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Transform Data Sets

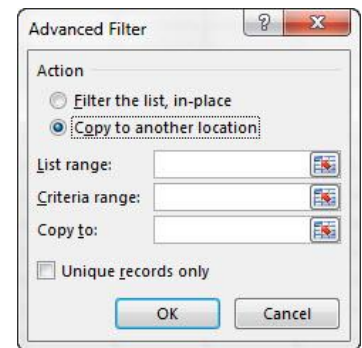
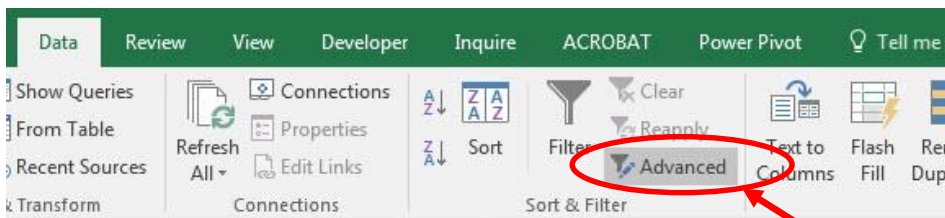
- 1) Fix unusable data set so that it can be used to perform data analysis.
- 2) Examples in this video:
 - Using Advanced Filter we will see various examples of how to:
 1. Extract records from a data set based on criteria
 2. Extract only certain columns from a data set
 3. Create final table reports from large data sets.

Advanced Filter for Data Set Transformation

- 1) What Advanced Filter Does:
 - Advanced Filter is useful when you have complex criteria and you want to extract records and fields from a Proper Data Set and you do not need it to update upon refresh.
 - Transforms larger Proper Data Sets into smaller Proper Data Sets by extracting:
 1. Specified fields (columns)
 2. Specified records based on criteria
- 2) How is it different than the Filter feature?
 - Is different than the Filter feature because it allows you to place the specified criteria in the cells on the worksheet, rather than hidden behind a Filter drop-down list.
 - With Advanced Filter, you can paste the extracted records to a new location.
- 3) How is it different than Power Query?
 - Is different than Power Query in that it does not automatically update when you click the Refresh button.
 - Advanced Filter does not have as many features as Power Query (not even close!).
- 4) When to NOT use Advanced Filter:
 - If you have only a few criteria for extracting records from a data set, you the Filter Feature.
 - If you want the process to update when you click refresh use Power Query.
- 5) When to use Advanced Filter:
 - You have complex criteria
 - You want to see the criteria on the face of the spreadsheet (different than Filter)
 - You don't need process linked to source data.
 - There are some specific great uses for Advanced Filter like: 1) Converting text numbers back to numbers, or 2) Converting text dates into serial number dates, 3) one-time record extraction with complex criteria.

Advanced Filter button in Data Ribbon Tab:

- 1) Data Ribbon Tab, Sort & Filter group, Advanced button



Advanced Filter Dialog Box:

- 1) **Action:** Copy to another location.
- 2) **List range:** Proper Data Set. Can be all fields, or just some of the fields.
- 3) **Criteria range:** must be cells with field names and criteria below. AND Criteria on same row. OR Criteria on different rows.
- 4) **Copy to:** Horizontal list of Field Names that represent the Fields you want to extract. Field Names must be spelled the same as Fields in Proper Data Set. Note: if you do not list Field Names and select one empty cell, Advanced Filter will extract records for all Fields.
- 5) **Unique records only:** Used to extract a unique list.
 - Can be used on a single column or multiple columns.
 - Can be used with Criteria or without. (Be sure to have Field Names in Proper Data Set (List range); if you do not you will get 1 duplicate because it treats the first item as a Field Name.)

Notes about: List range (Data Set Area)

- 1) Must have Proper Data Set.

Notes about: Advanced Filter Criteria range (Criteria Area)

- 2) Criteria Area:

- Work the same way as D Functions (Video #6).
- Field Names must be above criteria.
 1. Field Names must be spelled the same as Fields in Proper Data Set.
- Must include criteria in cell and Comparative Operator (for equal sign use lead apostrophe, like: '=West').
- If you do not use a comparative operator, like typing just West, you are telling the D Functions to use "Contains" Criteria (Sometimes called "Partial Text" Criteria). This means that the Criteria "West" would find "West" or "NorthWest" or "Western" and so on.
- AND Criteria is listed in same row.
- OR Criteria is listed on different rows.
- If you are applying AND Criteria to a single field, repeat the Field Names.
- If you have a Helper Column in your data set with a TRUE or FALSE Logical Formula, you can use the formula from the first cell in the Helper Column in the Criteria area with a single cell above it (empty or with a name) and then delete the helper column. Advanced Filter will copy the formula down the data set, in memory, and extract records only when it evaluates the formula to a TRUE. This method DOES NOT require that the helper column is actually in the data set. This method can be used when the helper column is not allowed in the data set for various reasons.

- 3) Example of AND Criteria:

- This example uses the AND Criteria on the same row:
- We are looking for records that have a Date \geq 10/1/2016 **AND** a Date \leq 3/31/2017 **AND** a Customer =Amazon

Criteria Area:			
Date	Date	Customer	
\geq 10/1/2016	\leq 3/31/2017	=Amazon	

- 4) Example of OR Criteria:

- This example uses OR Criteria on different rows:
- We are looking for records that have the Customer =Amazon **OR** Customer =Google

Criteria Area:	
Customer	
=Amazon	
=Google	

5) Example of "Contains Criteria":

- This example uses "Contains Criteria". By not including the comparative operator "=" (equal sign), Advanced Filter will find an item in the Field Region that contains: "West".
- For our data set Advanced Filter will find the records when the Region Field contains "West" or "MidWest".

