

Data Analytics with Excel

Week 3: Charts and Tables

USC Annenberg Digital Lounge

Grab the guide at: digital-lounge-excel.carrd.co

After today's session

- Create and modify a pivot table
- Select an effective chart type based on a scenario
- Understand static vs. pivot charts
- Format charts effectively with layouts and labeling

Today's topics

- Define and create a table and chart
- Define and create a pivot table and pivot chart
- Named ranges and labeling
- Conditional formatting

Covered so far

- Data formatting basics
- Data validation
- Basic formulas
- Combining formulas
- VLOOKUP and XLOOKUP

The problem to solve

- You do marketing for a large network of 500 podcasts
- For each category of our shows, find the average number of downloads per month

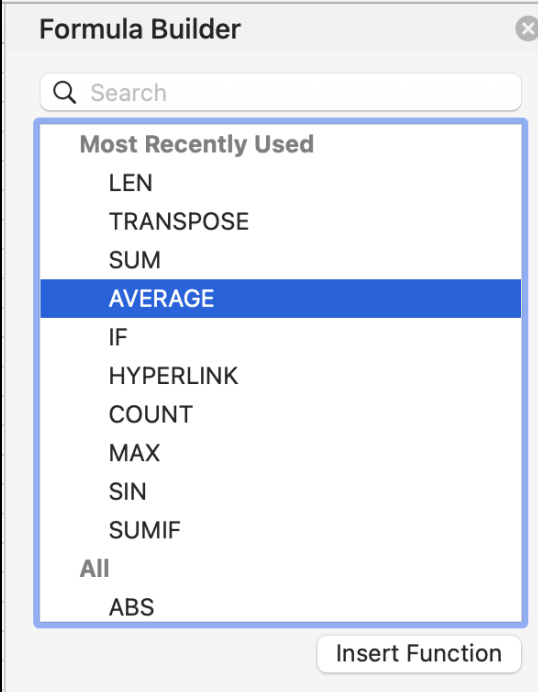
Formula basics review

- Insert → Function to see the list of options
- Syntax:
 - How many arguments
 - Meaning of each argument
- Insert Function button
 - Or type **=function(argument)** in formula bar

=AVERAGE(D:D)

=COUNTIF(F2:F15,">2")

=SUMIF(F2:F15,">2",G2:G15)



The screenshot shows the 'Formula Builder' dialog box in Excel. At the top is a search bar. Below it, a list of functions is shown under the heading 'Most Recently Used'. The functions listed are LEN, TRANSPOSE, SUM, AVERAGE (which is highlighted with a blue background), IF, HYPERLINK, COUNT, MAX, SIN, SUMIF, and an 'All' button. Below the list is an 'Insert Function' button. Below the dialog box, the 'fx AVERAGE' section is visible, showing the description: 'Returns the average (arithmetic mean) of its arguments, which can be numbers or names, arrays, or references that contain numbers.' It also shows the 'Syntax' as 'AVERAGE(number1,number2,...)' and lists two arguments: 'Number1' and 'Number2', both described as 'number1,number2,... are 1 to 255 numeric arguments for which you want the average.'

Formula Builder

Search

Most Recently Used

- LEN
- TRANSPOSE
- SUM
- AVERAGE**
- IF
- HYPERLINK
- COUNT
- MAX
- SIN
- SUMIF

All

- ABS

Insert Function

fx AVERAGE

Returns the average (arithmetic mean) of its arguments, which can be numbers or names, arrays, or references that contain numbers.

Syntax

AVERAGE(number1,number2,...)

- **Number1:** number1,number2,... are 1 to 255 numeric arguments for which you want the average.
- **Number2:** number1,number2,... are 1 to 255 numeric arguments for which you want the average.

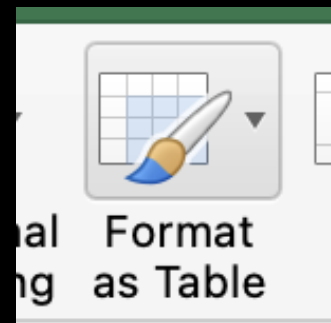
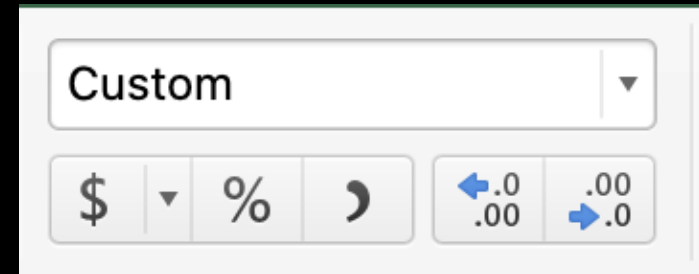
Static table or "regular table"

