

# Microsoft Excel Level 1

By the QCL

# Before we start

1. Make sure you sign in
2. Download files from: <https://github.com/CMC-QCL/Excel-L1-Workshop>

# Agenda

1. What is Excel
2. Excel worksheet:
  - Structure
  - Today's data
3. Features/functions:
  - Sort, filter, conditional formatting
  - VLOOKUP (exact match)
  - Calculations: mean, min and max
  - Frequency and histogram
  - Pivot table and chart

# Excel

Popular  
Data entry  
Calculations  
Plots/diagrams

# Excel worksheet

Ribbon

Row

Workbook

The screenshot shows an Excel worksheet with the following data:

	A	B	C	D	E	F	G	H
1	Squad no.	Country	Pos.	Player	Age	Caps	Goals	
2	1	US	GK	Alyssa Naehar	31	43	0	
3	2	US	FW	Mallory Pugh	21	50	15	
4	3	US	MF	Sam Mewis	26	47	9	
5	4	US	DF	Becky Sauerbrunn	34	155	0	
6	5	US	DF	Kelley O'Hara	30	115	2	
7	6	US	MF	Morgan Brian	26	82	6	
8	7	US	DF	Abby Dahlkemper	26	37	0	
9	8	US	MF	Julie Ertz	27	79	18	
10	9	US	MF	Lindsey Horan	25	66	8	
11	10	US	FW	Carli Lloyd	36		107	
12	11	US	DF	Ali Krieger	34	99	1	

# Today's data

	A	B	C	D	E
1	id	country	gender	age	window
2	1	South Korea	female	62	0
3	2	Singapore	male	27	1
4	3	Taiwan	male	35	1
5	4	Hong Kong	male	43	1
6	5	China	female	32	2
7	6	China	male	44	2
8	7	Singapore	female	48	2
9	8	Germany	male	32	2
10	9	Switzerland	male	70	2
11	10	Japan	female	25	3

File **name**:

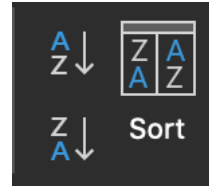
COV19\_IndividualList.xlsx

5 **fields** (column): id, country, gender, age and window (days from exposure to symptom onset)

**Total** of 1086 records (rows)

# Sort

Under **Data**, find **Sort**



Sort **country** in **alphabetical** order by highlight cell in desired column and click on



Sort **country** in **reverse alphabetical** order by highlight cell in desired and click on

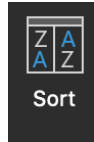


	A	B	C	D	E
1	id	country	gender	age	window
2	1083	Afghanistan	n/a	35	n/a
3	1084	Algeria	male	n/a	n/a
4	790	Australia	male	35	n/a
5	791	Australia	male	43	n/a
6	792	Australia	male	53	n/a
7	793	Australia	male	55	n/a
8	794	Australia	female	21	n/a
9	795	Australia	male	44	n/a
10	796	Australia	male	65	n/a

	A	B	C	D	E
1	id	country	gender	age	window
2	30	Vietnam	female	55	5
3	47	Vietnam	male	28	7
4	61	Vietnam	female	42	9
5	777	Vietnam	male	66	n/a
6	778	Vietnam	n/a	n/a	n/a
7	779	Vietnam	n/a	n/a	n/a
8	780	Vietnam	n/a	n/a	n/a
9	781	Vietnam	n/a	n/a	n/a
10	782	Vietnam	n/a	n/a	n/a

