crane Work Zone
Lance Burleson	Wedding



Hide content

Select row or
column

Right click, select
'Hide'

Unhide content

Select rows or
columns adjacent
to hidden content

Right click, select
'Unhide'



PRINT

- ✓ Print
- ✓ Get fancy

Print...



[Print file](#)

Ctrl

P

⌘ P

[Open print preview window](#)

Ctrl

F2

Get fancy printing...

The image shows two identical 'Page Setup' dialog boxes side-by-side. Both dialogs have tabs at the top: 'Page' (selected), 'Margins', 'Header/Footer', and 'Sheet'. The left dialog focuses on 'Orientation' (Portrait selected) and 'Scaling' (Adjust to: 100%, Fit to: 1 page wide by 1 tall). The right dialog focuses on 'Print titles' (Rows to repeat at top: empty, Columns to repeat at left: empty), 'Print' (Print area: empty, Gridlines, Row and column headings, Black and white, Comments: (None), Draft quality checked), and 'Page order' (Down, then over selected, Over, then down). Both dialogs have 'Cancel' and 'OK' buttons at the bottom.

No shortcuts for this one, sorry.
File > Print >> Page Setup

Repeat variable names
in each row.

CHEAT

- ✓ Carey Anne's Top 5
most frequently used favorite cheats

#5

Find and Replace

Display find and replace

Ctrl F

⌘ F

Display find and replace, replace selected

Ctrl H

⌃ H

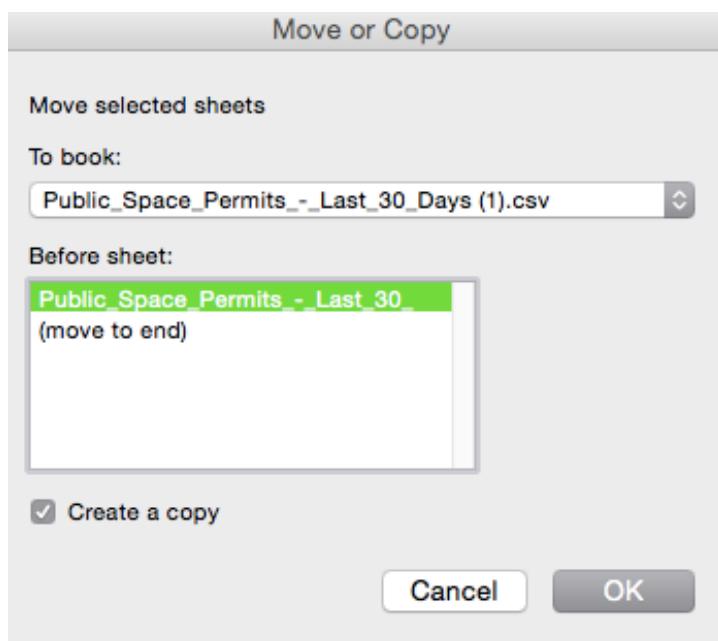


#4

Replicate an entire sheet

Right click worksheet

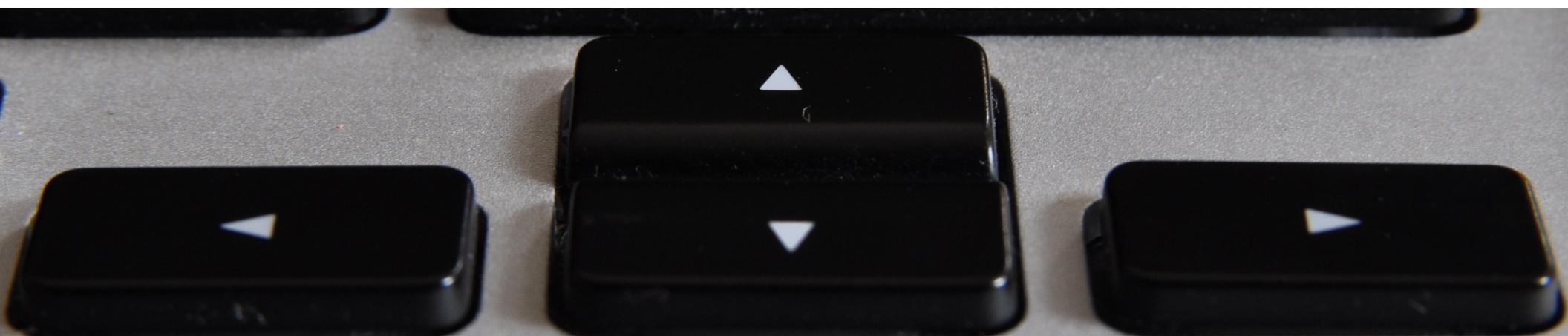
Select 'Move or Copy'

