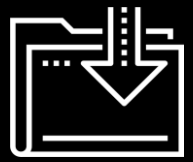
Egad! It's Excel

Data Boot Camp

Lesson 1.2



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A Few Admin Things

Class Repository and Zoom Video Feed

Class Git Repository

Classroom content, homework assignments

Class Videos

Automatically uploaded, on-demand videos

Quick Refresher

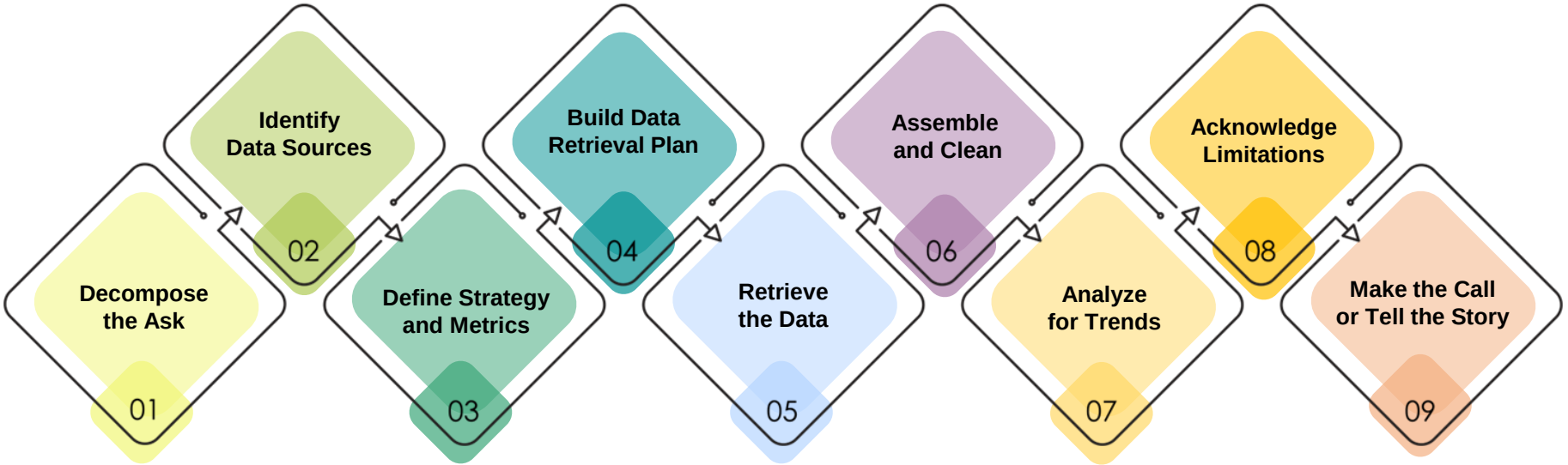
Data analytics is about what two things?

Fundamentally, data analytics is about storytelling and truth-telling.

What are the steps in the Analytics Paradigm?

Analytics Paradigm

Regardless of type or industry, this paradigm provides a repeatable pathway for effective data problem solving.



Let’s Start with the Basics

Instructor Demonstration

Excel Playground

Excited to get started?!

Formulas

Ooh…Coding! (Sort Of)

Excel has introduced you to a sort of proto-programming. When you write scripts, you will rely on `functions` (methods) that do something to or with `arguments`.

Ooh…Coding! (Sort Of)

When we reference a range or a set of ranges, Excel is given a set of `variable` inputs. Excel will determine the actual values of these inputs prior to executing the function.

Ooh…Coding! (Sort Of)

What about this example?

Which is the function?

Which are the arguments?

```
= SUM( AVG(F4:F6), AVG(G4:G6) )
```

Ooh…Coding! (Sort Of)

What about this example?
Which is the function?
Which are the arguments?

The **AVG functions** take the provided ranges as their arguments.

```
= SUM( AVG(F4:F6), AVG(G4:G6) )
```

Ooh…Coding! (Sort Of)

What about this example?
Which is the function?
Which are the arguments?

