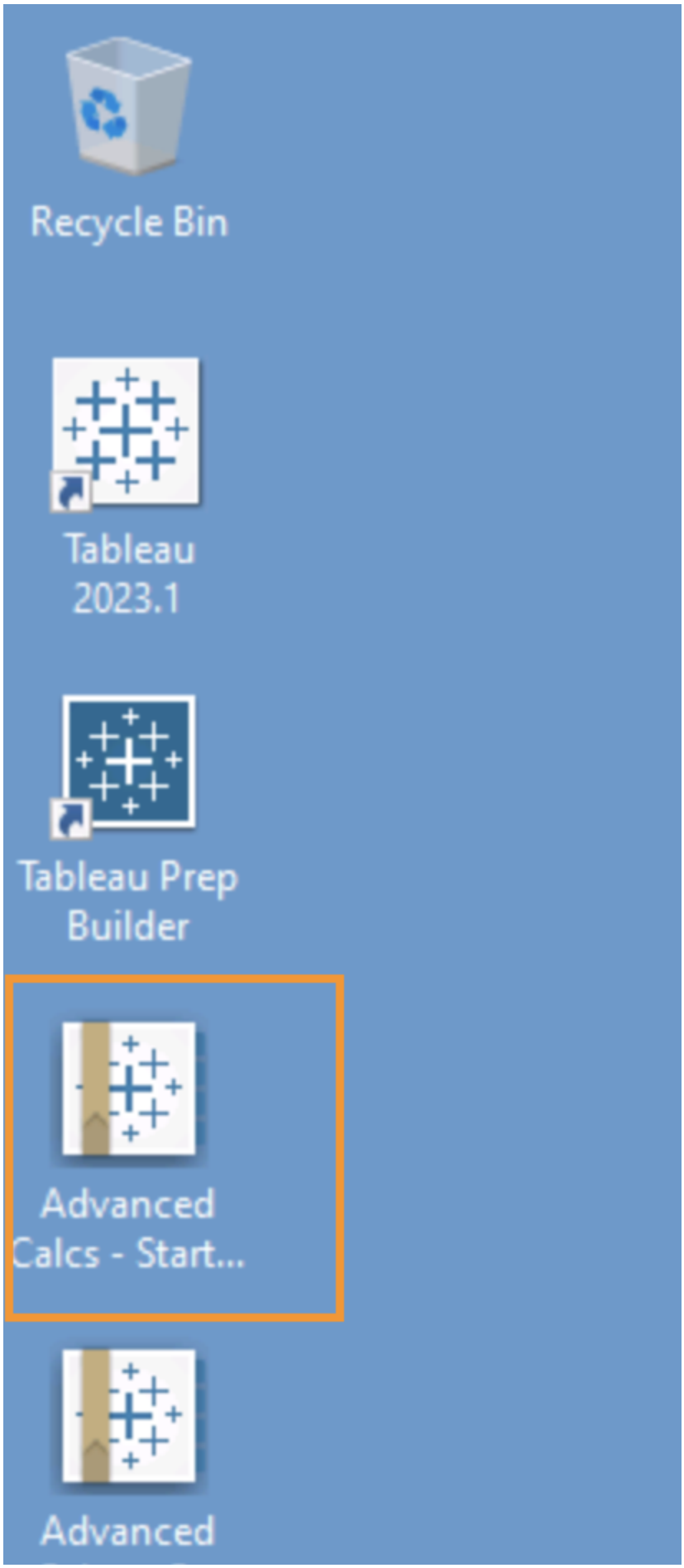
Welcome to Advanced Calcs | IF [You Attend] THEN "Calcs Expert" END

Steps to find and open the Tableau starter workbook

1. In the VM (to the left of the instructions), find **Advanced Calcs - Starter Workbook** (4th icon)


Recycle Bin
Tableau 2023.1
Tableau Prep Builder
Advanced Calcs - Start...
Advanced