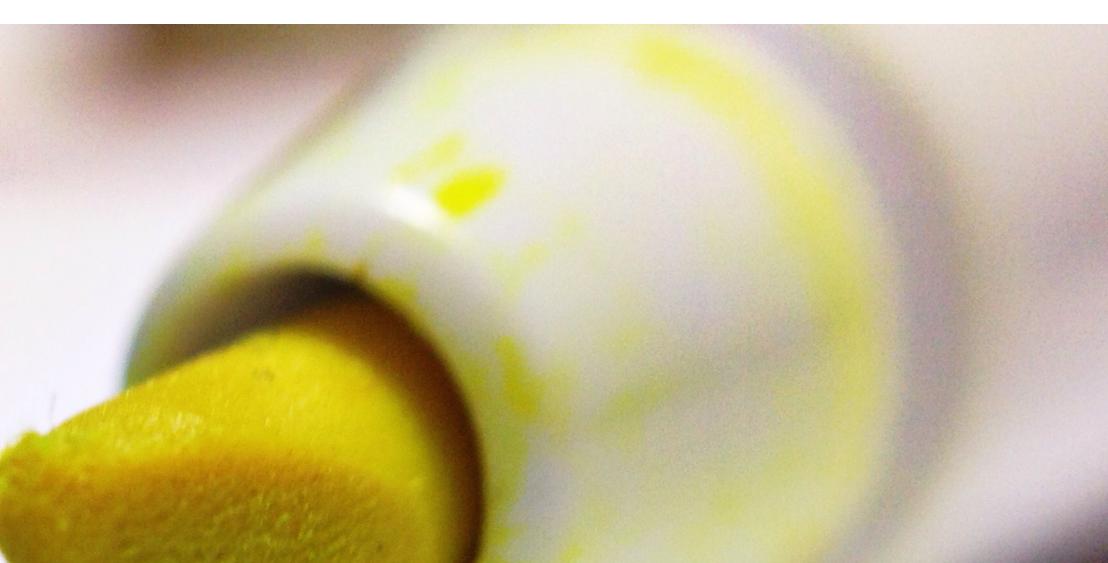


#3

Navigate cells

Move to right edge of data region	Ctrl →	⌘ →
Move to left edge of data region	Ctrl ←	⌘ ←
Move to top edge of data region	Ctrl ↑	⌘ ↑
Move to bottom edge of data region	Ctrl ↓	⌘ ↓
Move to beginning of row	Home	Fn ←





#2 Highlight cells

Just, add shift!

Move to right edge of data region	Ctrl	→	⌘	→
Move to left edge of data region	Ctrl	←	⌘	←
Move to top edge of data region	Ctrl	↑	⌘	↑
Move to bottom edge of data region	Ctrl	↓	⌘	↓
Move to beginning of row	Home		Fn	←