This is a **nested function**. We'll be doing plenty of complex nests in this class.

```
= SUM( AVG(F4:F6), AVG(G4:G6) )
```

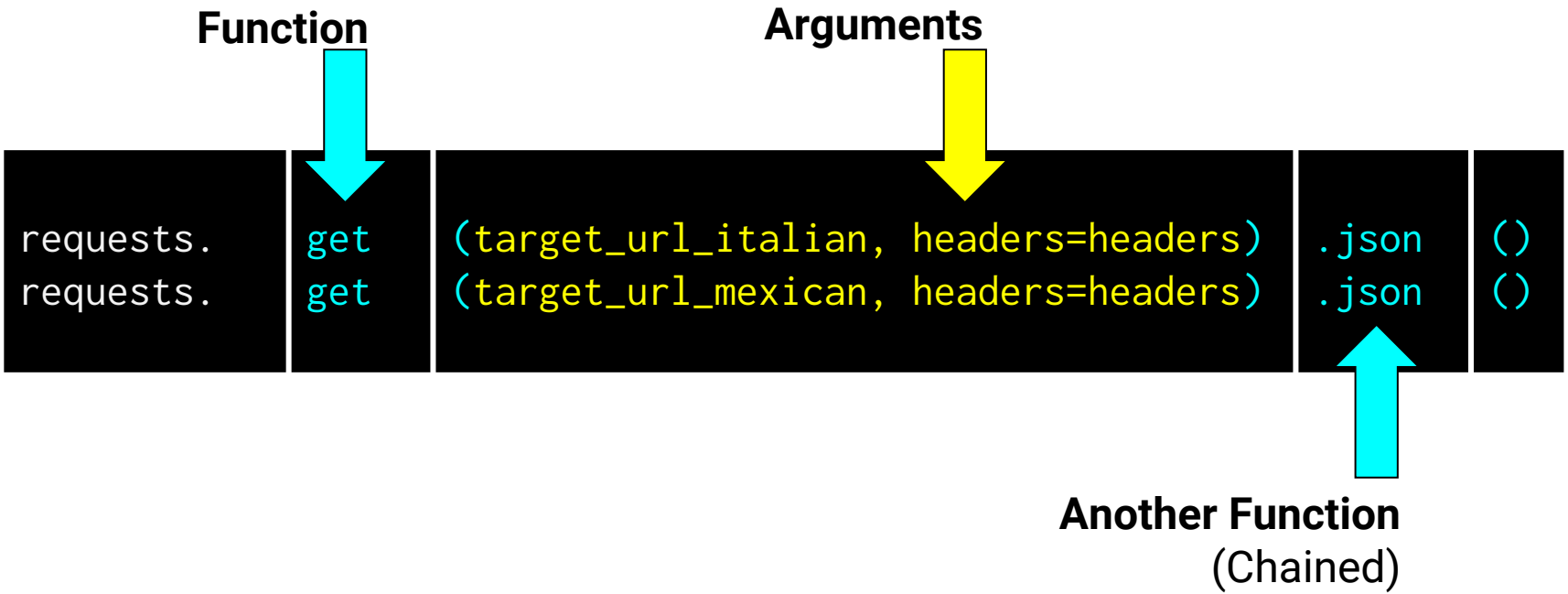
You Can Code Too!

Here’s a Python snippet from the last class.

```
requests.get(target_url_italian, headers=headers).json()
requests.get(target_url_mexican, headers=headers).json()
```

You Can Code Too!

Syntax and capabilities may differ across technologies and platforms, but fundamental concepts remain the same.