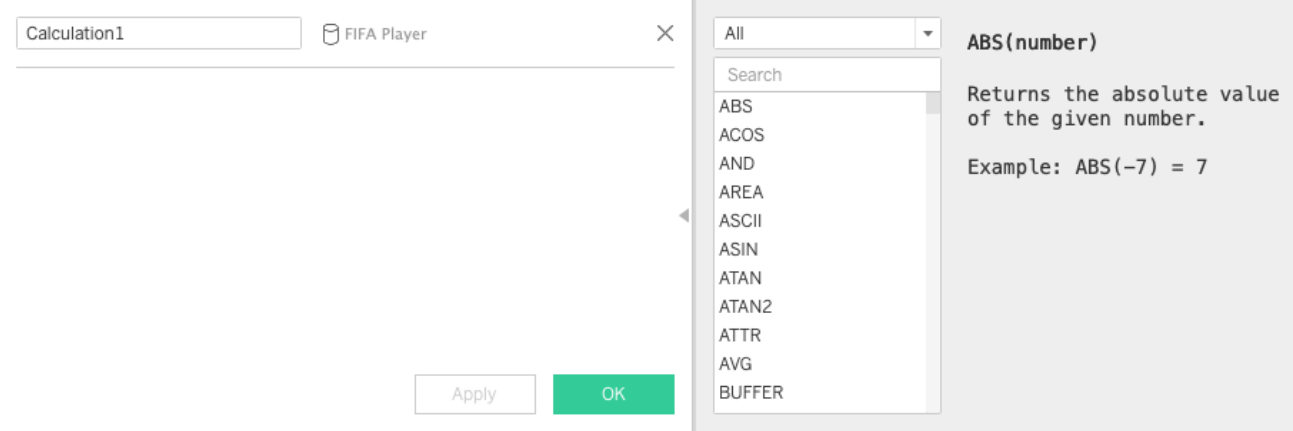
2. Double-click to open **Advanced Calcs - Starter Workbook**
3. Maximize the workbook

Steps to create a calculated field

1. Within the Data pane, select the **drop-down arrow** (to the right of the search bar)
2. Select **Create Calculated Field**
3. Enter formula

Steps to see available functions within the calculation editor

1. Within the Data pane, select the **drop-down arrow** (to the right of the search bar)
2. Select **Create Calculated Field**
3. Click the **triangle icon** on the right-hand side of the calculation editor
4. Search for function



To make the picture larger, click on the image

The next pages contain step-by-step instructions for each hands-on and challenge activity. Click **Next** to begin!

1.1: PROPER Function | Hands-On Activity

Goal: convert the players names to proper title casing

1. Use worksheet tab **1.1: PROPER Function**
2. Create a calculated field named **Player Full Name_proper**

```
PROPER([Player Full Name])
```

3. Drag and drop **Player Full Name_proper** onto Rows (farthest to the right)
4. Select **Add all members**

1.2: First Name | Hands-On Activity

Goal: find and separate the player's first name, using the field **Player Full Name_proper** from Hands-On Activity 1.1

1. Use worksheet tab **1.2: First Name**
2. Create a calculated field named **Name Contains Comma?**

> We want to understand if the players name contains a comma

```
CONTAINS([Player Full Name_proper],',')
```