- Clear header for every column
- May have formulas/calculations or not!
- Format numbers
 - Units, decimals, commas as needed
 - If it's not fractional, don't display decimals
- Use **Format as Table** on your final product

Item	Price
Drip Coffee	\$3.00
Matcha Latte	\$6.50
Cappuccino	\$5.00

Best practices for tables

- Clear header for every column
- Format numbers
 - Units, decimals, commas as needed
 - If it's not fractional, don't display decimals
- Use **Format as Table** on your final product



Activity Part 1

- Download the dataset: digital-lounge-excel.carrd.co

Create a summary table by category with these steps:

1. Select all the categories and paste them into the Summary tab
2. Use the Remove Duplicates tool to create a list of categories
3. Display how many shows are in each category using COUNTIF
4. Display the average monthly downloads for each category using AVERAGEIF
5. Sort by the average downloads, descending
6. Format as table, be sure to add clear headers!

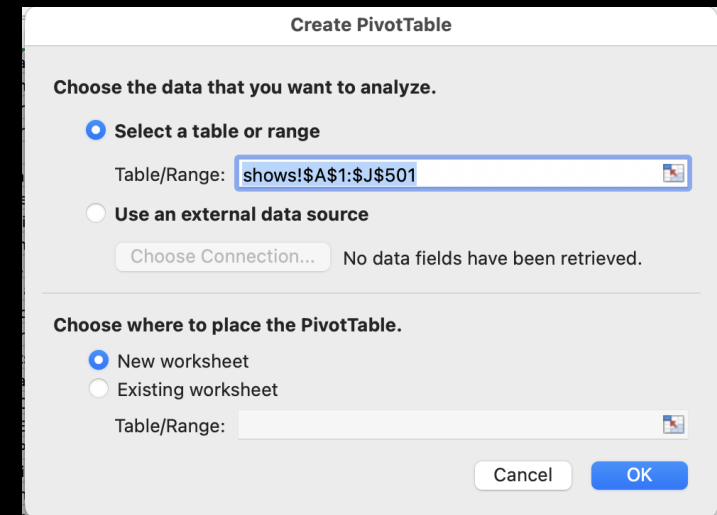
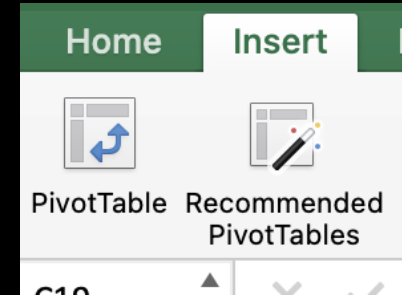
category	Average Monthly Downloads	Number of Shows
Technology	450,243	50
Health	424,032	41
True Crime	422,332	44
Education	414,522	49
Science	399,169	49
Comedy	380,478	55
Arts	378,070	49
Business	367,015	62
Sports	360,638	43
News	335,278	43

Why pivot tables?

- They accomplish the same thing we just did, but way more easily and faster!
- The formulas we just did are conceptually the same thing that the pivot table will do
- AND, pivot tables add a lot of helpful other features!
 - Quickly change summary without re-writing a formula
 - Change display format