Time to <code>

Instructor Demonstration

Named Ranges

There are multiple ways to select data in a formula

Most of us learned to select a range of cells to input into a function

There are multiple ways to select data in a formula

But we can name a range of values to make interpreting formulas easier!

```
=AVG(A1:A10)
```

```
=AVG(prices)
```

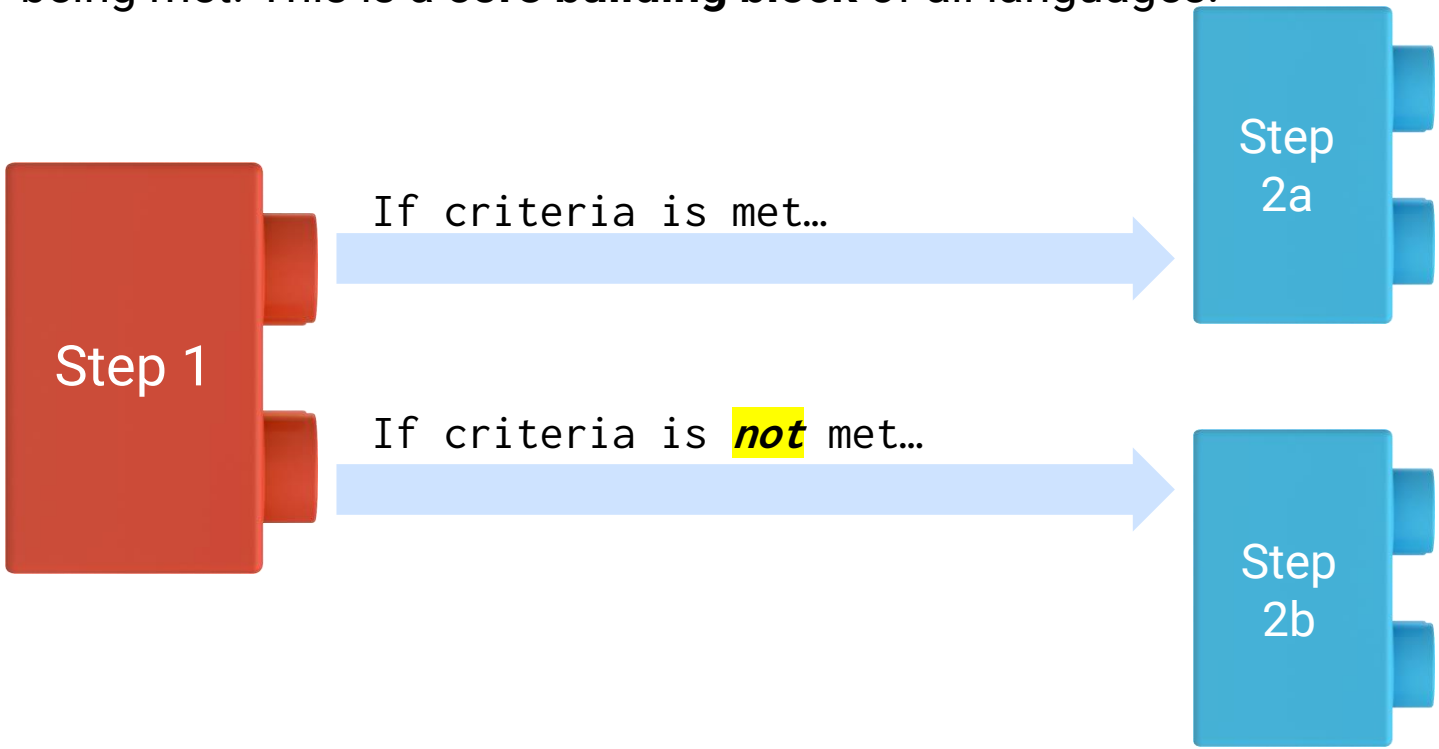