3. Drag and drop **Name Contains Comma?** onto Rows (farthest to the right)

---

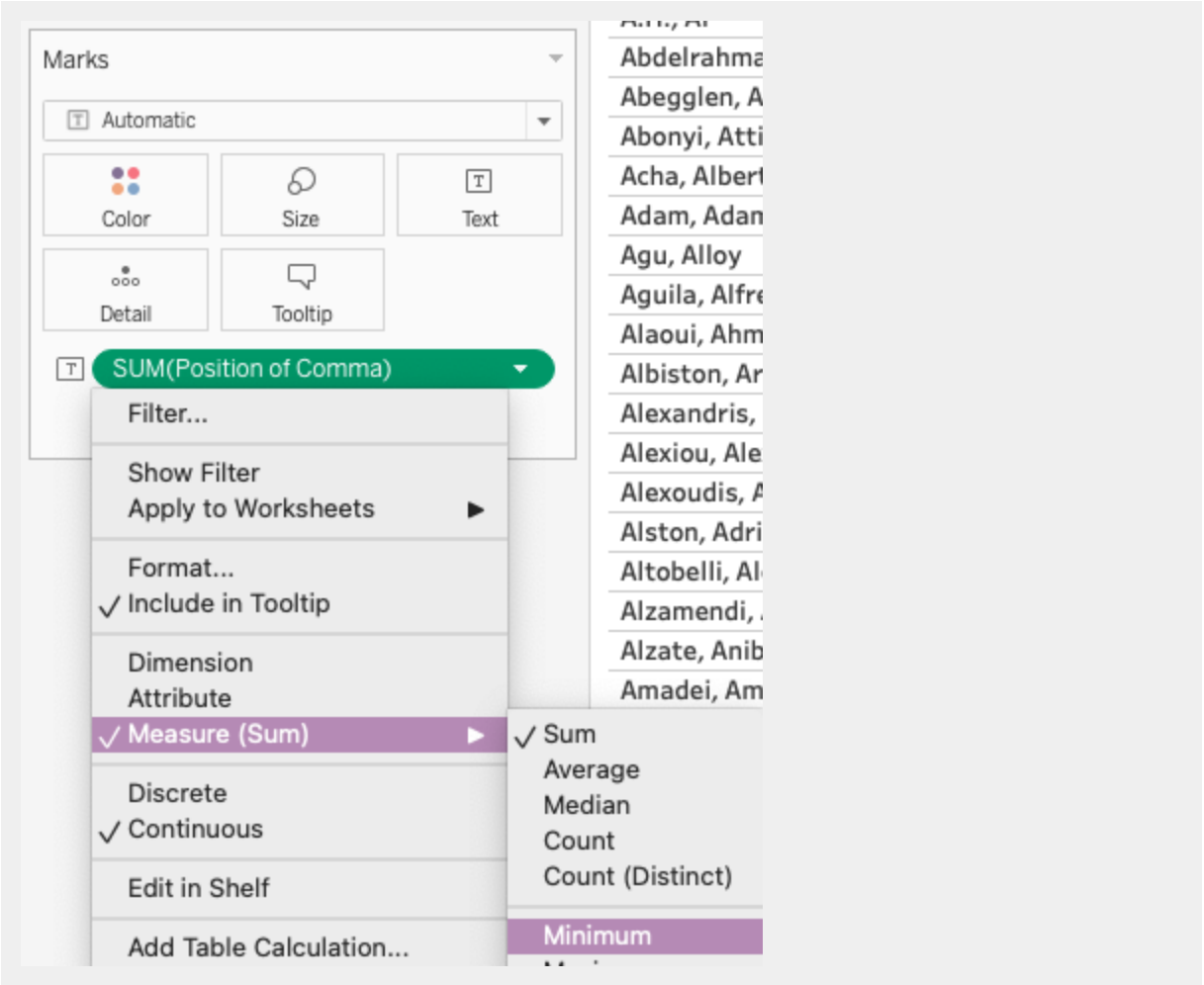
4. Create a calculated field named **Position of Comma**

> We want to understand where the comma is located

```
FIND([Player Full Name_proper],',')
```

5. Drag and drop **Position of Comma** to **Text** on the Marks Card
6. Change **Position of Comma** aggregation to **MIN**

> We want to aggregate the calculation to help us understand, in an easy way, where the comma is located within each player's name



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7. Create a calculated field named **Player First Name**

```
IF [Name Contains Comma?] = TRUE
THEN RIGHT([Player Full Name_proper],
    LEN([Player Full Name_proper])
    - [Position of Comma] - 1)
END
```

8. Drag and drop **Player First Name** onto Rows (farthest to the right)

1.3: Last Name | Challenge

Goal: find and separate the player's last name

1. Use worksheet tab **1.3: Last Name**
2. Create a calculated field named **Player Last Name**
3. Drag and drop **Player Last Name** onto Rows (farthest to the right)

▼ Calc Help? (click to expand)

```
IF [Name Contains Comma?] = TRUE
THEN LEFT([Player Full Name_proper],
    [Position of Comma] - 1)
END
```

▼ You Did It! Compare your result. (click to expand)