Criteria Area:	
Region	
West	

6) Example of AND and OR Criteria:

- This example uses AND and OR Criteria:
- Advanced Filter will find the records that have "Date in 1st quarter of 2017 **AND** SalesRep =Gigi **AND** Customer =Amazon" **OR** "Date in 1st quarter of 2017 **AND** SalesRep =Gigi **AND** Customer =OD"

Criteria Area:			
Date	Date	SalesRep	Customer
>=1/1/2017	<=3/31/2017	=Gigi	=Amazon
>=1/1/2017	<=3/31/2017	=Gigi	=OD

7) Example of Formula Criteria:

- This example uses a formula that evaluates to TRUE or FALSE as its criteria.
- If you have a Helper Column in your data set with TRUE or FALSE Logical Formula, you can use the formula from the first cell in the Helper Column in the Criteria area with a single cell above it (empty or with a name) and then delete the helper column. Advanced Filter will copy the formula down the data set, in memory, and extract records only when it evaluates the formula to a TRUE. This method DOES NOT require that the helper column is actually in the data set. This method can be used when the helper column is not allowed in the data set for various reasons.
- See example 8 later in this handout or in the video.

	A	B	C	D	E	F	G
1		Criteria:					
2							
3		Helper 1					
4		=AND('AF(7) DataSet'!E11="Gross Domestic Product (GDP)",ISNUMBER(SEARCH('AF(7) DataSet'!D11,'AF(7) DataSet'!\$A\$4)))					
5		AND(logical1, [logical2], [logical3], ...)					
6		Extract:					
7							
8		GDP/breakdown at constant 2005 prices in US Dollars in (all countries) in millions					
9							
10		Country	2000	2001	2002	2003	

Notes about: Copy to (Extract Area)

- 1) Don't keep any data below extract area. Because each time you run Advanced Filter, it deletes anything below the Extract Area.
- 2) By listing Field Names in Extract Area, you tell Advanced Filter which columns to extract. These Field Names are the criteria for extracting only certain fields/columns.

Example 1: Extract Records based on AND Logical Test (AND Criteria)

- 1) Our Goal is to extract records and fields with this criteria:
 - Records that match this Criteria: Date >=10/1/2016 **AND** Date <=3/31/2017 **AND** Customer =Amazon
 - The following 3 Fields: Region, Product, Sales
- 2) Must set up three areas:
 1. List range (Data Set area):
Must have Proper Data Set.
 2. Criteria range (Criteria area):
Field Names above criteria.
Criteria below Field Names:
AND Criteria in same row (same line)
 3. Copy to (Extract Area):
Don't keep any data below extract area. Because each time you run Advanced Filter, it deletes anything below the Extract Area.
By listing Field Names in Extract Area, you tell Advanced Filter which columns to extract. These Field Names are the criteria for extracting only certain fields/columns.
- 3) Click in one cell in Proper Data Set: Advanced Filter keyboard: Alt, A, Q or Alt, D, F, A
- 4) Advanced Filter Dialog Box:
 - **Action:** Copy to another location
 - **List range:** Select Proper Data Set.
 - **Criteria range:** Must be cells with field names and criteria below. In our example we have the criteria "Date >=10/1/2016 **AND** Date <=3/31/2017 **AND** Customer =Amazon".
 - **Copy to:** Horizontal list of Field Names that represent the Fields you want to extract.

5) Example:

Data Set area:

Date	Region	SalesRep	Customer	Product	COGS	Sales
10/7/17	West	Gigi	Amazon	AIM Item	3,643	6,279
8/3/16	South	Gigi	Fred Myer	DAB Item	8,815	9,428
10/26/16	South	Mo	Peet's	XOL Item	3,190	7,417
5/20/16	South	Pham	HD	RAD Item	3,636	6,270
3/4/17	South	Gigi	HD	DAB Item	5,247	5,610
9/24/16	West	Gigi	McLendon's	RAD Item	2,984	5,424
1/14/17	South	Shelia	Fred Myer	XOL Item	6,386	6,830
4/3/16	West	Mo	HD	RAD Item	1,175	2,611
1/20/17	MidWest	Gigi	Costco	DAB Item	2,792	4,811
2/26/16	South	Mo	OD	XOL Item	16	23
12/16/17	North	Pham	Economist	DAB Item	7,222	8,206
4/5/16	North	Pham				
6/24/16	West	Mo				
8/22/17	MidWest	Gigi				
11/9/17	North	Pham				
3/23/17	North					
10/3/16	South					
4/4/17	West					
1/5/16	MidWest					
11/6/17	North					
9/25/17	North	Gigi	HD	AIM Item	1,504	2,006
11/12/17	South	Gigi	Economist	AIM Item	3,506	8,151
12/7/16	MidWest	Gigi	OD	XOL Item	3,847	6,993
11/5/17	South	Shelia	DEC	AIM Item	2,510	5,929

Our Goal is to extract records and fields with this criteria:

- 1) Records that match this Criteria: Date >=10/1/2016 AND Date <=3/31/2017 AND Customer =Amazon
- 2) The following 3 Fields: Region, Product, Sales

Criteria Area:

Date	Date	Customer
>=10/1/2016	<=3/31/2017	=Amazon

Remember from D Functions (Video #6):
AND Criteria on same row

Extract Area:

Region	Product	Sales
Total Sales		\$150,051

Formula in O28: =DSUM(A18:G2017,"Sales",I22:K23)

Advanced Filter

Action:

- ☐ Filter the list, in-place
- ☒ Copy to another location

List range: \$A\$18:\$G\$2017

Criteria range: 'AF(1)!'\$I\$22:\$K\$23

Copy to: 'AF(1)!'\$I\$28:\$K\$28

☐ Unique records only

OK Cancel

Proper Data Set.

Field Names Listed in Extract Area tell Advanced Filter which columns to extract.

1. Field Names Above Criteria.
2. AND Criteria on same row.
3. Repeat Field Names if necessary.

6) Extracted Fields and Records (just the first few records shown):

Extract Area:		
Region	Product	Sales
MidWest	AIM Item	619
MidWest	AIM Item	5,885
MidWest	XOL Item	2,255
South	DAB Item	6,671
West	DAB Item	6,274
South	AIM Item	3,028
North	AIM Item	5,500
South	RAD Item	2,302

7) When you run Advanced Filter, two Defined Names are created: Extract and Criteria. This is so Advanced Filter can remember for next time.