Time to <code>

Instructor Demonstration

Color Counter

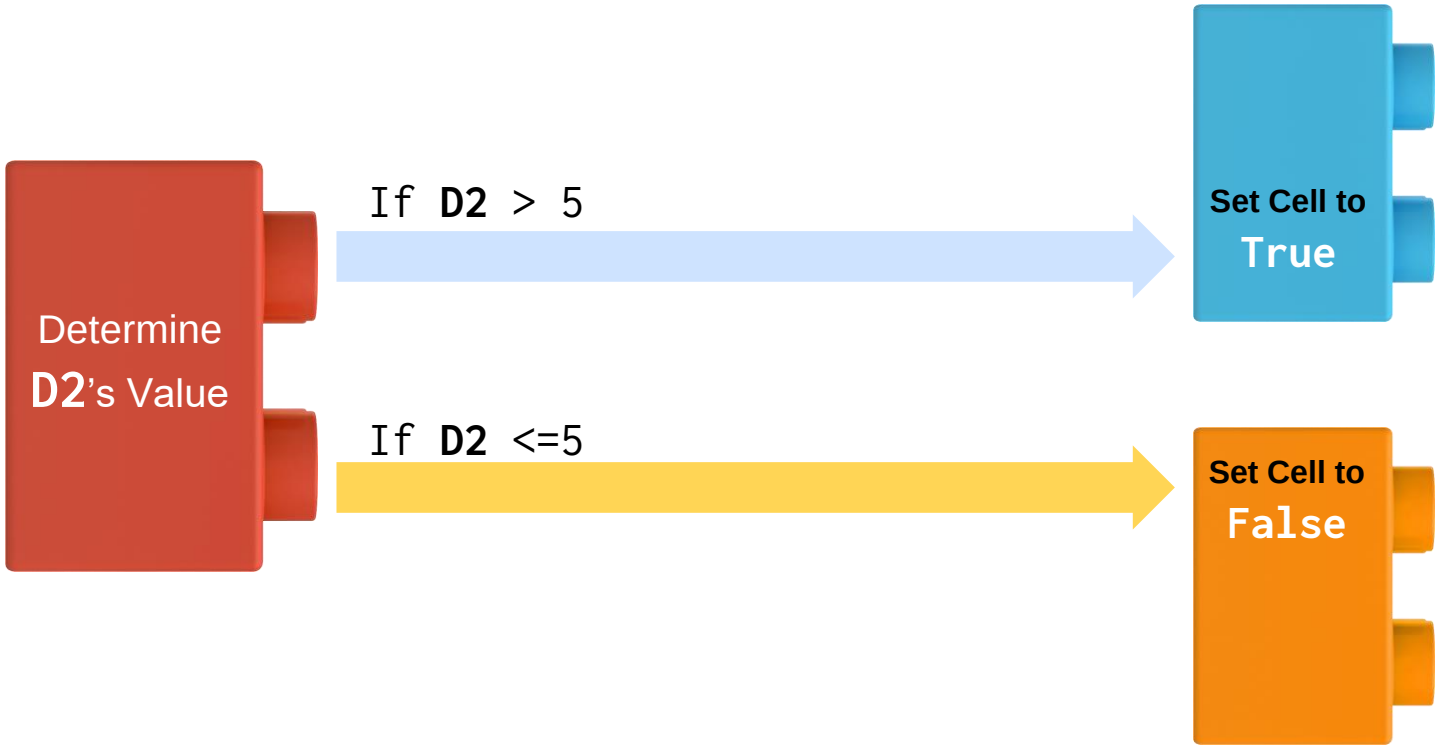
Conditionals: If This, Then That

Conditionals present a way to control the flow of logic based on certain criteria being met. This is a **core building block** of all languages.



Conditionals: If This, Then That

```
=IF(D2>5,TRUE,FALSE)
```



But what if we want to combine conditions?