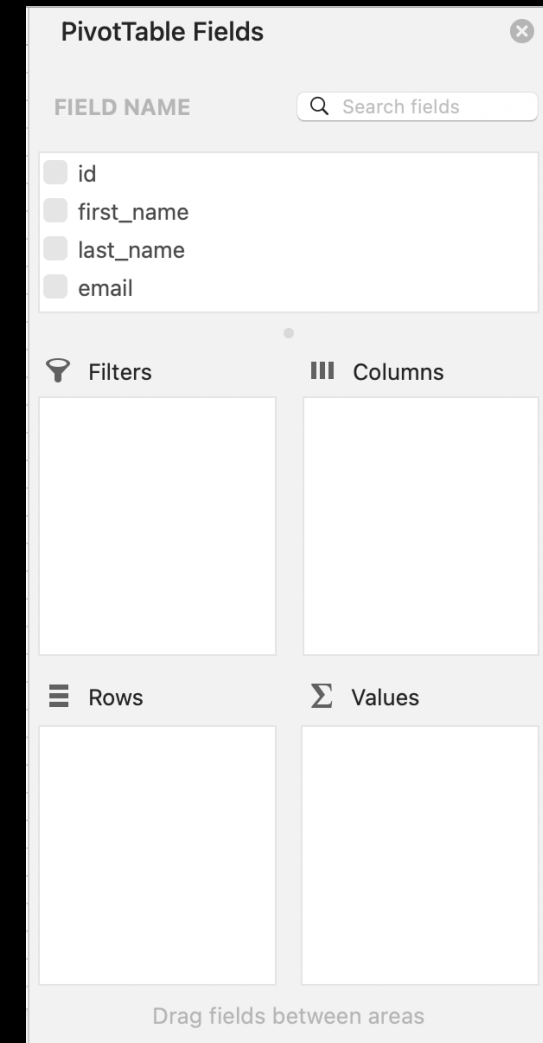
To create a pivot table

- Select all your data
 - Click one cell of your data, then Cmd-A / Ctrl-A
- Insert → PivotTable
- Double-check your range makes sense
- Choose PivotTable location (usually new worksheet)



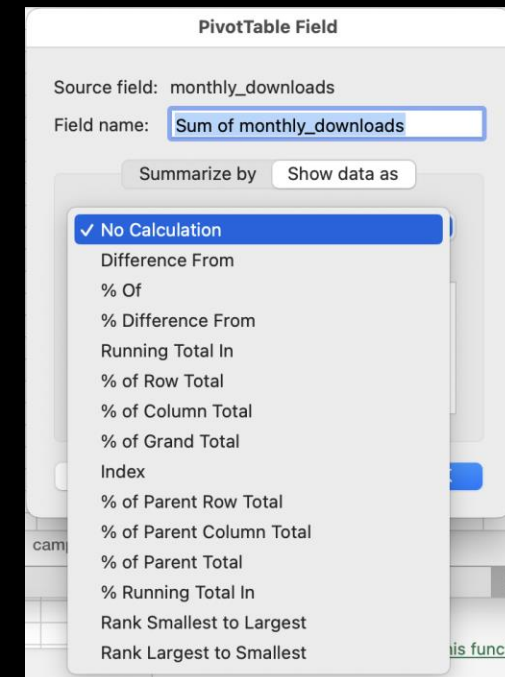
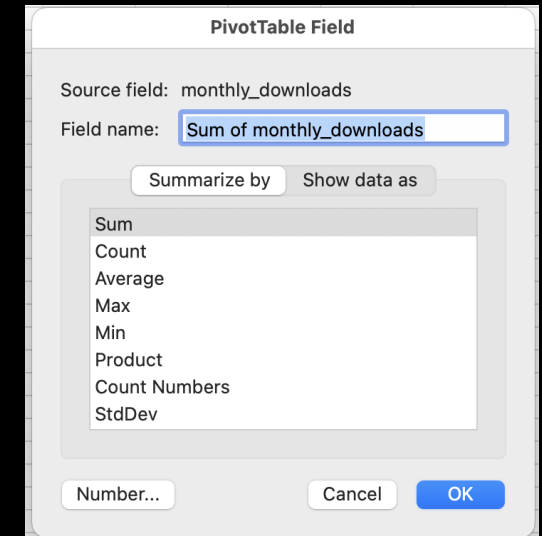
Build your pivot

- Field List lists all the columns from your source sheet
- Drag and Drop those columns into the 4 parts of the pivot table
 - Rows
 - Values
 - For simple pivots, you can skip columns and filters
- See the results of your changes immediately to the left!