Name	Value	Refers To	Scope	Comment
Criteria	{ "Date", "Date", "Custo...	= 'AF(1)!'\$I\$22:\$K\$23	AF(1)	
Extract	{ "Region", "Product", "...	= 'AF(1)!'\$I\$28:\$K\$28	AF(1)	

- 8) If we run Advanced Filter again with different criteria, Advanced Filter will clear the area below the Field Names in the Extract Area and then paste the new Extracted Fields and Records:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R			
16	Data Set area:								Our Goal is to extract records and fields with this criteria:												
17									1) Records that match this Criteria: Date >=3/1/2017 AND Date <=3/31/2017 AND Customer =Amazon												
18	Date	Region	SalesRep	Customer	Product	COGS	Sales		2) The following 3 Fields: Region, Product, Sales												
19	10/7/17	West	Gigi	Amazon	AIM Item	3,643	6,279														
20	8/3/16	South	Gigi	Fred Myer	DAB Item	8,815	9,428		Criteria Area:												
21	10/26/16	South	Mo	Peet's	XOL Item	3,190	7,417														
22	5/20/16	South	Pham	HD	RAD Item	3,636	6,270		Date	Date	Customer		Remember from D Functions (Video #6): AND Criteria on same row								
23	3/4/17	South	Gigi	HD	DAB Item	5,247	5,610		>=3/1/2017	<=3/31/2017	=Amazon										
24	9/24/16	West	Gigi	McLendon's	RAD Item	2,984	5,424														
25	1/14/17	South	Shelia	Fred Myer	XOL Item	6,386	6,830														
26	4/3/16	West	Mo	HD	RAD Item	1,175	2,611		Extract Area:										Remember D Functions:		
27	1/20/17	MidWest	Gigi	Costco	DAB Item	2,792	4,811														
28	2/26/16	South	Mo	OD	XOL Item	16	23		Region	Product	Sales		Total Sales \$13,145								
29	12/16/17	North	Pham	Economist	DAB Item	7,222	8,206		South	AIM Item	3,028		Formula in O28: =DSUM(A18:G2017,"Sales",I22:K23)								
30	4/5/16	North	Pham	HD	AIM Item	4,648	8,450		West	XOL Item	4,478										
31	6/24/16	West	Mo	McLendon's	RAD Item	1,264	2,144		North	AIM Item	2,058										
32	8/22/17	MidWest	Gigi	Peet's	RAD Item	3,607	6,113		West	AIM Item	3,581										
33	11/9/17	North	Pham	Peet's	AIM Item	201	273														

Example 2: Extract Records based on OR Logical Test (OR Criteria)

Data Set area:

Date	Region	SalesRep	Customer	Product	COGS	Sales
10/7/17	West	Gigi	Amazon	AIM Item	3,643	6,279
8/3/16	South	Gigi	Fred Myer	DAB Item	8,815	9,428
10/26/16	South	Mo	Peet's	XOL Item	3,190	7,417
5/20/16	South	Pham	HD	RAD Item	3,636	6,270
3/4/17	South	Gigi	HD	DAB Item	5,247	5,610
9/24/16	West	Gigi	McLendon's	RAD Item	2,984	5,424
1/14/17	South	Shelia	Fred Myer	XOL Item	6,386	6,830
4/3/16	West	Mo	HD	RAD Item	1,175	2,611
1/20/17	MidWest	Gigi	Costco	DAB Item	2,792	4,811
2/26/16	South	Mo	OD	XOL Item	16	23
12/16/17	North	Pham	Economist	DAB Item	7,222	8,206
4/5/16	North	Pham	HD	AIM Item	4,649	8,450
6/24/16	West	Mo	McLendon's	XOL Item	2,144	6,213
8/22/17	MidWest	Gigi	Peet's	AIM Item	204	278
11/9/17	North	Pham	Peet's	AIM Item	204	278
3/23/17	North	Mo	OD	DAB Item	944	2,553
10/3/16	South	Shelia	Economist	AIM Item	9,190	9,830
4/4/17	West	Mo	QFC	DAB Item	3,919	4,453
1/5/16	MidWest	Shelia	Peet's	XOL Item	2,045	5,000
11/6/17	North	Mo	Peet's	XOL Item	1,025	2,000
9/25/17	North	Gigi	Peet's	XOL Item	2,000	8,151
11/12/17	South	Gigi	Peet's	XOL Item	8,151	6,993
12/7/16	MidWest	Gigi	Peet's	XOL Item	6,993	

Our Goal is to extract records and fields with this criteria:

- Records that match this Criteria: Customer =Amazon OR Customer =Google
- The following 3 Fields: Date, Product, Sales

Criteria Area:

Customer
=Amazon
=Google

Remember from D Functions (Video #6):
OR Criteria on different rows

Extract Area:

Date	Product	Sales

Remember D Functions:

Total Sales 1613391

Formula in O28: =DSUM(A18:G2017,"Sales",I22:I24)

Advanced Filter

Action:

- ☐ Filter the list, in-place
- ☒ Copy to another location

List range: \$A\$18:\$G\$2017

Criteria range: 'AF(2)':'IS\$22:\$IS\$24

Copy to: 'AF(2)':'IS\$28:\$KS\$28

☐ Unique records only

OK Cancel

Proper Data Set.

Field Names Listed in Extract Area tell Advanced Filter which columns to extract.