AND, NOT, OR

Ooh…Coding! (Sort Of)

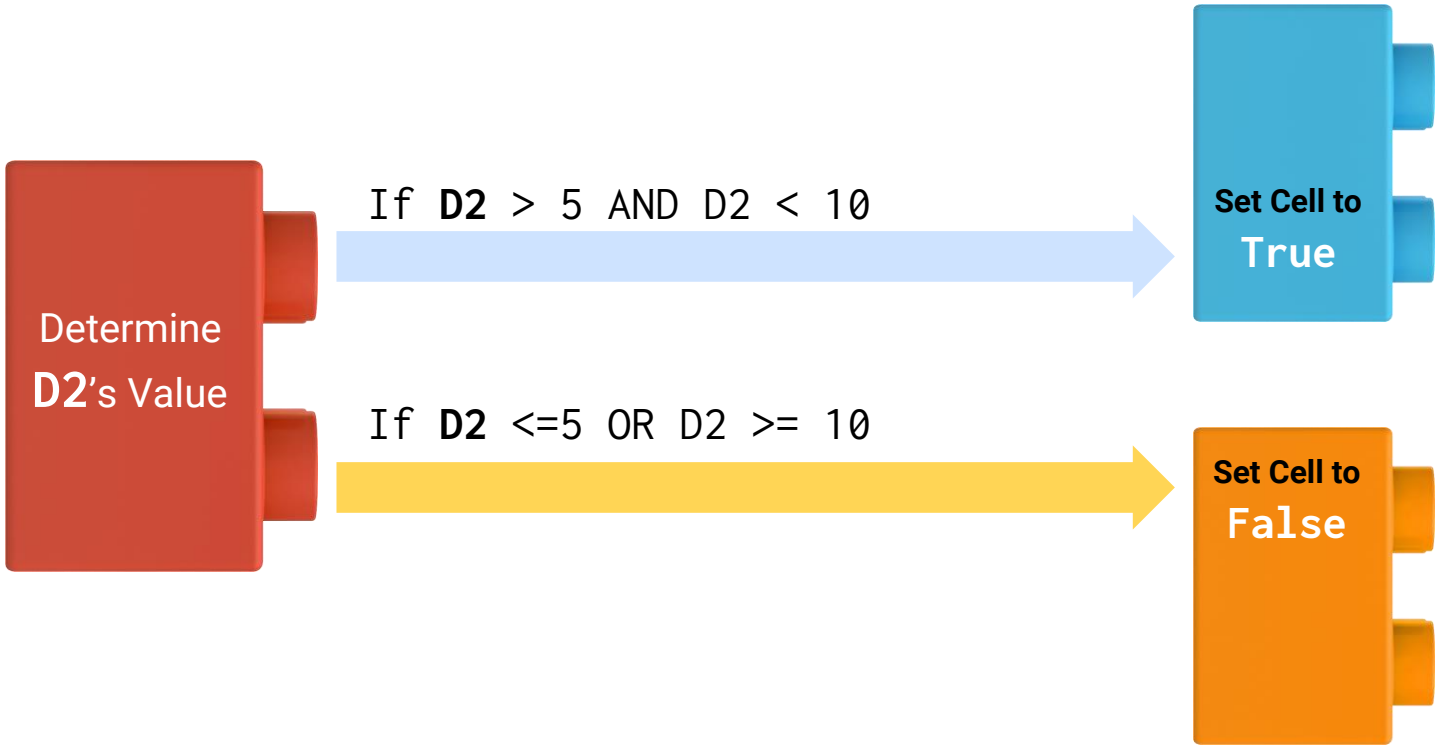
But what if we want
to **combine** conditions?

AND, NOT, OR

```
=IF(AND(D2>5, D2<10),TRUE,FALSE)
```

Conditionals: If This, Then That

Nesting conditionals are powerful, but can become convoluted very quickly!



Time to <code>

Activity: Gradebook

Create a formula that calculates the final grade for a student based on their previous exams and papers.

Suggested Time:

15 minutes

Activity: Gradebook

To do	• Create a formula which calculates the final grade for a student based upon their previous exams and papers.
When making this calculation	• Consider every paper and exam to be equal in weight; each should comprise one-fourth of the overall grade. • Round the result to the nearest integer. • Using conditionals, create a formula that returns `PASS` if a student's final grade is greater than or equal to 60. If a student's final grade is below 60, the formula should return `FAIL`.
Bonus	Create a nested `IF()` formula that returns a letter grade based on a student's final grade. • Greater than or equal to 90 = A • Greater than or equal to 80 and less than 90 = B • Greater than or equal to 70 and less than 80 = C • Greater than or equal to 60 and less than 70 = D • Anything less than 60 = F

Time's Up! Let's Review.