# Sort by conditions

Under **Data**, click on **Sort**

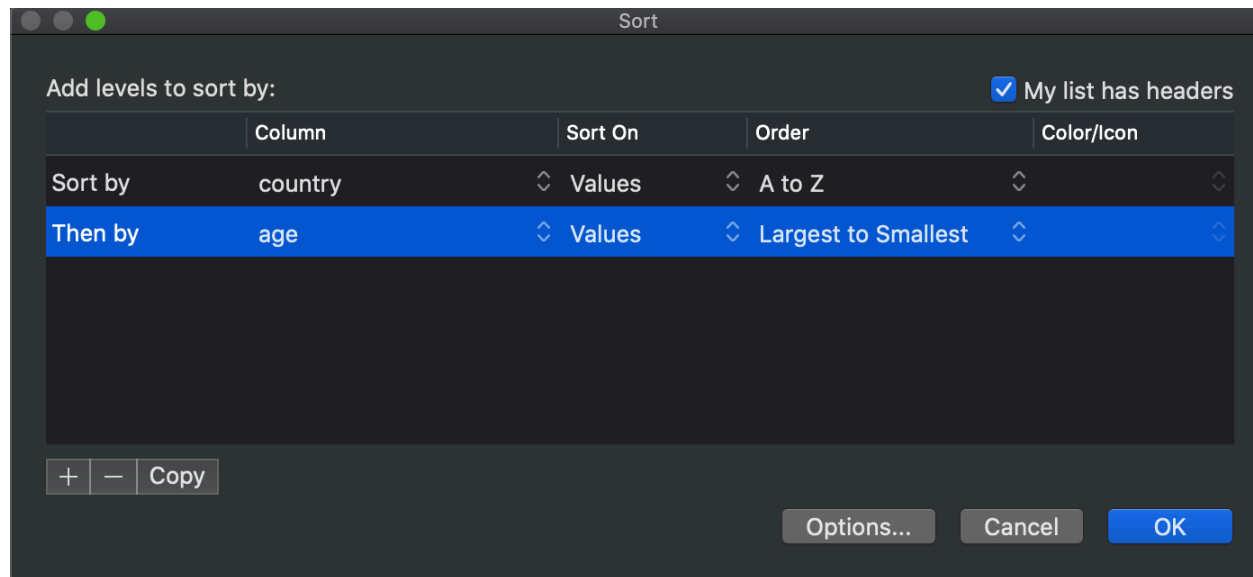


To sort **country** by alphabetical order followed by **age** in decreasing order:

Click on any cell in the column that needs to be sorted

When the Sort box opens, select **country** under Column and **A to Z** under Order

Click on “+” to add another level, select **age** under Column and **Largest to Smallest** under Order



	A	B	C	D	E
1	id	country	gender	age	window
2	1083	Afghanistan	n/a	35	n/a
3	1084	Algeria	male	n/a	n/a
4	796	Australia	male	65	n/a
5	799	Australia	male	60	n/a
6	800	Australia	female	60	n/a
7	793	Australia	male	55	n/a
8	792	Australia	male	53	n/a
9	797	Australia	female	45	n/a
10	795	Australia	male	44	n/a

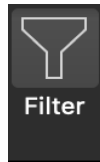


# Filter

Filter by gender (**female**) by:

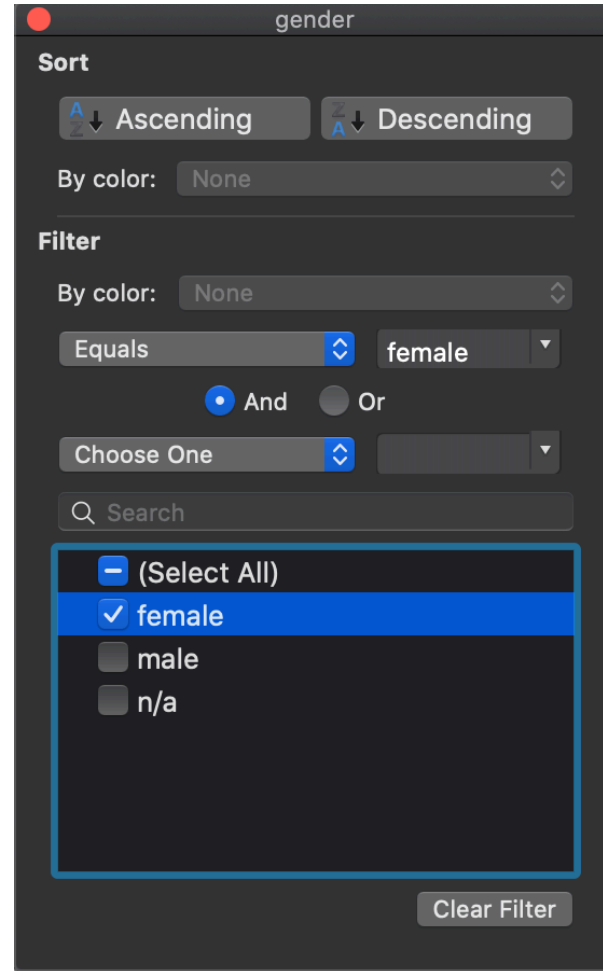
Click on any cell in the column that needs to be sorted