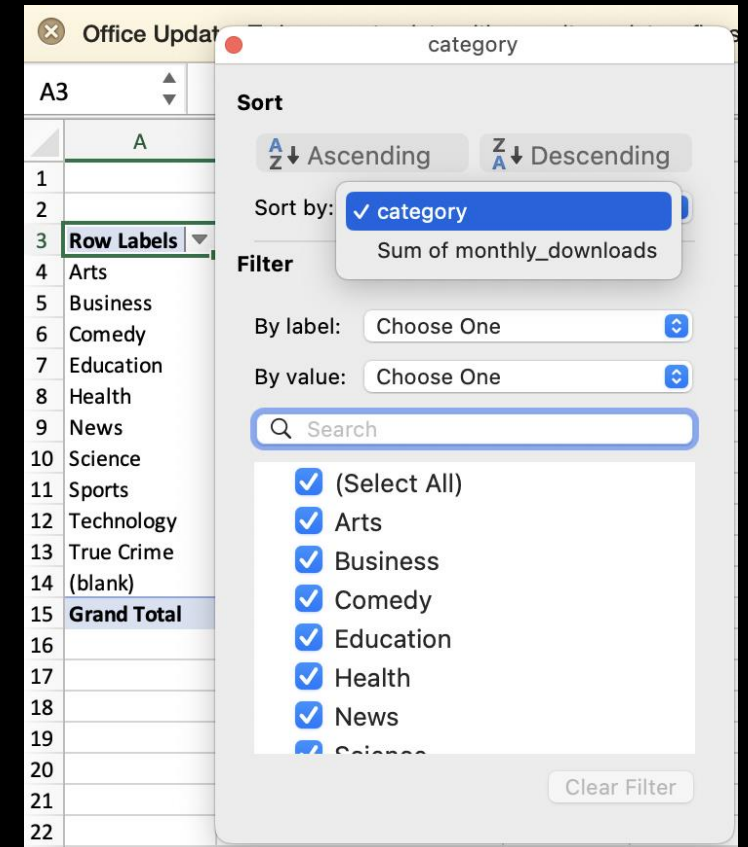
Customize your pivot

- Click the “i” icon next to a field name to set the formatting
- Pop-up will give you options to:
 - Summarize By
 - Show Data As
- See the results of your changes immediately to the left!



Sort your pivot

- Click the  next to “Row Labels” for smart sorting options
- Change “sort by” to sort by any column values



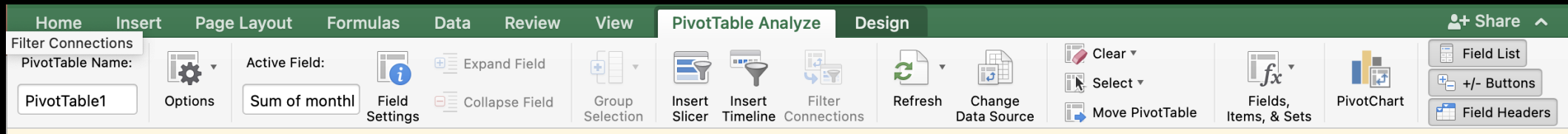
Activity Part 2

Same dataset: digital-lounge-excel.carrd.co

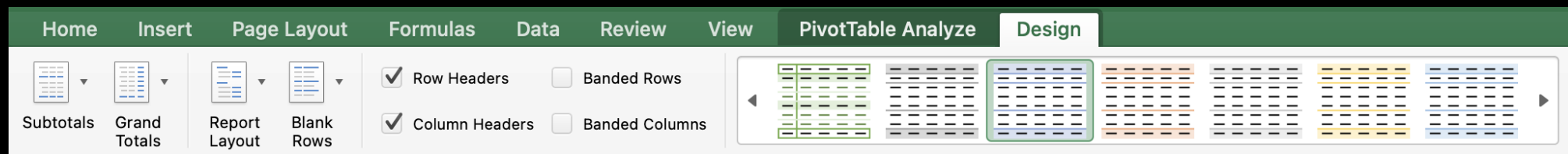
1. Create a PivotTable to show the same result as Part 1 (for each category, average number of downloads, and total number of shows)
2. Change the number of shows column to display the percent of total
3. Use a pivot table to find: How many *total* monthly downloads do we get from News shows?

Pivot table tips

- Whenever you click into your pivot table, you get two new sections of the top ribbon: Analyze and Design
- Field List on the top right will show/hide the builder view



- Design tab lets you set colors, grand totals, etc.

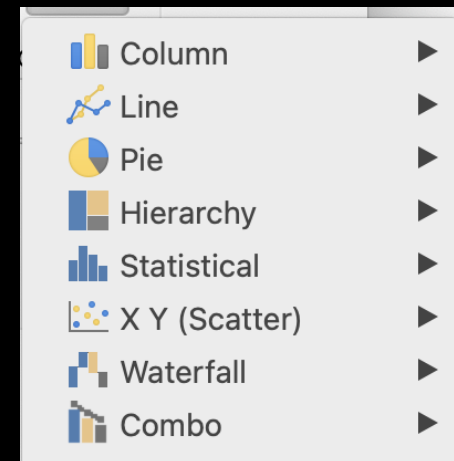


Adding a pivot chart

- From the Analyze ribbon, click PivotChart
- A chart will automatically populate!
- You'll get more new ribbons at the top: PivotChart Analyze and Design



- Under Design, you can:
 - Change Chart Type
 - Quick Layout
 - Add Chart Element
 - Change Colors



Non-pivot charts

- Everything we just talked about to insert a chart can be done from a static non-pivot table, like the one we did at the beginning
- Select all data (Cmd-A / Ctrl-A) and use Insert → Chart
- These require a lot more manual formatting
- Like tables – if you need a chart, it's usually best to do a pivot chart instead of a regular chart!