Select entire row	Shift	Space	⬆	Space
Select entire column	Ctrl	Space	⬆	Space

Note the select entire row arrow is the shift key

#1 Stop using the mouse to click into a cell

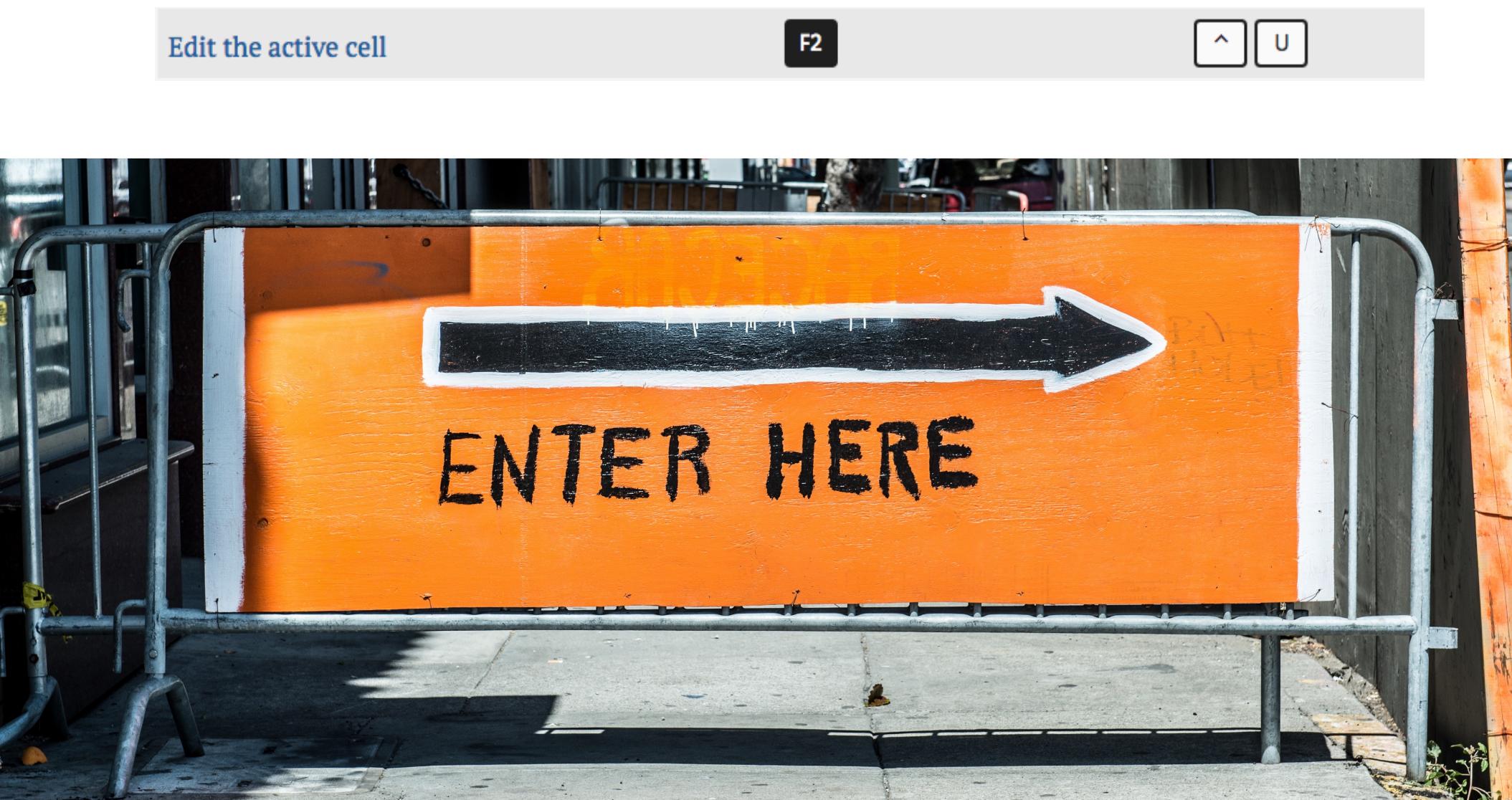


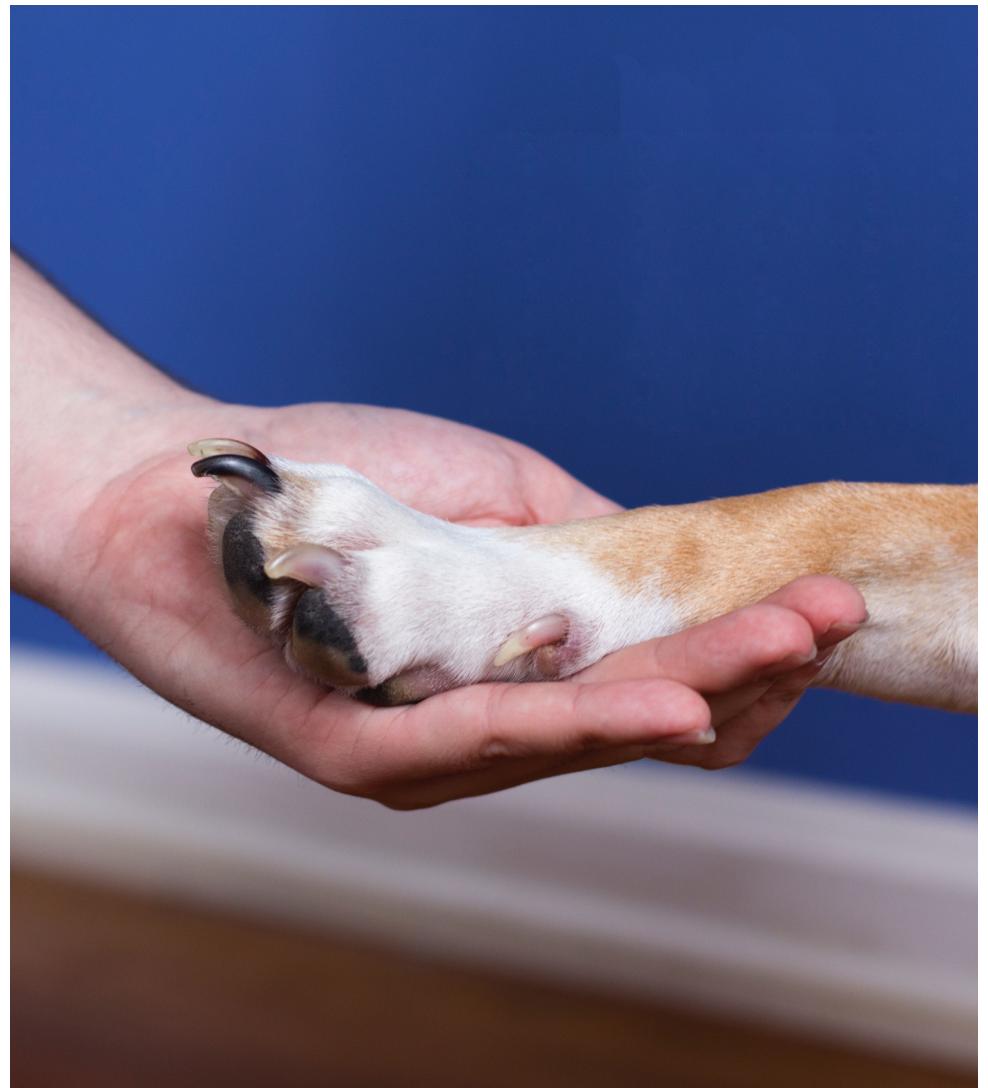