Under **Data**, click on **Filter**



Once the downward arrows appear, go to the **gender** column (C) and click on the **downward arrow**

When the gender **filter** window opens, uncheck **Select All** and click on **female** to display only female patients



	A	B	C	D	E
1		count	gender	age	wind
2	1	South Korea	female	62	0
6	5	China	female	32	2
8	7	Singapore	female	48	2
11	10	Japan	female	25	3
12	11	Japan	female	55	3
14	13	China	female	50	4
15	14	China	female	32	4
19	18	China	female	42	4
21	20	Singapore	female	38	4

# Conditional formatting

CDC indicated that average window is 14 days ([link](#))

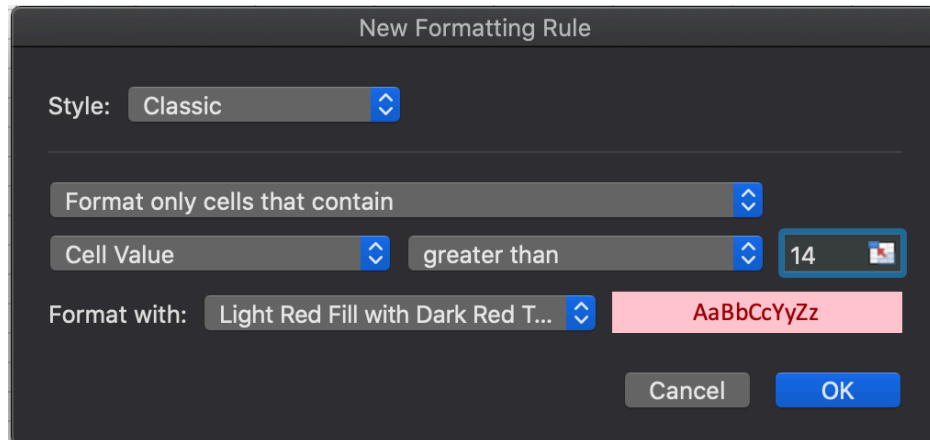
High-light the cells that are going to be subjected to condition (in this example, highlight all cells under [window](#) column or column E)

On the Home tab, click on Conditional Formatting



Click [Highlight Cells Rules, Greater Than](#)

When Greater Than window appears, enter [14](#) and select [formatting style](#)

A screenshot of the 'New Formatting Rule' dialog box in Excel. The 'Style' dropdown is set to 'Classic'. The 'Format only cells that contain' dropdown is set to 'Cell Value'. The 'greater than' operator is selected, and the value '14' is entered in the adjacent text box. The 'Format with' dropdown is set to 'Light Red Fill with Dark Red T...'. A preview of the light red fill with dark red text is shown. The 'OK' button is highlighted in blue.

	A	B	C	D	E
1	id	country	gender	age	window
72	71	Japan	female	55	12
73	72	Hong Kong	male	42	12
74	73	Hong Kong	male	52	13
75	74	Hong Kong	male	37	13
76	75	USA	male	65	15
77	76	Hong Kong	female	21	18
78	77	China	male	56	21
79	78	Malaysia	female	32	22
80	79	Hong Kong	male	16	23
81	80	Hong Kong	male	68	26
82	81	Hong Kong	female	59	30
83	82	Japan	male	55	32
84	83	Japan	male	85	34
85	84	China	female	56	n/a
86	85	China	male	46	n/a
87	86	China	female	60	n/a
88	87	China	male	58	n/a
89	88	China	female	44	n/a
90	89	China	male	34	n/a

# VLOOKUP exact match

Find the age of patient based upon ID:

Enter “Exact” in Cell G1, “ID” in Cell G2 and “Age” in Cell G3

In Cell H3, input the VLOOKUP function:  
“=VLOOKUP(H2, A1:D1086, 4, FALSE)”

- H2 - cell to enter id
- A1: D1086 - vertical search range
- #4 – column away from input column
- False – return value when true

H3          =VLOOKUP(H2, A1:D1086, 4, FALSE)								
	A	B	C	D	E	F	G	H
1	id	country	gender	age	window		Exact	
2	1	South Korea	female	62	0		ID	235
3	2	Singapore	male	27	1		Age	34
4	3	Taiwan	male	35	1			
5	4	Hong Kong	male	43	1			
6	5	China	female	32	2			
7	6	China	male	44	2			
8	7	Singapore	female	48	2			
9	8	Germany	male	32	2			
10	9	Switzerland	male	70	2			
11	10	Japan	female	25	3			