Instructor Demonstration

Measures of Central Tendency

What are “measures of central tendency”?

Values used to describe the center of a data set.

Central Tendency

Three most common measures of central tendency:

Mean

The “arithmetic” average

To calculate: The sum of all values, divided by the number of values

Median

The middle value of a data set

To calculate: Sort the data set and find the center

Mode

The most frequent value of a data set

To calculate: Count the frequency of each value in a data set, determine the most frequent value

Time to <code>


Break

Instructor Demonstration

Formatting

Formatting in Excel falls into two categories

Data Formatting

- Changes the way a value is represented in a cell.
- Used to help with interpretation or to add context to the range of values

Examples

- Date and Time
- Currency
- Percentage

Style Formatting

- Changes the way the cell and text are viewed
- Can include font color, cell highlighting, borders, etc.
- Can be performed manually or using formulas/logic (conditional formatting)

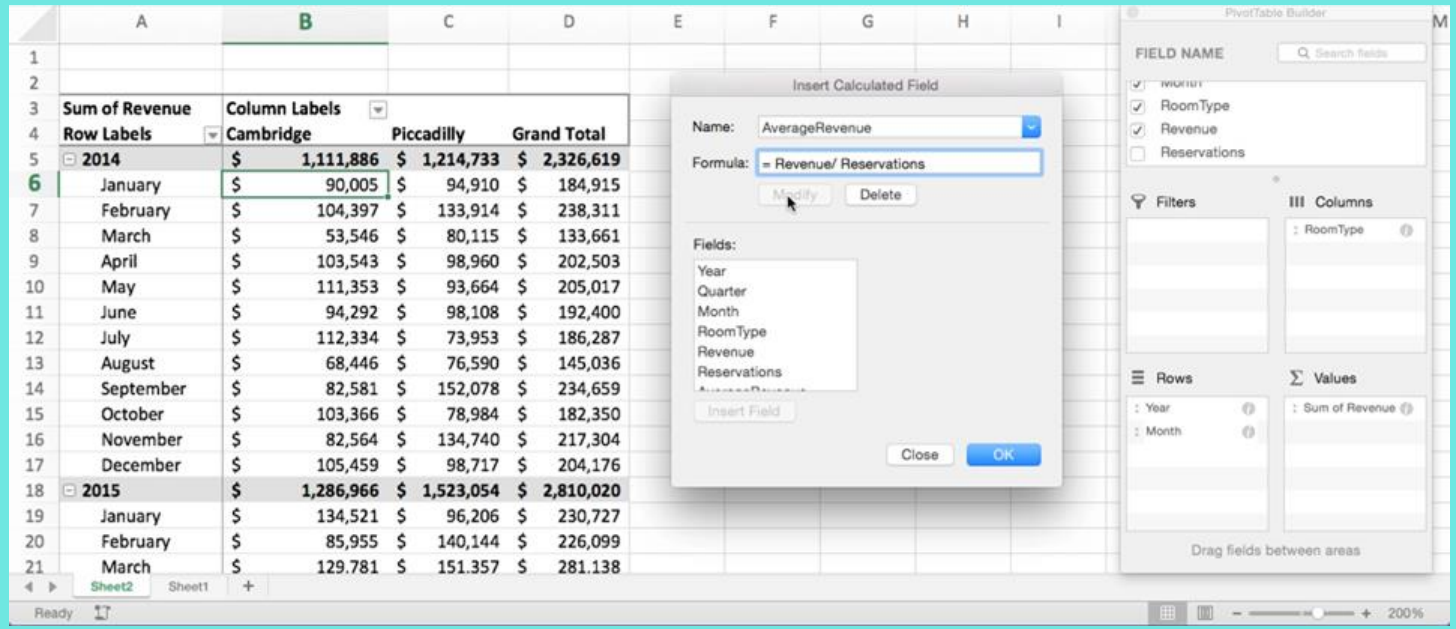
Time to <code>

Instructor Demonstration

Pivot Tables

Get Pivot With It

Pivot tables are one of the most important data visualization concepts to master in this class. (Don’t worry. They are a cinch to deal with.)