1. Field Names Above Criteria.
2. OR Criteria on different rows.

Extracted Fields and Records (just the first few records shown):

Extract Area:		
Date	Product	Sales
10/7/17	AIM Item	6,279
5/19/17	XOL Item	4,314
12/29/16	AIM Item	619
9/18/16	RAD Item	659
10/21/17	RAD Item	9,196
12/14/16	XOL Item	2,204
4/1/16	RAD Item	6,453

Example 3: Extract Records based on “Contains” Criteria (“Partial Text” Criteria)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
16	Data Set area:								Our Goal is to extract records and fields with this criteria:								
17									1) Records that match this Criteria: Dates that are >=1/1/2017 AND <=1/4/2017 AND any Region that contains: West								
18	Date	Region	SalesRep	Customer	Product	COGS	Sales		2) The following 2 Fields: Date, Sales								
19	10/7/17	West	Gigi	Amazon	AIM Item	3,643	6,279										
20	8/3/16	South	Gigi	Fred Myer	DAB Item	8,815	9,428		Criteria Area:								
21	10/26/16	South	Mo	Peet's	XOL Item	3,190	7,417										
22	5/20/16	South	Pham	HD	RAD Item	3,636	6,270		Date	Date	Region						
23	3/4/17	South	Gigi	HD	DAB Item	5,247	5,610		>=1/1/2017	<=1/4/2017	West						
24	9/24/16	West	Gigi	McLendon's	RAD Item	2,984	5,424										
25	1/14/17	South	Shelia	Fred Myer	XOL Item	6,386	6,830										
26	4/3/16	West	Mo	HD	RAD Item	1,175	2,611		Extract Area:								
27	1/20/17	MidWest	Gigi	Costco	DAB Item	2,792	4,811		Date	Sales							
28	2/26/16	South	Mo	OD	XOL Item	16	23										
29	12/16/17	North	Pham	Economist	DAB Item	7,222	8,206										
30	4/5/16	North	Pham	HD	AIM Item	4,648	8,450										
31	6/24/16	West	Mo	McLendon's	RAD Item	2,984	5,424										
32	8/22/17	MidWest	Gigi	Peet's	XOL Item	3,190	7,417										
33	11/9/17	North	Pham	Peet's	AIM Item	204	273										
34	3/23/17	North	Mo	OD	DAB Item	944	2,553										
35	10/3/16	South	Shelia	Economist	AIM Item	9,190	9,830										
36	4/4/17	West	Mo	HD	RAD Item	1,175	2,611										
37	1/5/16	MidWest	Shelia	QFC	AIM Item	2,510	5,838										
38	11/6/17	North	Mo	OD	DAB Item	944	2,553										
39	9/25/17	North	Gigi	Peet's	AIM Item	204	273										
40	11/12/17	South	Gigi	HD	RAD Item	3,636	6,270										
41	12/7/16	MidWest	Gigi	OD	XOL Item	3,847	6,993										
42	11/5/17	South	Shelia	QFC	AIM Item	2,510	5,838										

Remember from D Functions (Video #6):
 "Contains" Criteria occurs when you do not include the comparative operator "=" (equal sign) AND Criteria on same row

Remember D Functions:
 Total Sales 14673
 Formula in O28: =DSUM(A18:G2017,"Sales",I22:K23)

Proper Data Set.

Field Names Listed in Extract Area tell Advanced Filter which columns to extract.

1. Field Names Above Criteria.
 2. AND Criteria on same row.
 3. Contains Criteria "West".
 4. Repeat Field Names if necessary.

Extracted Fields and Records:

Extract Area:	
Date	Sales
1/1/17	2,122
1/2/17	3,586
1/2/17	1,815
1/2/17	7,150

Example 4: Advanced Filter with Complex Criteria:

Data Set area:								Criteria Area:			
Date	Region	SalesRep	Customer	Product	COGS	Sales		Date	Date	SalesRep	Customer
10/7/17	West	Gigi	Amazon	AIM Item	3,643	6,279		>=1/1/2017	<=3/31/2017	=Gigi	=Amazon
8/3/16	South	Gigi	Fred Myer	DAB Item	8,815	9,428		>=1/1/2017	<=3/31/2017	=Gigi	=OD
10/26/16	South	Mo	Peet's	XOL Item	3,190	7,417					
5/20/16	South	Pham	HD	RAD Item	3,636	6,270		Extract Area:			
3/4/17	South	Gigi	HD	DAB Item	5,247	5,610		Date	Product	Customer	COGS
9/24/16	West	Gigi	McLendon's	RAD Item	2,984	5,424					
1/14/17	South	Shelia	Fred Myer	XOL Item	6,386	6,830					
4/3/16	West	Mo	HD	RAD Item	1,175	2,611					
1/20/17	MidWest	Gigi	Costco	OD		4,811					
2/26/16	South	Mo	OD			23					
12/16/17	North	Pham	Economist	DAB Item	7,222	8,206					
4/5/16	North	Pham	HD	AIM Item	4,648	8,450					
6/24/16	West	Mo	McLendon's	RAD Item	1,264	2,144					
8/22/17	MidWest	Gigi	Peet's	RAD Item	3,607	6,117					
11/9/17	North	Pham	Peet's	AIM Item	204	278					
3/23/17	North	Mo	OD			53					
10/3/16	South	Shelia	Eco			30					
4/4/17	West	Mo	QFC			45					
1/5/16	MidWest	Shelia	Peet's			000					
11/6/17	North	Mo	OD			025					
9/25/17	North	Gigi	HD			2,006					
11/12/17	South	Gigi	Economist	AIM Item	2,504	8,151					

Remember from D Functions:
AND Criteria on same row
OR Criteria on different rows

Advanced Filter Dialog:
Action: ☒ Filter the list, in-place ☐ Copy to another location
List range: \$A\$18:\$G\$2017
Criteria range: \$I\$18:\$L\$20
Copy to: \$I\$24:\$L\$24
☐ Unique records only

Field Names Listed in Extract Area tell Advanced Filter which columns to extract.

Proper Data Set.

- Field Names Above Criteria.
- AND Criteria on same row.
- OR Criteria on different rows.
- Repeat Field Names if necessary.