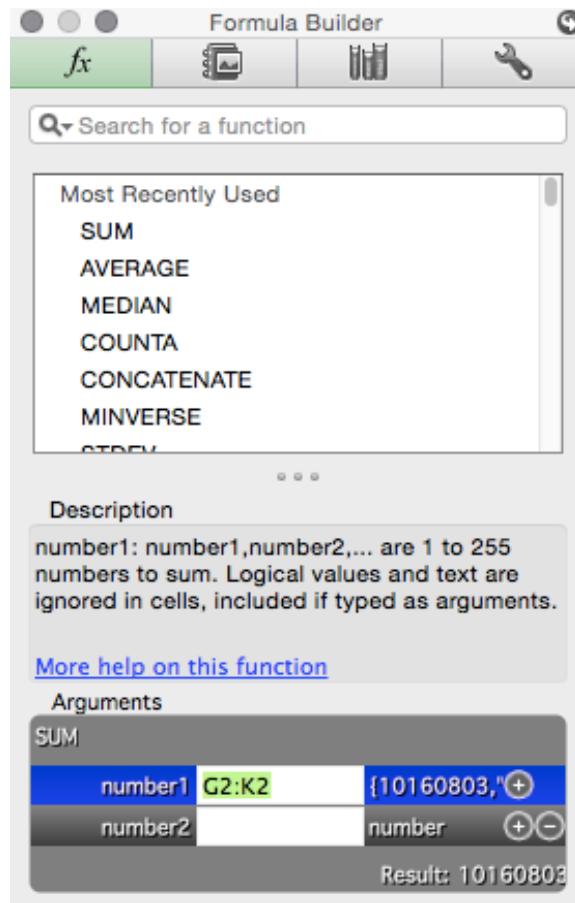
Image credit: Potential Pst

CALCULATE

- ✓ Running count & math
- ✓ IF family
- ✓ VLookup
- ✓ String manipulation
- ✓ Concatenate
- ✓ Text to Columns

Functions (for those who want a hand to hold)...