Get Pivot With It

In essence, a pivot table is a **summative** analytic tool that allows us to perform aggregate functions that allow any combination of fields. (The term *pivot table* comes from the fact that we are pivoting along a data axis).

Seller	Qty. Sold	Date
Joseph	$42.50	1/1/17
Jacob	$65.00	1/3/17
Jacob	$5.25	1/6/17
Joseph	$125.00	1/6/17
Jacob	$3.50	1/7/17
Matt	$32.00	1/9/17

Seller	Total Sold
Joseph	$167.50
Jacob	$73.75
Matt	$32.00

Word to the Wise: Keep It Flat!

Modern Business Intelligence (BI) tools like Tableau, Sisense, and Salesforce work best if data is stored in flat CSVs—meaning column headers represent fields (vertically) on the spreadsheet. This is largely because all of these technologies heavily utilize pivot tables as a tool for their visualizations. **Don't try to confuse this simplicity. "Spreadsheet magic" is a nightmare to analyze.**

B	C	D	E	F	G	H
DateTime	Week #	Section?	Pace	Academic Support	Self-Mastery	Instructor Er
2016-09-11T04:00:00.000Z	18	RCB0503FSF - CCC	3	5	5	4
2016-09-11T05:00:00.000Z	6	UT0726FSF	3	5	3	4
2016-09-12T04:00:00.000Z	11	UCF062016FSF	4	4	3	5
2016-09-12T04:00:00.000Z	23	UCF0329FSF	2	4	5	1
2016-09-12T04:00:00.000Z	9	UNC0712FSF	3	4	4	3
2016-09-12T04:00:00.000Z	23	UCF0328FSF	4	3	2	3
2016-09-12T04:00:00.000Z	6	RUT0725FSF-NB	5	4	4	5
2016-09-12T04:00:00.000Z	6	RUT0725FSF-NB	5	5	4	5
2016-09-12T04:00:00.000Z	6	RUT0725FSF-NB	2	4	4	4
2016-09-12T04:00:00.000Z	11	UCF062016FSF	4	5	4	5
2016-09-12T04:00:00.000Z	13	UCF061416FSF	4	5	1	5

Time to <code>

Activity: Top Songs Pivot Table

In this activity, you will use a 5000 row spreadsheet containing data for the top 5000 songs from 1901 onward. Using pivot tables, you will uncover which artists have the most songs in the top 5000, the song titles, and the year each song was released.

Suggested Time:

17 minutes

Top Songs Pivot Table Instructions

- Select all of the data in your worksheet and create a new pivot table.
- Make a pivot table that can be filtered by year and contains two rows: *Artist* and *Name*.
- All of an artist's songs should be listed below their name.

Update your pivot table to contain values for:

- How many songs an artist has in the top 5000
- The sum of the `final_score` of their songs.

- Sort your pivot table by descending sum of the `final_score`.

Time's Up! Let's Review.

Instructor Demonstration

Lookups

Look It Up with Lookups

Assume this table is gigantic. How would we **retrieve** the population of a specific planet for use in another formula?

Planet	Population
Zeelo	5020
Merinoa	380
Cardboard Box	2
…	…
Asteroid 9	95

Look It Up with Lookups

Assume this table is gigantic. How would we **retrieve** the population of a specific planet for use in another formula?


```
=vlookup( <value>, <full table>,
<column to retrieve>,<match parameter>)
```

Planet	Population
Zeelo	5020
Merinoa	380
Cardboard Box	2
…	…
Asteroid 9	95

Look It Up with Lookups

What will this yield?