Extracted Fields and Records:

Data Set area:								Criteria Area:			
Date	Region	SalesRep	Customer	Product	COGS	Sales		Date	Date	SalesRep	Customer
10/7/17	West	Gigi	Amazon	AIM Item	3,643	6,279		>=1/1/2017	<=3/31/2017	=Gigi	=Amazon
8/3/16	South	Gigi	Fred Myer	DAB Item	8,815	9,428		>=1/1/2017	<=3/31/2017	=Gigi	=OD
10/26/16	South	Mo	Peet's	XOL Item	3,190	7,417		Extract Area:			
5/20/16	South	Pham	HD	RAD Item	3,636	6,270		Date	Product	Customer	COGS
3/4/17	South	Gigi	HD	DAB Item	5,247	5,610					
9/24/16	West	Gigi	McLendon's	RAD Item	2,984	5,424					
1/14/17	South	Shelia	Fred Myer	XOL Item	6,386	6,830					
4/3/16	West	Mo	HD	RAD Item	1,175	2,611					
1/20/17	MidWest	Gigi	Costco	DAB Item	2,792	4,811					
2/26/16	South	Mo	OD	XOL Item	16	23					
12/16/17	North	Pham	Economist	DAB Item	7,222	8,206					
4/5/16	North	Pham	HD	AIM Item	4,648	8,450					
6/24/16	West	Mo	McLendon's	RAD Item	1,264	2,144					
8/22/17	MidWest	Gigi	Peet's	RAD Item	3,607	6,117					
11/9/17	North	Pham	Peet's	AIM Item	204	278					
3/23/17	North	Mo	OD			53					
10/3/16	South	Shelia	Eco			30					
4/4/17	West	Mo	QFC			45					
1/5/16	MidWest	Shelia	Peet's			000					
11/6/17	North	Mo	OD			025					
9/25/17	North	Gigi	HD			2,006					
11/12/17	South	Gigi	Economist	AIM Item	2,504	8,151					

Remember from D Functions:
AND Criteria on same row
OR Criteria on different rows

Example 5: Advanced Filter to get a Unique List from Column

1) Advanced Filter Dialog Box:

1. **Action:** Copy to another location.
2. **List:** Because we only wanted a unique list from the Customer Field (not a unique list of records from the whole data set), we make sure to highlight the entire column, including the Field Name “Customer”.
3. **Criteria:** None for this example.
4. **Copy to:** Click in one empty cell.
5. **Unique records only:** Check the check box.

*Be sure to have Field Names in data set; if you do not you will get 1 duplicate because it will always treat the first item as a Field Name.

	A	B	C	D	E	F	G	H	I	J	K
1	Goal: Extract a Unique List of Customers										
2											
3											
4	Date	Region	SalesRep	Customer	Product	COGS	Sales				
5	10/7/17	West	Gigi	Amazon	AIM Item	3,643	6,279				
6	8/3/16	South	Gigi	Fred Myer	DAB Item	8,815	9,428				
7	10/26/16	South	Mo	Peet's	XOL Item	3,190	7,417				
8	5/20/16	South	Pham	HD	RAD Item	3,636	6,270				
9	3/4/17	South	Gigi	HD	DAB Item	5,247	5,610				
10	9/24/16	West	Gigi	McLendon's	RAD Item	2,984	5,424				
11	1/14/17	South	Shelia	Fred Myer	XOL Item	6,386	6,830				
12	4/3/16	West	Mo	HD	RAD Item	1,175	2,611				

Advanced Filter

Action

☐ Filter the list, in-place

☒ Copy to another location

List range: \$D\$4:\$D\$2003

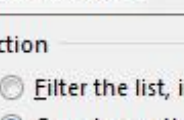
Criteria range:

Copy to: \$AF(2):\$15\$4

☒ Unique records only

OK Cancel

Result >>



Advanced Filter

Action

☐ Filter the list, in-place

☒ Copy to another location

List range: \$D\$4:\$D\$2003

Criteria range:

Copy to: '<u>'AF(2)!'\$I\$4

☒ Unique records only

OK Cancel

We highlighted only a single column (with Field Name) to get a unique list of Customer

Click in one empty cell

Check Unique Records Only

H	I	J
	Customer	
	Amazon	
	Fred Myer	
	Peet's	
	HD	
	McLendon's	
	Costco	
	OD	
	Economist	
	QFC	
	WFM	
	Yahoo	
	Google	

Example 6: Advanced Filter Extract to Different Sheet

The key is that you have to start the Advanced Filter on the sheet that you want to paste the records. Then in the List range text box, you do a Worksheet Reference. Example 6 and 8 in the video show how to do this.

Advanced Filter Extract to Different Workbook

The key is that you have to start the Advanced Filter in the workbook that you want to paste the records. Then in the List range text box, you do a Workbook Reference. No example in handout or video.

Example 7: Advanced Filter with Helper Column Formula to Create Report:

- 1) In this example, we need to extract certain records and certain fields from a very large data set that had GDP numbers.
- 2) The GDP Proper Data Set is shown below and has many hidden rows and columns (so the picture could fit on this page):
- 3) The GDP Proper Data Set has these characteristics:
 - 46 Fields.
 - 3,685 Records.
 - 154,653 numbers that represent various metrics.