Perform calculations and manipulate data



Create a running count

Enter 1, 2, 3 vertically

Click small box in right corner and drag

E	F
UniqID	APPLIEDBYNAME
1	John Allen
2	Allen Tubis
3	Erin Eve
4	Katie Schafer
Alyssa Weiner	
Alyssa Weiner	
Lance Burleson	
Karen Hodges	

E	F
UniqID	APPLIEDBYNAME
1	John Allen
2	Allen Tubis
3	Erin Eve
4	Katie Schafer
5	Alyssa Weiner
6	Alyssa Weiner
7	Lance Burleson
8	Karen Hodges

Create a running count
using =(A1+1)

Do simple math

Perform calculations and manipulate data

Step 1. Enter or select a cell

Step 2. Type “=”

Step 3. Name and form function

SUM	Adds numbers
SUMPRODUCT	Multiplies arrays, then adds
COUNT	Counts numbers
AVERAGE	Average of numbers
MEDIAN	Median of numbers
MIN / MAX	Minimum or Maximum of numbers
POWER	Number taken to an exponent
IF	Conditional formula
SUMIF / COUNTIF	Conditionally adds or counts numbers
ROUND / ROUNDUP / ROUNDDOWN	Rounds numbers

Do simple math continued

Perform calculations and manipulate data

Parentheses	()
Exponent	\wedge or POWER(number, power)
Multiply	*
Divide	/
Add	+
Subtract	-

Reference another cell

Test whether one cell is equal to another

= <cell> = <cell>

Create a new variable to check if
APPLIEDNAME is the same as
PERMITTEE

If Then

Similar to the referencing another cell, but you can specify the outcome

Create a new variable that returns 1 if true and 0 if false to check if APPLIEDNAME is the same as PERMITTEE

The Ifs Family

- countif()
- countifs()
- sumif()
- sumifs()
- averageif()
- averageifs()



Count

For numeric counts

Counta

For string (words) counts

Countif

If you have requirements

Count the number of permits with Ward information
Count the number of permittees named “Allen Tubis”

V-Lookup

To find information related to records of interest

```
VL0OKUP( value, table, index_number, [not_exact_match] )
```

Step 1. Sort

Step 2. Value you are interested in searching

Step 3. Select 2 or more columns

Step 4. Number of column

Step 5. Type 'FALSE'

What type of EVENTDESCRIPTION of
TRACKING_NO 10178720?

String manipulation in Excel

to clean up dirty data

- `left()`, `right()`, `mid()`
- `search()`
- `len()`
- `trim()`
- `clean()`
- `upper()`, `lower()`
- `substitute()`
- `concatenate()`





Advanced string commands: LEFT(), RIGHT(), MID(), LEN(), SEARCH()

- **LEFT(*text, numCharacters*)** and **RIGHT(*text, numCharacters*)** let you take a subset of characters from the end of a string
- **MID(*text, startNum, numCharacters*)** lets you select characters from the middle of the string, starting at *startNum*
- **LEN()** is also a handy formula that tells you how many characters there are in the cell. Combines well with the other string formulas.
- **SEARCH(*find_text, within_text, start_num*)** is another handy formula that searches for a substring inside of another string. Combines well with the other string formulas.

Concatenate

Bring together two columns of data

Create a field with the full address, by concatenating
OWNERADDRESS, CITY, STATE, & ZIPCODE

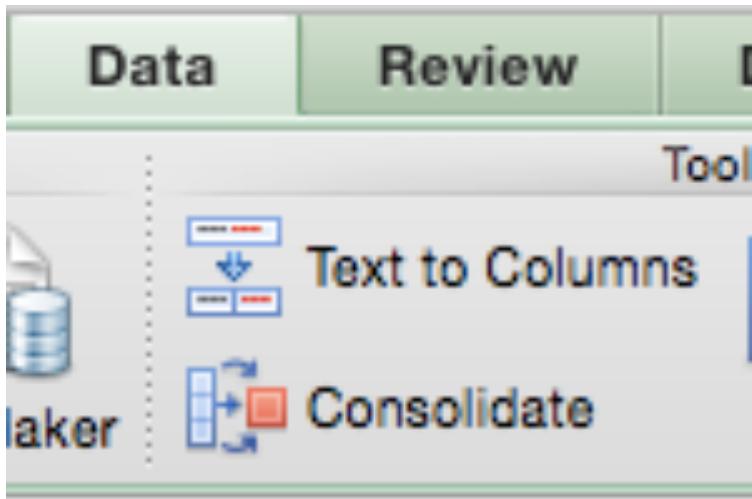
=CONCATENATE(R2, V2, X2, AD2)

what is
happening
here?

=CONCATENATE(R2, " ", V2, " ", X2, " ", AD2)

Text to columns

separates one column into two



Convert Text to Columns Wizard - Step 1 of 3

The Text Wizard has determined that your data is Delimited.

If this is correct, choose Next, or choose the Data Type that best describes your data.

Original data type

Choose the file type that best describes your data:

Delimited - Characters such as commas or tabs separate each field.
 Fixed width - Fields are aligned in columns with spaces between each field.