To make the picture larger, click on the image

1.3: Last Name

Player_Full_Name_(TC)	Contains_Comma_(TC)	Player_First_Name_(TC)	Player Last Name	
A.H., Al	True	Al	A.H.	5
Abdelrahman, Adel	True	Adel	Abdelrahman	12
Abegglen, Andre	True	Andre	Abegglen	9
Abonyi, Attila	True	Attila	Abonyi	7
Acha, Alberto	True	Alberto	Acha	5
Adam, Adam	True	Adam	Adam	5
Agu, Alloy	True	Alloy	Agu	4
Aguila, Alfredo	True	Alfredo	Aguila	7
Alaoui, Ahmed	True	Ahmed	Alaoui	7
Albiston, Arthur	True	Arthur	Albiston	9
Alexandris, Alekos	True	Alekos	Alexandris	11
Alexiou, Alexis	True	Alexis	Alexiou	8
Alexoudis, Alexis	True	Alexis	Alexoudis	10
Alston, Adrian	True	Adrian	Alston	7
Altobelli, Alessandro	True	Alessandro	Altobelli	10
Alzamendi, Antonio	True	Antonio	Alzamendi	10
Alzate, Anibal	True	Anibal	Alzate	7
Amadei, Amedeo	True	Amedeo	Amadei	7
Amanallah, Azeddine	True	Azeddine	Amanallah	10
Anbari, Abdulaziz	True	Abdulaziz	Anbari	7
Ancheta, Atilio	True	Atilio	Ancheta	8
Andersson, Ake	True	Ake	Andersson	10
Ankovic, Andrija	True	Andrija	Ankovic	8
Anzi, Awwad	True	Awwad	Anzi	5
Arias, Antonio	True	Antonio	Arias	6
Asanovic, Aljosa	True	Aljosa	Asanovic	9
Aspe, Alberto	True	Alberto	Aspe	5
Aston, Alfred	True	Alfred	Aston	6
Atanackovic, Aleksandar	True	Aleksandar	Atanackovic	12
Auguste, Arsene	True	Arsene	Auguste	8
Auld, Andrew	True	Andrew	Auld	5
B J Kim	False	Null	Null	0
B K Kim	False	Null	Null	0

1.4: First and Last Name | Challenge

Goal: format all FIFA player names as 'First Name Last Name'

1. Use worksheet tab **1.4: First and Last Name**
2. Create a calculated field named **Player Name**
3. Drag and drop **Player Name** onto Rows (farthest to the right)

▼ Calc Help? (click to expand)

```
IF  [Name Contains Comma?] = TRUE
    THEN [Player First Name] + ' '
    + [Player Last Name]
ELSE [Player Full Name_proper]
END
```

▼ You Did It! Compare your result. (click to expand)

To make the picture larger, click on the image

1.4: First and Last Name

Player_Full_Name_(TC)	Contains_Comma_(TC)	Player_First_Name_(TC)	Player_Last_Name_(TC)	Player Name	
A.H., Al	True	Al	A.H.	Al A.H.	5
Abdelrahman, Adel	True	Adel	Abdelrahman	Adel Abdelrahman	12
Abegglen, Andre	True	Andre	Abegglen	Andre Abegglen	9
Abonyi, Attila	True	Attila	Abonyi	Attila Abonyi	7
Acha, Alberto	True	Alberto	Acha	Alberto Acha	5
Adam, Adam	True	Adam	Adam	Adam Adam	5
Agu, Alloy	True	Alloy	Agu	Alloy Agu	4
Aguila, Alfredo	True	Alfredo	Aguila	Alfredo Aguila	7
Alaoui, Ahmed	True	Ahmed	Alaoui	Ahmed Alaoui	7
Albiston, Arthur	True	Arthur	Albiston	Arthur Albiston	9
Alexandris, Alekos	True	Alekos	Alexandris	Alekos Alexandris	11
Alexiou, Alexis	True	Alexis	Alexiou	Alexis Alexiou	8
Alexoudis, Alexis	True	Alexis	Alexoudis	Alexis Alexoudis	10
Alston, Adrian	True	Adrian	Alston	Adrian Alston	7
Altobelli, Alessandro	True	Alessandro	Altobelli	Alessandro Altobelli	10
Alzamendi, Antonio	True	Antonio	Alzamendi	Antonio Alzamendi	10
Alzate, Anibal	True	Anibal	Alzate	Anibal Alzate	7
Amadei, Amedeo	True	Amedeo	Amadei	Amedeo Amadei	7
Amanallah, Azeddine	True	Azeddine	Amanallah	Azeddine Amanallah	10
Anbari, Abdulaziz	True	Abdulaziz	Anbari	Abdulaziz Anbari	7
Ancheta, Atilio	True	Atilio	Ancheta	Atilio Ancheta	8
Andersson, Ake	True	Ake	Andersson	Ake Andersson	10
Ankovic, Andrija	True	Andrija	Ankovic	Andrija Ankovic	8
Anzi, Awwad	True	Awwad	Anzi	Awwad Anzi	5
Arias, Antonio	True	Antonio	Arias	Antonio Arias	6
Asanovic, Aljosa	True	Aljosa	Asanovic	Aljosa Asanovic	9
Aspe, Alberto	True	Alberto	Aspe	Alberto Aspe	5
Aston, Alfred	True	Alfred	Aston	Alfred Aston	6
Atanackovic, Aleksandar	True	Aleksandar	Atanackovic	Aleksandar Atanackovic	12
Auguste, Arsene	True	Arsene	Auguste	Arsene Auguste	8
Auld, Andrew	True	Andrew	Auld	Andrew Auld	5
B J Kim	False	Null	Null	B J Kim	0
B K Kim	False	Null	Null	B K Kim	0
B Qu	False	Null	Null	B Qu	0
B Y Lee	False	Null	Null	B Y Lee	0
B. Alves	False	Null	Null	B. Alves	0