# Calculations

Find average, min and max of age by:

Enter “Age” in Cell H1, “Average” in Cell G2, “Min” in Cell G3 and “Max” in Cell G4

In Cell H2, enter “=average(D2:D1086)”

In Cell H3, enter “=min(D2:D1086)”

In Cell H4, enter “=max(D2:D1086)”

	A	B	C	D	E	F	G	H
1	id	country	gender	age	window			Age
2	1	South Korea	female	62	0		Average	49.48
3	2	Singapore	male	27	1		Min	0.25
4	3	Taiwan	male	35	1		Max	96.00
5	4	Hong Kong	male	43	1			
6	5	China	female	32	2			
7	6	China	male	44	2			
8	7	Singapore	female	48	2			
9	8	Germany	male	32	2			
10	9	Switzerland	male	70	2			

# Frequency

Determine age frequency by:

Enter “Upper bin” in Cell H1, “25” in Cell H2, “50” in Cell H3, “75” in H4 and “100” in H5

Highlight range I2:I5, enter “=FREQUENCY(D2:D1086, H2:H5)” and finish by pressing:

PC: Ctrl + Shift + Enter

Mac: Ctrl + Shift + Return (365) or Ctrl + Shift + Command (Excel 2016)

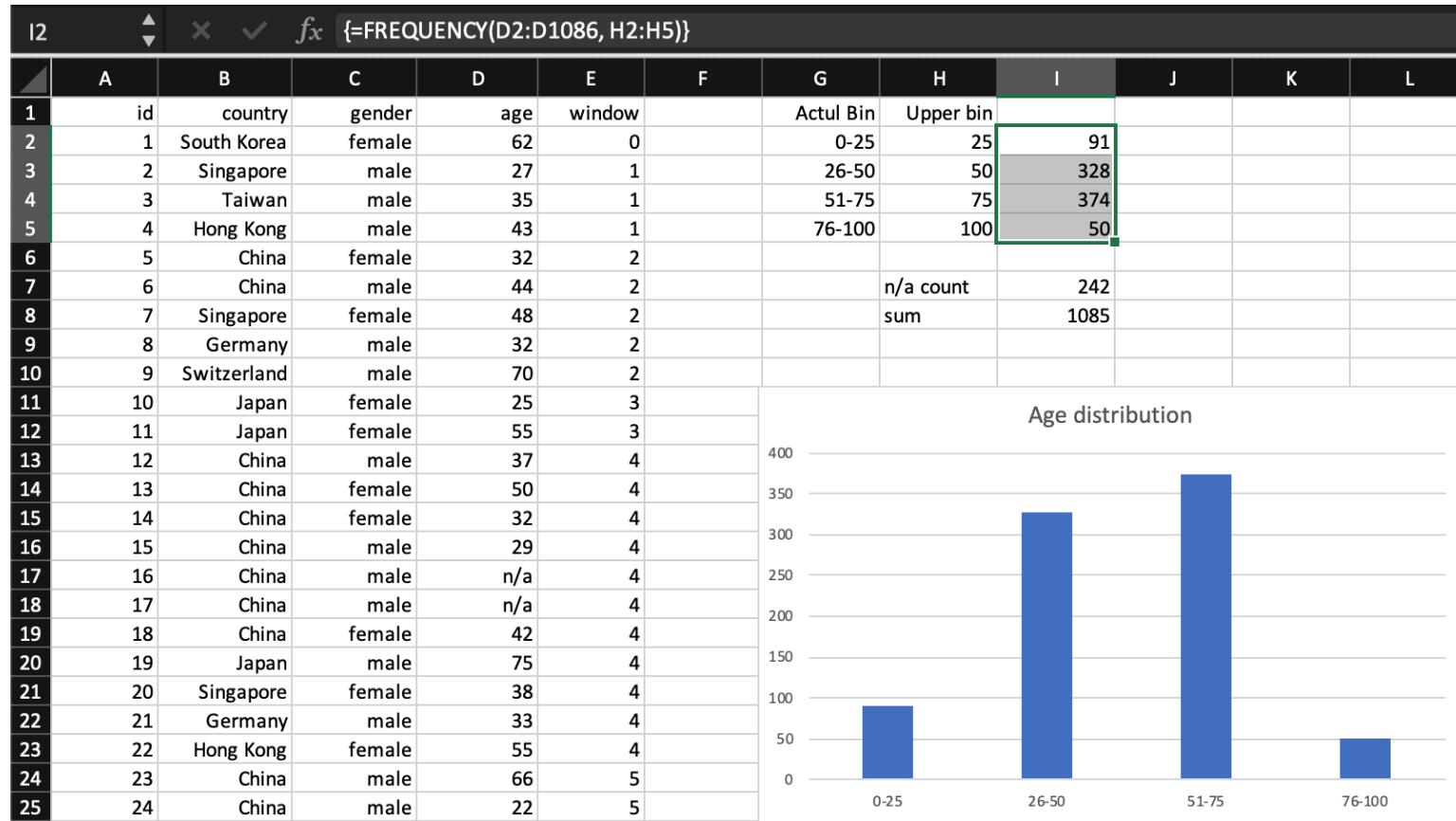
Make histogram:

Enter the Bin numbers: “0-25” in G2, “26-50” in G3, “51-75” in G4 and “76-100” in G5

Highlight Cells G2:G5 and I2:I5

Under Insert, select Column and click on Clustered Column to generate the histogram

To edit or change the design or format of the histogram, click on the histogram to turn on the Chart Tools



# Insert Pivot Table

Create Pivot table that filters by country and shows shows age by gender:

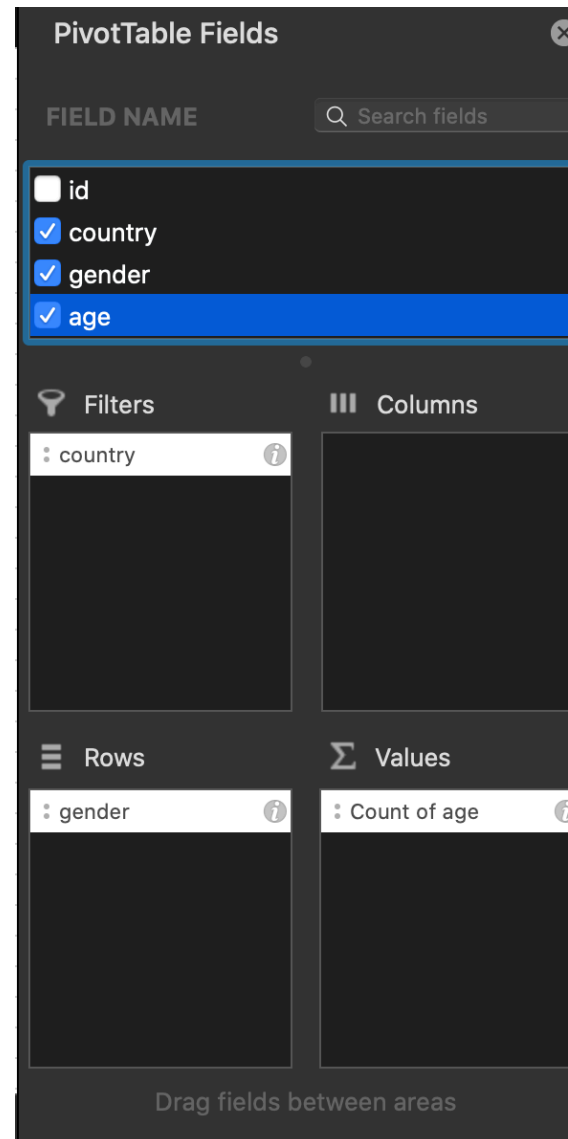
Click on any cells in the data set

Under **Insert**, select **Pivot Table**

When Create PivotTable box appears, default is new worksheet, so click **OK**

**Pivot Table Fields** pane then appear, drag the following into different areas:

- **Country** to the **Filter** area
- **Gender** to the **Rows** area
- **Age** to the **Values** area



	A	B
1	country	(All) ▼
2		
3	Row Labels ▼	Count of age
4	female	382
5	male	519
6	n/a	184
7	Grand Total	1085

# Pivot Table: summary calculation

Change summary calculation by:

Click on any cell in the Count of age Column

Change the type of calculation by [right-click](#) and select [Value Field Settings](#)

When the [PivotTable Field](#) pane opens, select [Average](#) and click [OK](#)

	A	B
1	country	(All) ▼
2		
3	Row Labels ▼	Count of age
4	female	382
5	male	519
6	n/a	184
7	Grand Total	1085

PivotTable Field

Source field: age

Field name: Average of age

Summarize by

Show data as

Sum

Count

Average

Max

Min

Product

Count Numbers

StdDev

Number...