Data preview

Preview of selected data:

1	ANC
2	2E
3	2C
4	2C
5	2F
6	2C

Cancel < Back Next > Finish

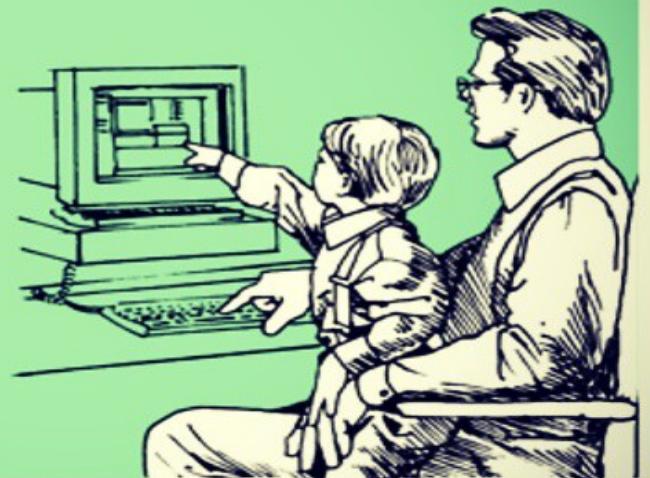
Separate the alpha-numeric ANC code into two columns

PIVOT

- ✓ What?
- ✓ How?
- ✓ Modify?

Yes son a pivot table would be quicker, but I've told you my boss's stance on things he doesn't understand

someecards
user card



What are pivot tables?

- Tool to explore data
- Quick aggregation technique for clean data
- Helps find relationships between fields
- Identifies unique values in data
- Generates a report



How do I make one?

- Highlight the raw data
- Go to Data> Pivot Table
- If you're asked to save to a new / existing sheet, select new



(Note: pivot tables can be unstable with BIG datasets, so save work before creating them)

How do I make one?

- **Add/remove fields** by dropping them into the appropriate parts of the PivotTable builder interface
- Apply **additional filters** on values by clicking on the arrows next to each field name



Let's practice pivot tables

Modify the pivot table to

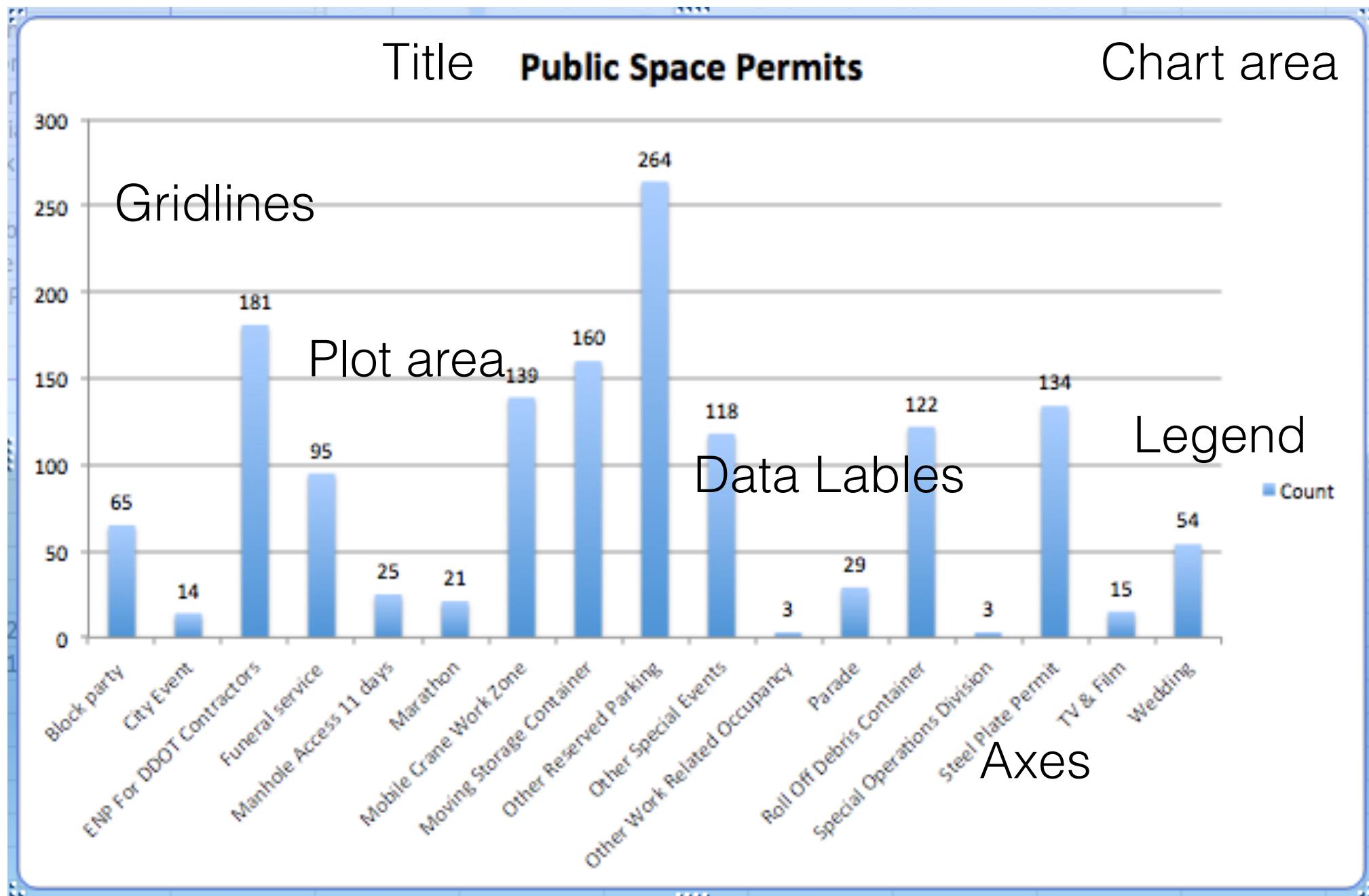
- count the number of IDS, rather than SUM
- group RESUBMIT and RESUBMITTD
- Change the row labels to zip code