We are now ready to review **Date Calcs**!

2.1: Quarterly Velocity | Hands-On Activity

Goal: create a dimension that can replace Month and Day in the viz in order to compare all quarters together

1. Use worksheet tab **2.1: Quarterly Velocity**
2. Create a calculated field named **Days from First Day of Quarter**

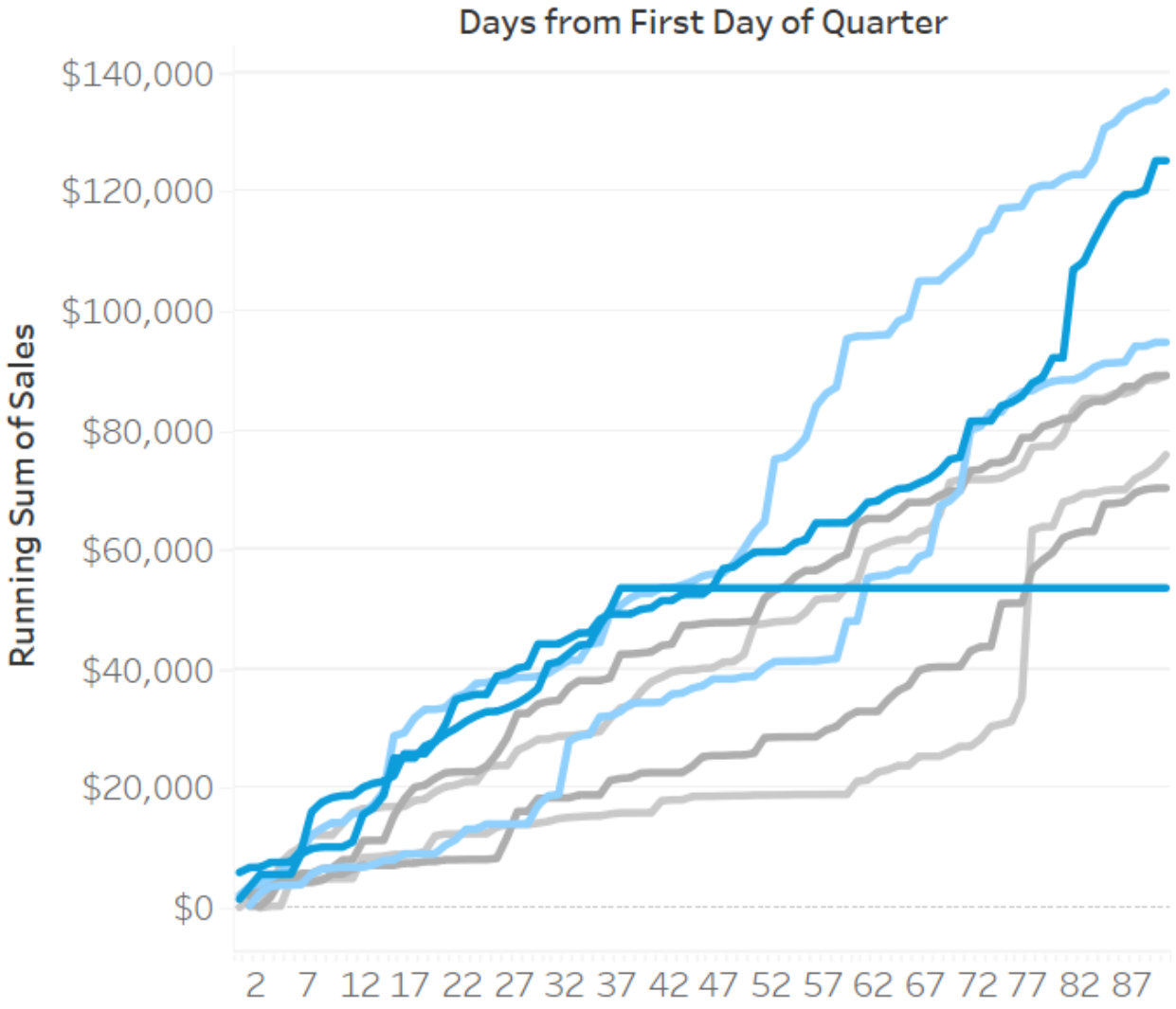
> We want to understand how many days have passed between the first day of a quarter and the Order Date

```
DATEDIFF('day',
    DATETRUNC('quarter',[Order Date])
,[Order Date])
```