	D	E	F	G	AT	AU	AV	AW
7	GDP/breakdown at constant 2005 prices in US Dollars (all countries)							
8								
9	Country	IndicatorName	1970	1971	2010	2011	2012	2013
10	Afghanistan	Final consumption expenditure	4,564,542,000	4,378,772,008	12,923,261,172	13,453,435,036	15,475,030,381	15,870,330,573
11	Afghanistan	Household consumption expenditure (including Non-profit institutions serving house	4,313,211,511	4,124,316,754	11,724,169,732	12,064,757,108	13,909,806,926	14,175,844,208
12	Afghanistan	General government final consumption expenditure	232,512,318	238,631,063	1,227,157,783	1,407,556,896	1,620,416,859	1,765,986,535
13	Afghanistan	Gross capital formation	689,789,671	735,775,649	1,371,679,395	1,391,974,664	1,281,930,401	1,246,302,358
14	Afghanistan	Gross fixed capital formation (including Acquisitions less disposals of valuables)	689,789,671	735,775,649	1,371,679,395	1,391,974,664	1,281,930,401	1,246,302,358
15	Afghanistan	Exports of goods and services	169,568,189	219,025,578	1,743,421,555	1,719,547,735	1,745,890,879	1,729,661,733
16	Afghanistan	Imports of goods and services	214,319,745	312,696,022	5,236,323,125	5,248,865,352	5,585,253,265	5,615,445,294
17	Afghanistan	Gross Domestic Product (GDP)	6,929,847,255	6,910,741,007	10,392,535,776	11,294,701,243	12,529,205,669	13,336,226,877
18	Afghanistan	Agriculture, hunting, forestry, fishing (ISIC A-B)	4,724,759,419	4,544,195,365	2,639,423,853	2,763,242,355	2,853,657,525	3,083,723,843
3685	Zimbabwe	Imports of goods and services	370490371.5	398497649.7	524276445.4	6664716377	7035240210	8489818973
3686	Zimbabwe	Gross Domestic Product (GDP)	3648163979	3968422649	9573207646	10712937097	11844780719	12375900255
3687	Zimbabwe	Agriculture, hunting, forestry, fishing (ISIC A-B)	420098314.2	533065928.2	626646033.6	635453052.4	685247375.4	667631942.7
3688	Zimbabwe	Mining, Manufacturing, Utilities (ISIC C-E)	1748406593	1844381291	3116647083	3628571587	3832741631	4019322973
3689	Zimbabwe	Manufacturing (ISIC D)	256445411.9	268442858	399643367.4	454985685.7	479305633.4	476424036.2
3690	Zimbabwe	Construction (ISIC F)	91047856.29	100716654.7	102305240.6	168908172	208597406.3	216732704.5
3691	Zimbabwe	Wholesale, retail trade, restaurants and hotels (ISIC G-H)	712377162.7	774430921.8	1579666521	1647580781	1718414865	1785972692
3692	Zimbabwe	Transport, storage and communication (ISIC I)	102475910.4	108847469.8	285939756.5	285980841.9	305118827.2	326406187.1
3693	Zimbabwe	Other Activities (ISIC J-P)	623085899.2	655388222.1	2745436861	3342976127	4082209982	4254783313
3694	Zimbabwe	Total Value Added	3707488760	4108653436	8113117762	9087324865	10047079054	10422229502
3695								

- 4) Our Goal is to extract records and fields with this criteria:

1. Only records with "Gross Domestic Product (GDP)" from IndicatorName Field
2. From the Country Column we need these countries:
 - i. Argentina, Belgium, Brazil, Canada, Finland, France, Germany, Greece, Greenland, Ireland, Italy, Luxembourg, Mexico, Norway, Panama, Peru, Poland, Portugal, Saudi Arabia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Arab Emirates, United Kingdom, United States, Venezuela.
3. We need the Fields (Years):
 - i. 2000 - 2010

- 5) Helper column formula to check if "Gross Domestic Product (GDP)" is in the IndicatorName Field AND if the country in the Country Field is in the list of countries required for the report:

	A	B	C	D	E
1	Our Goal is to extract records and fields with this criteria:				
2	1) Only records with "Gross Domestic Product (GDP)" from IndicatorName Field				
3	2) From the Country Column we need these countries:				
4	Argentina, Belgium, Brazil, Canada, Finland, France, Germany, Greece, Greenland, Ireland, Italy, Luxembourg, Mexico, Norway, Panama, Peru, Polar				
5	3) We need the Fields (Years):				
6	2000 - 2010				
7					
8	GDP/breakdown at constant 2005 prices in US Dollars				
9					
10	Helper 1	Helper 2	Helper 3	Country	IndicatorName
11	=AND(E11="Gross Domestic Product (GDP)", ISNUMBER(SEARCH(D11,\$A\$4)))			Afghanistan	Final consumption expenditure
12	FALSE	FALSE	FALSE	Afghanistan	Household consumption expenditure (including
13	FALSE	AND(logical1, [logical2], [logical3], ...)	FALSE	Afghanistan	General government final consumption expendit

- 6) Criteria area on a new sheet:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Criteria:											
2													
3		Helper 1											
4		TRUE											
5													
6		Extract:											
7													
8		GDP/breakdown at constant 2005 prices in US Dollars in (all countries)											
9													
10		Country	2000	2001	2002	2003	2004					2009	2010
11													
12													

Advanced Filter

Action

☐ Filter the list, in-place

☒ Copy to another location

List range: 'AF(7) DataSet'!\$D\$1

Criteria range: \$B\$3:\$B\$4

Copy to: \$B\$10:\$M\$10

☐ Unique records only

OK Cancel

Proper Data Set from other sheet.

7) Extracted Records and report formatting:

GDP/breakdown at constant 2005 prices in US Dollars in (all countries) in millions