The screenshot shows the 'PivotTable Builder' dialog box. At the top, there is a list of 'Field name' options with checkboxes: OCCUPANCY_PERMITS_FACT_SID (checked), APPLICATIONDATETIME, APPLIEDBYNAME, TRACKING_NO, and EVENTDESCRIPTION (checked). Below this is a section titled 'Drag fields between areas'. On the left, under 'Report Filter', is a field labeled 'STATUS'. On the right, under 'Column Labels', is a field labeled 'Sum of O...'. At the bottom, under 'Row Labels', is a field labeled 'EVENTDE...', and under 'Values', is a field labeled 'Sum of O...'. There is also a search bar at the top right labeled 'Search fields'.

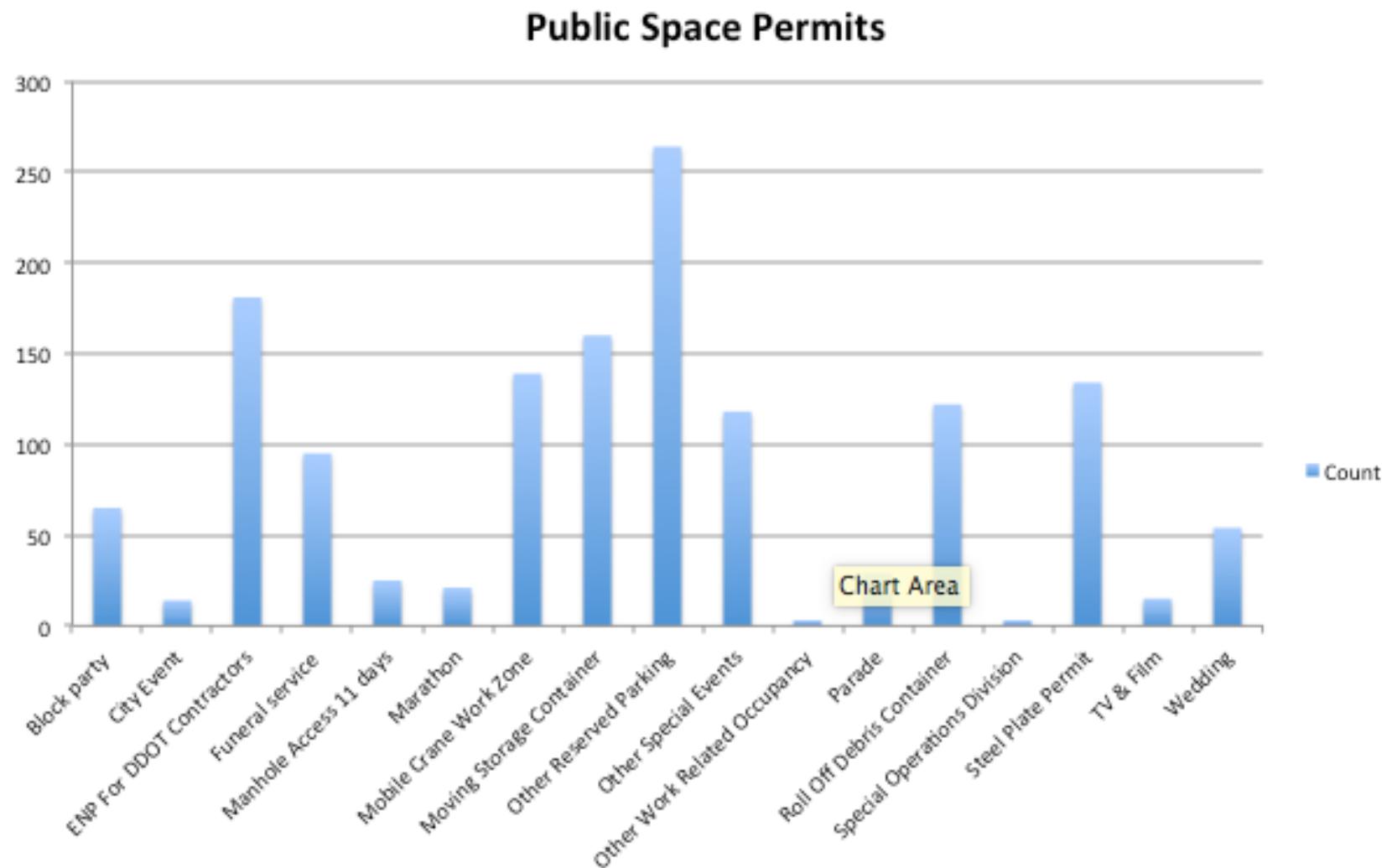
CHART

- ✓ Create
- ✓ Vocab 101
- ✓ Format

Chart vocal 101

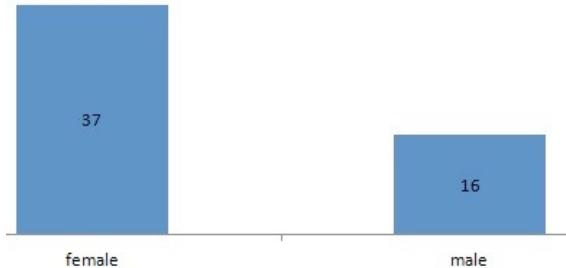


Create charts

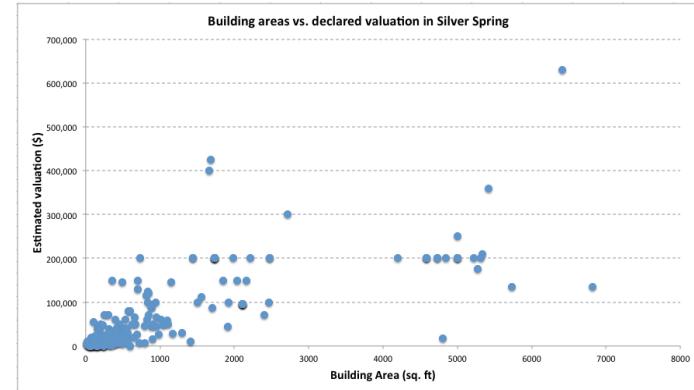


Choosing Charts?

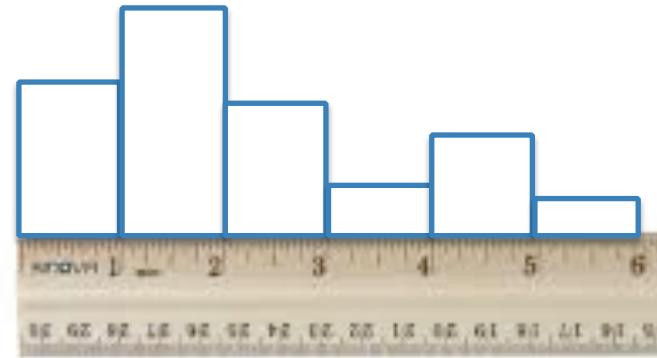
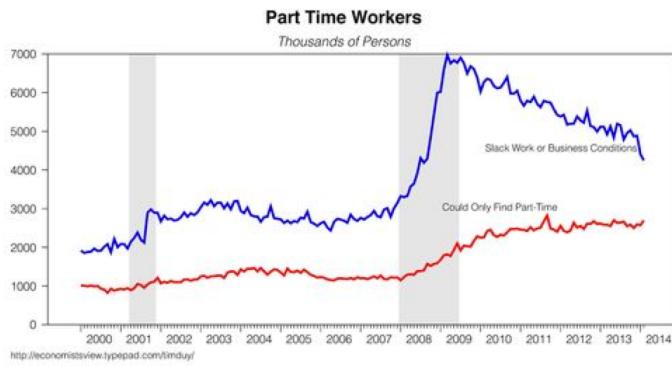
Bar Chart - data in categories



Scatter plot - comparing variables



Line Chart - continuous data (over time) Histogram - frequency of data in intervals