`=vlookup( “Asteroid 9”, Planets, 3, FALSE)`

Planet	Population	Species
Zeelo	5020	Zoltans
Merinoa	380	Murphies
Cardboard Box	2	Hambones
…	…	
Asteroid 9	95	Asterisks

Look It Up with Lookups

What will this yield?

```
=vlookup( “Asteroid 9”, Planets, 3, FALSE)
```

Planet	Population	Species
Zeelo	5020	Zoltans
Merinoa	380	Murphies
Cardboard Box	2	Hambones
…	…	
Asteroid 9	95	Asterisks

Time to <code>

Partner Activity: Product Pivot

An independent artist who sells their designs on products in an online store has called upon the class to create a table which visualizes the cost of their recent orders. Using lookups, create a pivot table which serves this purpose.

Suggested Time:

15 minutes

Partner Activity: Product Pivot

Determine the "Product Price" of each row in the "Orders" sheet by using a `VLOOKUP()` that references each row's "Product ID"

The "Product Price" of a row does not include shipping

Determine the "Shipping Price" of each row in the "Orders" sheet by using a `VLOOKUP()` that references each row's "Shipping Priority"

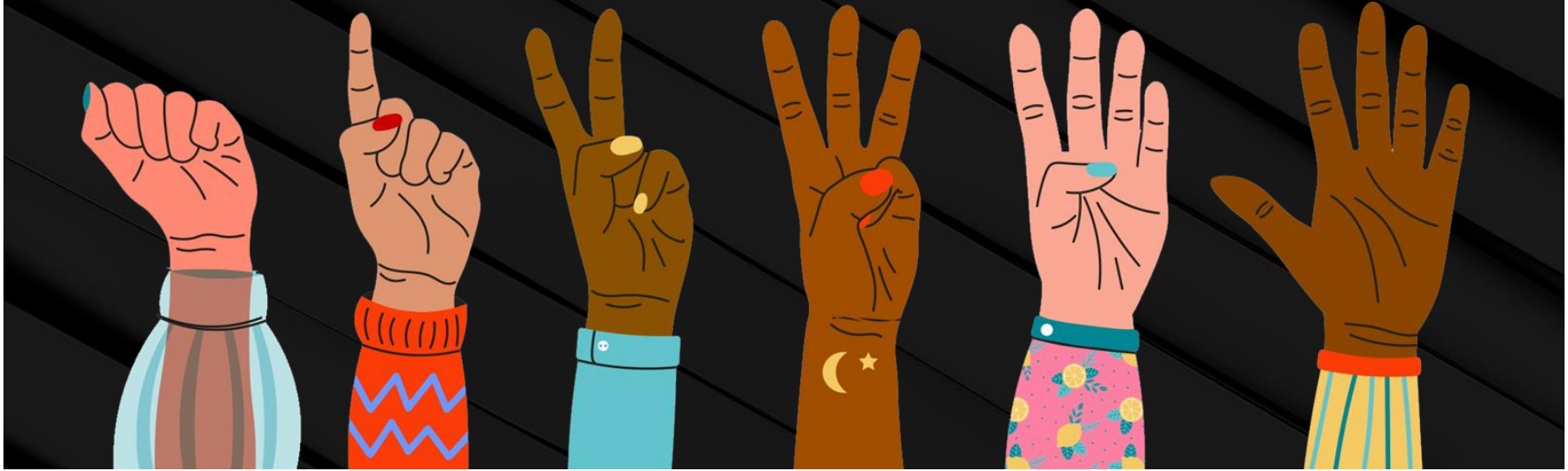
Select all of the data on the "Orders" sheet and create a new pivot table that calculates the sum of both "Product Price" and "Shipping Price" for each "Order Number" and "Product ID"

Time's Up! Let's Review.

Questions?

FIST TO FIVE:

Who feels comfortable with pivot tables in Excel?



FIST TO FIVE:

Who feels comfortable with the Measures of Central Tendency?