Cancel

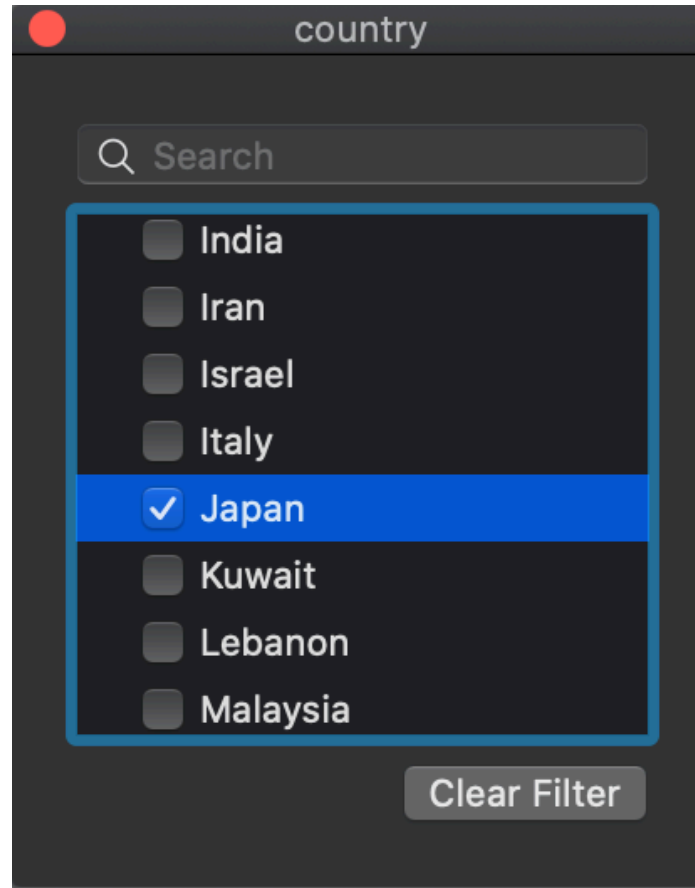
OK

	A	B
1	country	(All) ▼
2		
3	Row Labels ▼	Average of age
4	female	49.63
5	male	49.85
6	n/a	37.70
7	Grand Total	49.48

# Pivot Table: Filter

Since **Country** field is added to the Filters area, the pivot table can **filter by country**

To apply filter to show only **Japan**, click the **filter drop down** and select **Japan**



	A	B
1	country	Japan
2		
3	Row Labels	Average of age
4	n/a	5.00
5	female	54.00
6	male	56.65
7	Grand Total	55.46