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Argentina	201,962,716	193,058,497	172,025,774	187,227,757	204,133,628	222,910,837	241,554,931	260,886,309	268,979,298	269,115,167	293,702,180
Belgium	355,035,281	358,316,769	363,904,793	367,143,188	379,752,666	386,944,983	397,122,965	409,037,977	412,937,357	402,124,203	412,181,653
Brazil	768,855,135	778,951,116	799,656,370	808,825,388	855,027,859	882,043,949	916,946,737	972,801,728	1,023,022,659	1,019,634,289	1,096,449,538
Canada	1,030,602,343	1,045,009,505	1,073,203,622	1,094,586,360	1,128,140,558	1,164,179,474	1,192,258,421	1,218,546,784	1,231,968,775	1,195,877,721	1,234,996,660
Finland	179,902,129	184,544,968	187,645,998	191,387,604	198,901,532	204,430,931	212,720,987	223,750,187	225,362,632	206,727,354	212,913,371
France	2,029,983,087	2,069,666,219	2,092,809,531	2,109,958,713	2,168,755,907	2,203,626,324	2,255,956,822	2,309,232,453	2,313,746,704	2,245,684,724	2,289,832,363
Germany	2,777,363,468	2,824,447,709	2,824,751,452	2,804,398,874	2,837,509,738	2,857,558,573	2,963,573,994	3,060,476,521	3,092,676,037	2,918,312,449	3,037,693,759
Greece	204,952,992	212,611,924	219,335,920	233,894,817	245,478,784	247,665,771	262,068,224	271,338,731	270,132,940	258,260,832	244,188,803
Greenland	1,527,406	1,546,790	1,531,768	1,525,953	1,590,986	1,650,350	1,739,062	1,798,093	1,835,279	1,822,605	1,868,796
Ireland	165,931,285	174,682,021	184,880,333	190,346,718	199,062,301	210,357,907	221,864,434	232,807,249	226,731,953	212,287,589	211,702,532
Italy	1,768,788,614	1,800,146,122	1,804,660,623	1,807,414,565	1,836,031,687	1,853,465,901	1,890,654,007	1,918,525,593	1,898,384,072	1,794,326,717	1,825,019,276
Luxembourg	31,791,026	32,426,877	33,489,156	33,887,728	35,557,131	37,023,579	38,830,772	41,340,472	41,541,934	39,326,220	41,349,425
Mexico	788,246,520	787,987,769	794,070,621	805,110,296	839,005,113	864,809,657	907,845,241	937,121,778	950,053,526	904,986,103	952,037,461
Norway	276,894,378	282,668,537	286,732,484	289,369,967	300,826,229	308,722,080	316,116,267	325,377,725	326,628,172	321,328,518	323,262,711
Panama	12,523,863	12,595,784	12,876,530	13,418,086	14,427,405	15,464,700	16,783,732	18,816,688	20,720,451	21,519,514	23,122,706
Peru	61,705,803	62,087,079	65,473,016	68,199,982	71,581,476	76,080,414	81,808,432	88,777,192	96,894,220	97,910,862	106,185,067
Poland	262,992,732	266,162,583	270,004,636	279,623,663	293,984,175	304,411,706	323,263,078	346,543,958	360,129,841	369,616,029	383,287,773
Portugal	188,974,537	192,646,904	194,127,913	192,314,402	195,798,355	197,299,657	200,363,817	205,356,894	205,766,144	199,638,277	203,428,771
Saudi Arabia	258,610,835	260,026,972	260,359,147	280,300,689	306,240,320	328,461,161	346,778,580	367,558,602	398,533,234	405,823,454	435,993,881
Slovakia	38,278,398	39,550,521	41,415,098	43,656,222	45,944,451	48,948,479	52,991,244	58,651,308	61,845,893	58,574,095	61,401,650
Slovenia	30,461,740	31,360,186	32,563,217	33,488,737	34,946,072	36,344,908	38,400,616	41,066,139	42,421,462	39,113,732	39,591,560
Spain	979,526,063	1,018,717,818	1,048,054,810	1,081,462,186	1,115,709,461	1,157,247,674	1,205,552,707	1,250,989,307	1,264,949,442	1,219,742,736	1,219,911,122
Sweden	341,717,395	347,059,840	354,256,394	362,708,031	378,378,940	389,042,906	407,281,732	421,149,467	418,803,464	397,089,932	420,871,356
Switzerland	378,377,143	383,850,698	384,401,146	384,592,234	395,525,985	407,543,294	423,897,086	441,447,918	451,500,758	441,885,485	454,938,016
Turkey	386,584,134	364,558,594	387,029,401	407,407,526	445,552,309	482,985,911	516,280,494	540,383,458	543,943,712	517,693,668	565,098,633
United Arab Emirates	139,150,824	141,065,061	144,497,703	157,214,336	172,254,287	180,617,468	198,385,313	204,702,720	211,236,447	200,161,466	203,434,947
United Kingdom	2,087,472,758	2,143,094,197	2,195,648,906	2,290,071,475	2,346,267,342	2,412,116,400	2,485,495,291	2,549,015,504	2,540,551,642	2,431,038,275	2,477,504,671
United States	11,553,315,901	11,666,074,166	11,874,444,227	12,207,733,298	12,669,887,643	13,093,720,000	13,442,886,112	13,681,970,795	13,642,075,821	13,263,436,918	13,599,255,645
Venezuela	128,278,575	132,632,652	120,887,172	111,512,010	131,903,772	145,513,490	159,878,798	173,873,915	183,050,727	177,188,888	174,550,916

Example 8: Advanced Filter with Formula Criteria on Large Data Set to Create Report:

- 1) If you have a Helper Column in your data set with TRUE or FALSE Logical Formula, you can use the formula from the first cell in the Helper Column in the Criteria area with a single cell above it (empty or with a name) and then delete the helper column. Advanced Filter will copy the formula down the data set, in memory and extract records only when it evaluates the formula to a TRUE. This method DOES NOT require that the helper column is actually in the data set. This method can be used when the helper column is not allowed in the data set for various reasons.

	A	B	C	D	E	F	G
1		Criteria:					
2							
3		Formula Criteria:					
4		=AND('AF(7) DataSet'!E11="Gross Domestic Product (GDP)",ISNUMBER(SEARCH('AF(7) DataSet'!D11,'AF(7) DataSet'!\$A\$4)))					
5							
6		Extract:					
7							
8		GDP/breakdown at constant 2005 prices in US Dollars in (all countries) in millions					
9							
10		Country	2000	2001	2002	2003	

Cumulative List of Keyboards Throughout Class:

- 1) Esc Key:
 - i. Closes Backstage View (like Print Preview).
 - ii. Closes most dialog boxes.
 - iii. If you are in Edit mode in a Cell, Esc will revert back to what you had in the cell before you put the Cell in Edit mode.
- 2) **F2 Key** = Puts formula in Edit Mode and shows the rainbow colored Range Finder.
- 3) SUM Function: **Alt + =**
- 4) **Ctrl + Shift + Arrow** = Highlight column (Current Region).
- 5) **Ctrl + Backspace** = Jumps back to Active Cell
- 6) **Ctrl + Z** = Undo.
- 7) **Ctrl + Y** = Undo the Undo.
- 8) **Ctrl + C** = Copy.
- 9) **Ctrl + X** = Cut.
- 10) **Ctrl + V** = Paste.
- 11) **Ctrl + PageDown** =expose next sheet to right.
- 12) **Ctrl + PageUp** =expose next sheet to left.
- 13) **Ctrl + 1** = Format Cells dialog box, or in a chart it opens Format Chart Element Task Pane.
- 14) **Ctrl + Arrow**: jumps to the bottom of the "**Current Region**", which means it jumps to the last cell that has data, right before the first empty cell.
- 15) **Ctrl + Home** = Go to Cell A1.
- 16) **Ctrl + End** = Go to last cell used.
- 17) Alt keyboards are keys that you hit in succession. Alt keyboards are keyboards you can teach yourself by hitting the Alt key and looking at the screen tips.
 - i. Create PivotTable dialog box: **Alt, N, V**
 - ii. Page Setup dialog box: **Alt, P, S, P**
 - iii. Keyboard to open Sort dialog box: **Alt, D, S**
- 18) **ENTER** = When you are in Edit Mode in a Cell, it will put thing in cell and move selected cell DOWN.
- 19) **CTRL + ENTER** = When you are in Edit Mode in a Cell, it will put thing in cell and keep cell selected.
- 20) **TAB** = When you are in Edit Mode in a Cell, it will put thing in cell and move selected cell RIGHT.
- 21) **SHIFT + ENTER** = When you are in Edit Mode in a Cell, it will put thing in cell and move selected cell UP.
- 22) **SHIFT + TAB** = When you are in Edit Mode in a Cell, it will put thing in cell and move selected cell LEFT.
- 23) **Ctrl + T** = Create Excel Table (with dynamic ranges) from a Proper Data Set.
 - i. Keyboard to name Excel Table: **Alt, J, T, A**
 - ii. **Tab** = Enter Row Data into an Excel Table.
- 24) **Ctrl + Shift + ~ (`)** = General Number Formatting Keyboard.
- 25) **Ctrl + ;** = Keyboard for hardcoding today's date.
- 26) **Ctrl + Shift + ;** = Keyboard for hardcoding current time.
- 27) **Arrow Key** = If you are making a formula, Arrow key will "hunt" for Cell Reference.
- 28) **Ctrl + B** = Bold the Font
- 29) **Ctrl + * (on Number Pad)** or **Ctrl + Shift + 8** = Highlight Current Table.
- 30) **Alt + Enter** = Add Manual Line Break (Word Wrap)
- 31) **Ctrl + P** = Print dialog Backstage View and Print Preview
- 32) **F4 Key** = If you are in Edit mode while making a formula AND your cursor is touching a particular Cell Reference, F4 key will toggle through the different Cell References:
 - i. **A1** = Relative
 - ii. **\$A\$1** = Absolute or "Locked"

- iii. **A\$1** = Mixed with Row Locked (Relative as you copy across the columns AND Locked as you copy down the rows)
 - iv. **\$A1** = Mixed with Column Locked (Relative as you copy down the rows AND Locked as you across the columns)
- 33) **Ctrl + Shift + 4** = Apply Currency Number Formatting
- 34) **Tab key** = When you are selecting a Function from the Function Drop-down list, you can select the function that is highlighted in blue by using the Tab key.
- 35) **F9 Key** = To evaluate just a single part of formula while you are in edit mode, highlight part of formula and hit the F9 key.
- i. If you are creating an Array Constant in your formula: Hit F9.
 - ii. If you are evaluating the formula element just to see what that part of the formula looks like,
REMEMBER: to Undo with Ctrl + Z.
- 36) **Alt, E, A, A** = Clear All (Content and Formatting)
- 37) Evaluate Formula One Step at a Time Keyboard: **Alt, M, V**
- 38) Keyboard to open Sort dialog box: **Alt, D, S**
- 39) **Ctrl + Shift + L** = Filter (or **Alt, D, F, F**) = Toggle key for Filter Drop-down Arrows
- 40) **Ctrl + N** = Open New File
- 41) **F12** = Save As (Change File Name, Location, File Type)
- 42) Import Excel Table into Power Query Editor: **Alt, A, P, T**
- 43) **Ctrl + 1 (When Chart element in selected)**: Open Task Pane for Chart Element
- 44) **F4 Key** = If you are in Edit mode while making a formula AND your cursor is touching a particular Cell Reference, F4 key will toggle through the different Cell References:
- i. **A1** = Relative
 - ii. **\$A\$1** = Absolute or "Locked"
 - iii. **A\$1** = Mixed with Row Locked (Relative as you copy across the columns AND Locked as you copy down the rows)
 - iv. **\$A1** = Mixed with Column Locked (Relative as you copy down the rows AND Locked as you across the columns)
- 45) Keyboard to open Scenario Manager = **Alt, T, E**
- 46) **Ctrl + Tab** = Toggle between Excel Workbook File Windows
- 47) **Ctrl + Shift + F3** = Create Names From Selection
- 48) **Ctrl + F3** = open Name Manager
- 49) **F3** = Paste Name or List of Names
- 50) **Alt + F4** = Close Active Window
- 51) **Window Key + Up Arrow** = Maximize Active Window
- 52) **Ctrl + Shift + Enter** = Keystroke to enter Array Formulas that: 1) have a function argument that requires it, or 2) whether or not you are entering the Resultant Array into multiple cells simultaneously.
- 53) **Ctrl + /** = Highlight current Array
- 54) Data Validation Dialog Box: **Alt, D, L**
- 55) **F11** = Create Chart on a new sheet
- 56) **Alt + F11** = Create Chart on currently selected sheet.
- 57) New Format Rule dialog box: **Alt, H, L, N**
- 58) Delete conditional Formatting Rule: **Alt, O, D, D**
- 59) Manage Rule dialog box keyboard: **Alt, O, D**
- 60) "Format values where this formula is true": **Alt, H, L, N, PageDown, Tab**
- 61) Shift + F11 = Insert a New Sheet
- 62) Ctrl + F1 = Toggle Ribbon Tabs on and off
- 63) Ctrl + Alt + F5 = Refresh All Data in Excel Workbook.

64) Zoom to Selection = **Alt, W, G**

65) Ctrl + F = Find

66) Ctrl + H = Find and Replace

New Keyboards in This Video:

67) Advanced Filter keyboard: Alt, A, Q or Alt, D, F, A