Activity part 3

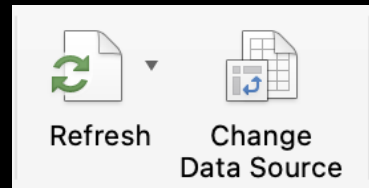
Same dataset

1. Create a pivot chart from your pivot table
2. Change the Chart Type, Layout, and Colors until you have a chart you like
3. Give it a descriptive title

Just for fun: create a regular chart from your non-pivot table from part 1.

Adding or editing data in a pivot table

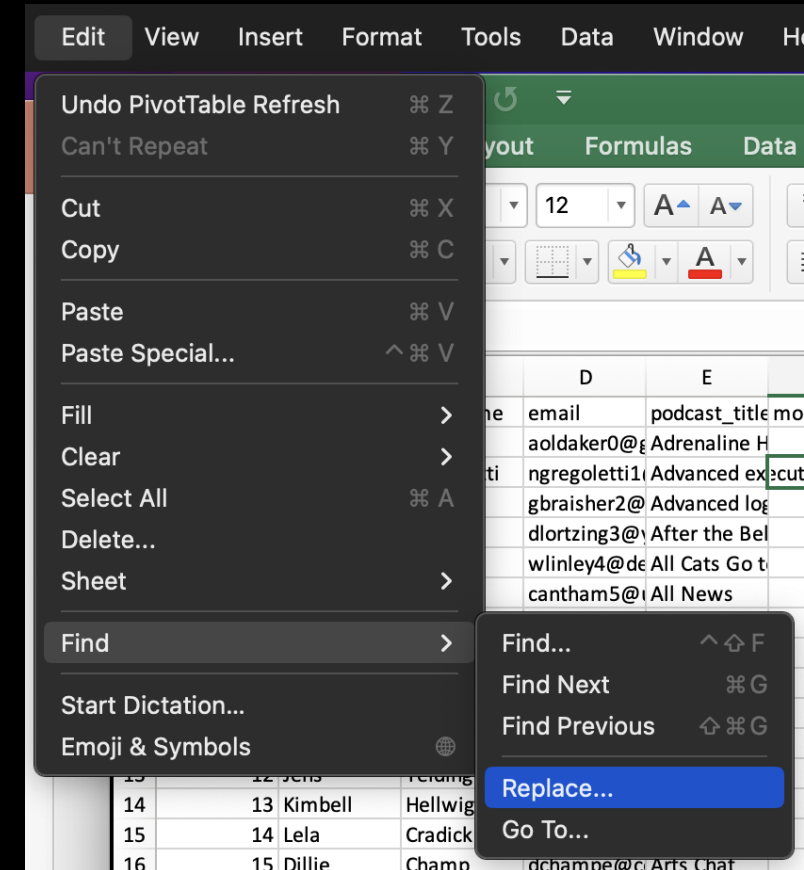
- If you add or edit any data in the source sheet of your pivot table, the chart will not automatically update until you refresh
 - Click the Refresh button in the Analyze tab
 - *Excel only! GSheets automatically updates*



- If you add rows to your source data, use **Change Data Source** to update the range
- Once the pivot table is refreshed, the pivot chart will auto-update!

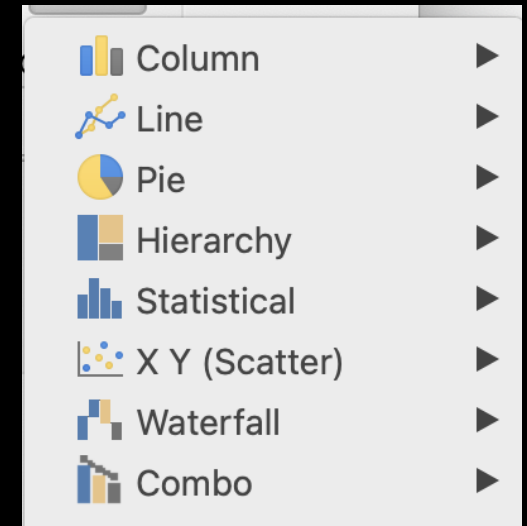
Activity part 4

1. On the shows source tab, use Edit → Find → Replace to change the cells “Technology” to “Tech”
2. Refresh your pivot table to reflect the change
3. Add a row to your dataset with a fake podcast and change the data source so that it’s included in your pivot table
4. Go back to your original table from part 1 – notice the error?



When to use which type of chart

- What is the point I'm trying to make to my audience?
 - “Our top categories of shows are Tech and Business”
 - “All major categories are represented in our shows”



Upcoming sessions

Mon. March 3: Data Dashboards with Excel

Feedback:

- Digital Lounge feedback: bit.ly/s25feedback
- Email me: whaleyr@usc.edu

Later this semester: SQL and Python!