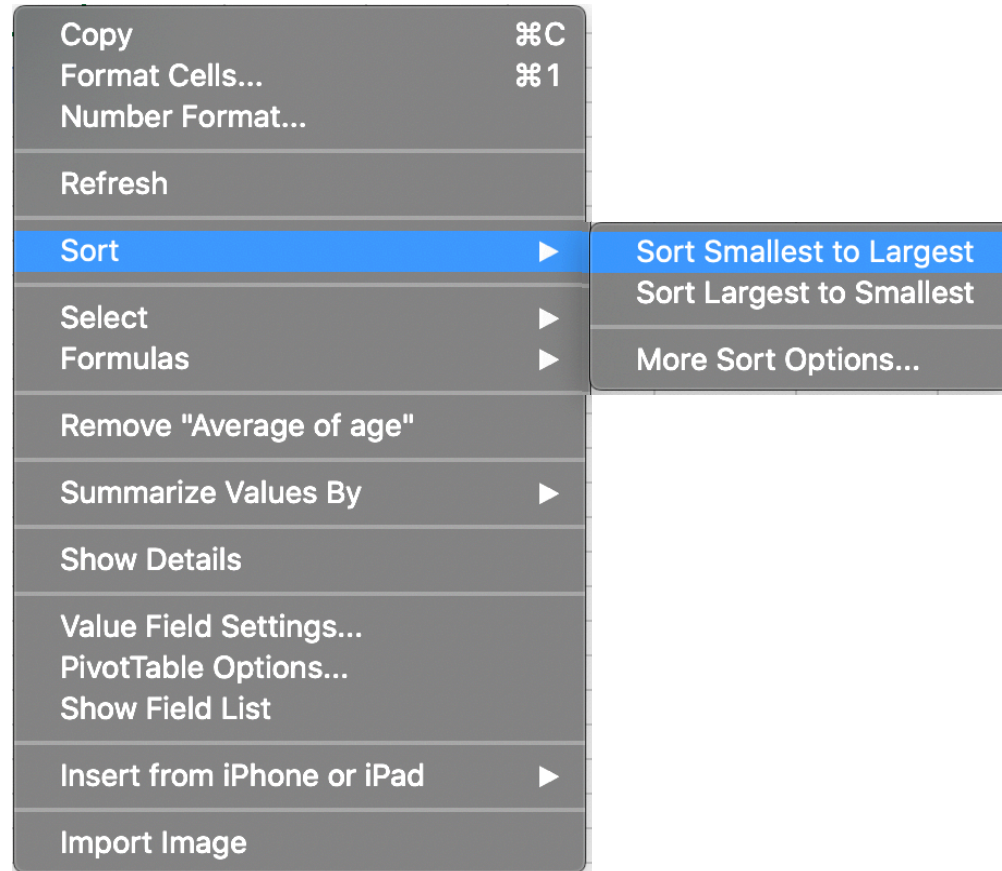


# Pivot Table: Sort

To sort Average of age in Pivot table:

Click on any cell in the Average of age Column

Right click and select **Sort**, then click on **Sort Smallest to Largest**



	A	B
1	country	(All) ▼
2		
3	Row Labels ▼↑	Average of age
4	n/a	37.70
5	female	49.63
6	male	49.85
7	Grand Total	49.48

# PivotChart

Create Pivot table with chart that filters by country and shows gender by age:

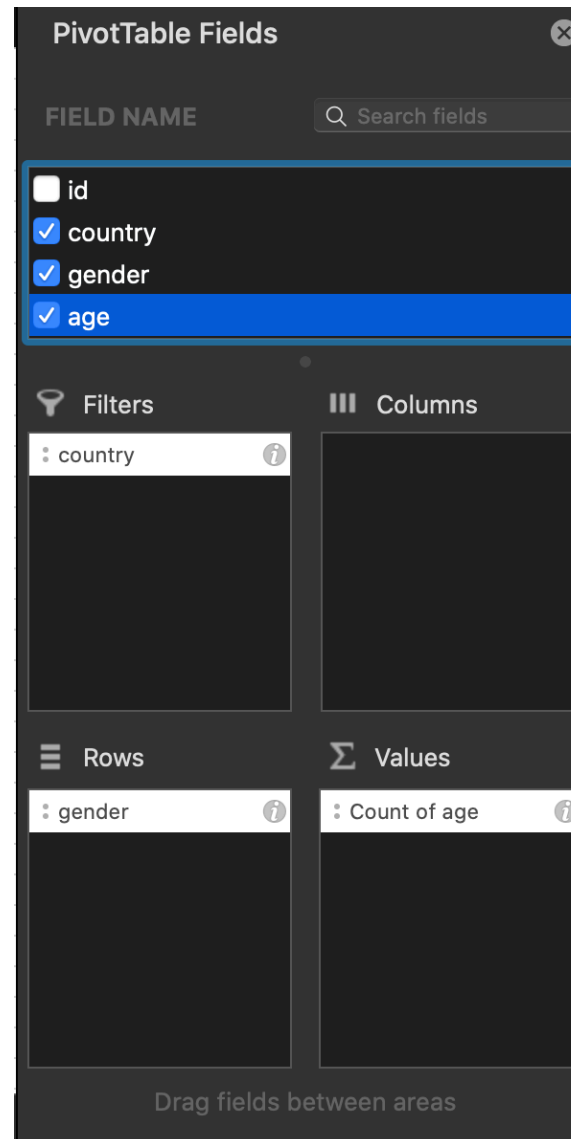
Click on any cells in the data set

Under **Insert**, select **Pivot Chart**

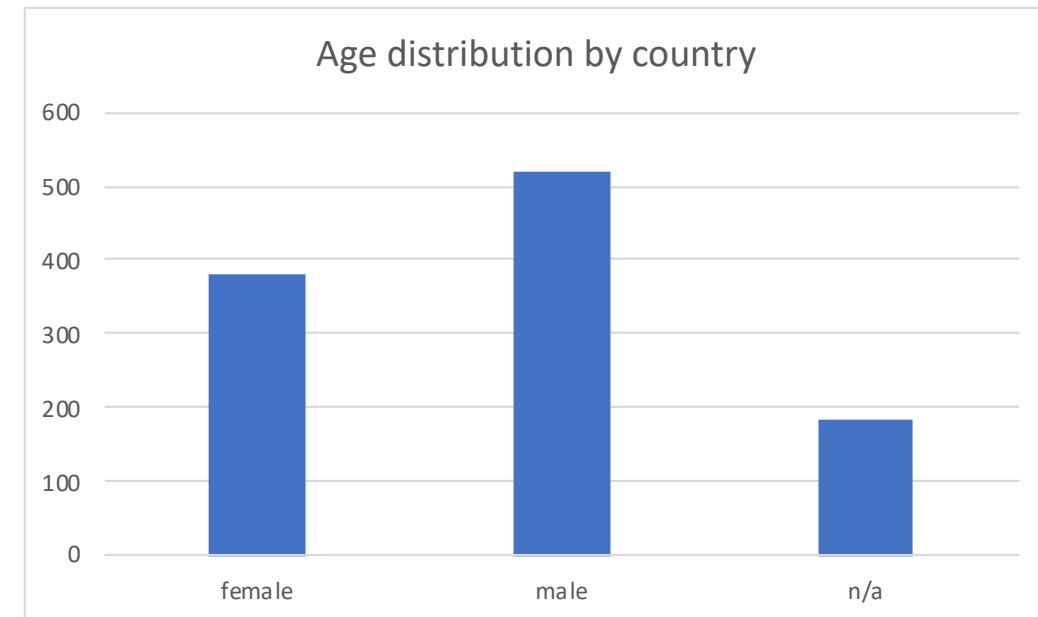
When Create PivotTable box appears, default is new worksheet, so click **OK**

**Pivot Table Fields** pane then appear, drag the following into different areas:

- **Country** to the **Filter** area
- **Gender** to the **Rows** area
- **Age** to the **Values** area



	A	B
1	country	(All) ▼
2		
3	Row Labels ▼	Count of age
4	female	382
5	male	519
6	n/a	184
7	Grand Total	1085



# Hands-on exercise

Using the **Broadway** data set:

1. Generate the output for **sorting** show type first followed by show title in alphabetical order.
2. Calculate **minimum, maximum and average values** for statistics attendance, capacity and gross, gross potential and performances using the whole data set.
3. Suppose that you are the theatre manager for Richard Rogers Theatre, where Hamilton is playing (see tab that is named “hamilton”), what are the **exact VLOOKUP** functions that can be used to find the statistics attendance, capacity, gross and number of performances by entering the Date.Full?
4. Build a **pivot table** that is filterable by year, theatre name and show name to show the number of audience attendance for each show type. With the table, answer the following questions:
  - a. What’s **average** of total audience attendance for all the show type?
  - b. What is the **total number** of audience attendance for the Imperial Theatre in the year of 2010?
5. **\*Challenge\*** Build a **2D** pivot table that is filterable by year and shows the gross dollar amount by show type for each show.

# In the end

1. There are **lots of features and functions** in Excel than what you think
2. Practice makes perfect, the **more** you use it, the **better** you will be
3. Lots of resources:
  - a. **Microsoft**: <https://support.office.com/en-us/article/excel-for-windows-training-9bc05390-e94c-46af-a5b3-d7c22f6990bb>
  - b. **Excel Exposure**: <https://excelexposure.com/lesson-guide/>
  - c. **Contextures**: <https://www.contextures.com/>
  - d. **LinkedIn Learning**: <https://www.cmc.edu/information-technology/linkedin-learning>

# Questions?

Visit QCL at the Kravis Center Lower Court or email us at [qcl@cmc.edu](mailto:qcl@cmc.edu)

# Thank You