Format your charts

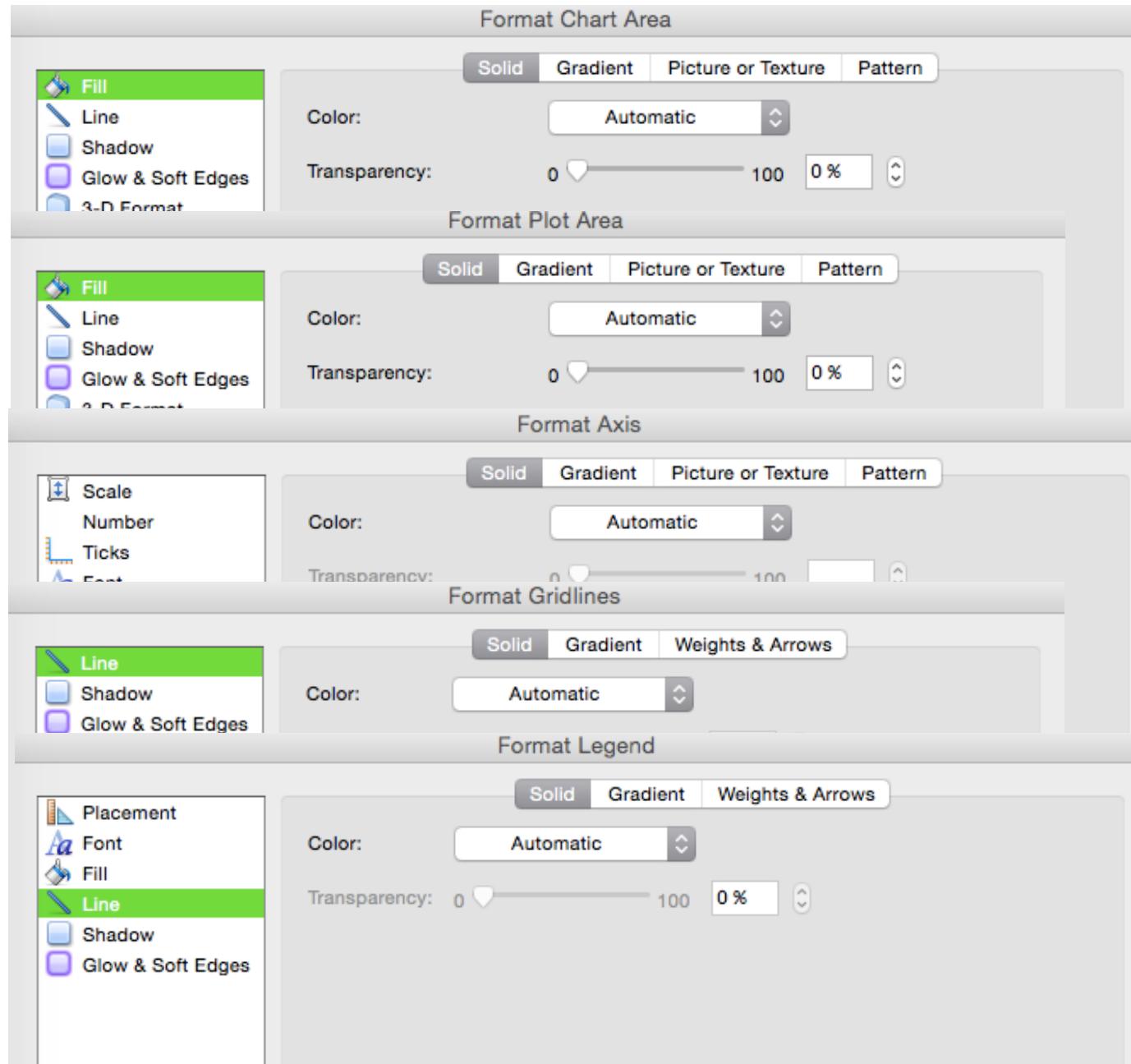
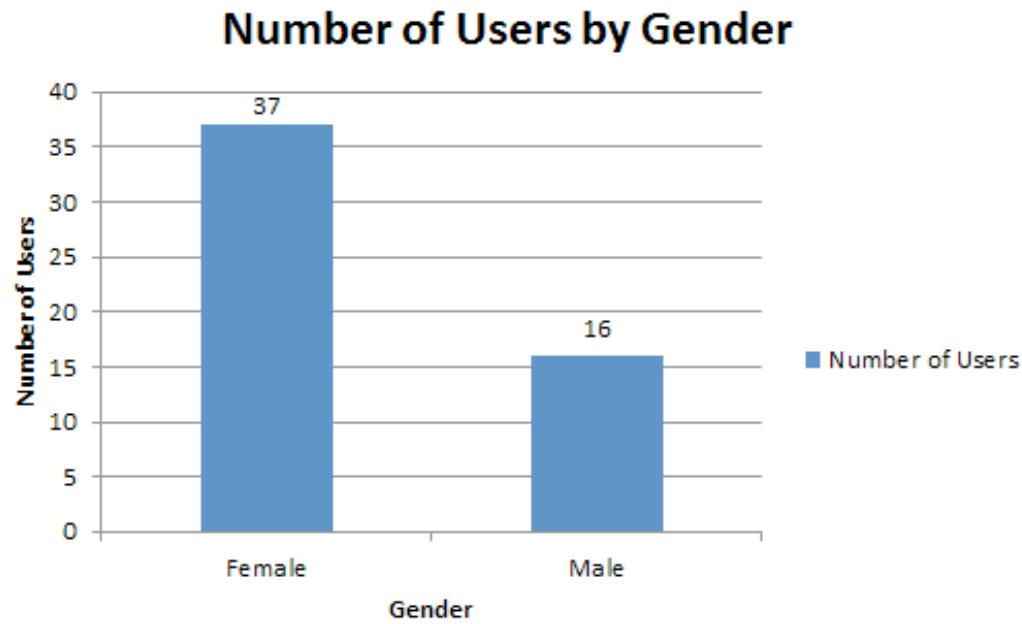


Chart area
Plot area
Titles
Axes
Data Labels
Gridlines
Legend

Best practices for presentations

1. Make the title descriptive
2. Label axes when necessary
3. Get rid of extra whitespace
4. Get rid of redundancies
5. Keep the colors distinct
6. Everything has a purpose!



Look at you, Excel Wizard!

Carey Anne Nadeau
CEO, Open Data Nation
info@opendatanation.com



MORE RESOURCES

References & where to go next

<https://exceljet.net/keyboard-shortcuts> - all the shortcuts from today's lecture, and more

[http://opendata.dc.gov/datasets/1b852a5bc96d4d12be86918259c883c6_16?
filterByExtent=true&uiTab=table](http://opendata.dc.gov/datasets/1b852a5bc96d4d12be86918259c883c6_16?filterByExtent=true&uiTab=table) - raw data used in today's lecture

<http://chandoo.org/wp/> - become awesome at Excel

<http://peltiertech.com/> - advanced Excel charts

<http://www.contextures.com/> - Excel tutorials

<http://www.mrexcel.com/forum/index.php> - amazing Excel forum

<https://www.youtube.com/watch?v=0nbkaYsR94c> - "You suck at Excel", great Youtube video

[https://www.reddit.com/r/IAmA/comments/3rid26/
we_are_the_microsoft_excel_team_ask_us_anything/](https://www.reddit.com/r/IAmA/comments/3rid26/we_are_the_microsoft_excel_team_ask_us_anything/) - AMA with the Excel team

<https://support.office.com/en-us/excel> - official Microsoft documentation

Index & Match, Just in case you care

- ▶ $=\text{INDEX}(array, row\ number)$ - returns value at specified index of array
- ▶ $=\text{MATCH}(lookup\ value, lookup\ array, match\ type)$ - finds the lookup item and returns the location in the array
- ▶ Combined is very powerful:
- ▶ $=\text{INDEX}(column\ with\ data\ you\ want, \text{MATCH}(value\ you\ are\ looking\ for, column\ which\ contains\ this\ data, 0))$

Index & Match, Just in case you care

- ▶ VLOOKUP more popular and better known
- ▶ VLOOKUP is easier initially
- ▶ INDEX - MATCH is faster than VLOOKUP
- ▶ INDEX - MATCH is more versatile - can look to the left