3. In the Data pane, right-click **Days from First Day of Quarter** and select **Convert to dimension**
4. Remove **Month** and **Day** from the Columns shelf. Remove **Year** from the Rows shelf.
5. Add **Days from First Day of Quarter** to the Columns shelf
6. Move **Quarter** to Detail

Why does my viz have a horizontal line for the rest of this quarter? How do I remove it?

> This is one way Tableau treats discrete and continuous values differently in the context of table calculations. Because **Days from First Day of Quarter** is discrete, it has headers, and Tableau fills in the missing data for the running total. To remove the horizontal line, simply right-click the **Days from First Day of Quarter** pill on the Columns shelf and select **Continuous**. See more detail in the completed workbook.


Days from First Day of Quarter
Running Sum of Sales
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
2 7 12 17 22 27 32 37 42 47 52 57 62 67 72 77 82 87

2.2: Year Over Year and Year to Date | Hands-On Activity

Goal: compare year to date (YTD) sales against the same timeframe in prior years (Y/Y)

1. Use worksheet tab **2.2: Year Over Year and Year to Date**
2. Create a calculated field named **YTD or Future**

> We want to understand whether an Order Date is before today's date or after

```
IF MONTH([Order Date]) < MONTH(TODAY())
THEN 'YTD'
ELSEIF MONTH([Order Date]) = MONTH(TODAY())
THEN
    IF DAY([Order Date]) <= DAY(TODAY())
    THEN 'YTD'
    ELSE 'Future'
    END
ELSE 'Future'
END
```

3. Add **YTD or Future** to the filters shelf and keep only YTD

2.3: Another Year Over Year and Year to Date | Hands-On Activity

Goal: compare year to date (YTD) sales against the same timeframe in prior years (Y/Y), using a different calc!

1. Use worksheet tab **2.3: Another Year Over Year and Year to Date**
2. Create a calculated field named **YTD Order Date**

> We want to put all Order Dates in the context of this year so that we can use Tableau's native relative date filter functionality

```
DATEADD('year',
    DATEDIFF('year',[Order Date],TODAY())
,[Order Date])
```

3. Add **YTD Order Date** to the filters shelf as a year to date filter:
    - Add **YTD Order Date** to the filters shelf
    - Select **Relative Date** and click **Next**
    - Select **Years**
    - Select the **Year to date** toggle, and click **OK**

2.4: Year Over Year and Quarter to Date | Challenge

Goal: use either method from the Y/Y YTD exercise to compare quarter to date (QTD) sales against the same timeframe in prior years (Y/Y)

1. Use worksheet tab **2.4: Year Over Year and Quarter to Date**
2. Create a calculated field named **QTD or Future** *OR* create a calculated field named **QTD Order Date**
3. Apply your calculated field as a filter to the viz

▼ Calc Help? (click to expand)

QTD or Future

```
IF [Days from First Day of Quarter] <=
    DATEDIFF('day',
        DATETRUNC('quarter',TODAY())
    ,TODAY())
THEN 'QTD'
ELSE 'Future'
END
```

OR

QTD Order Date

```
DATEADD('quarter',
    DATEDIFF('quarter',[Order Date],TODAY())
,[Order Date])
```

▼ Filter Help? (click to expand)

QTD or Future

3. Add **QTD or Future** to the filters shelf and keep only **QTD**

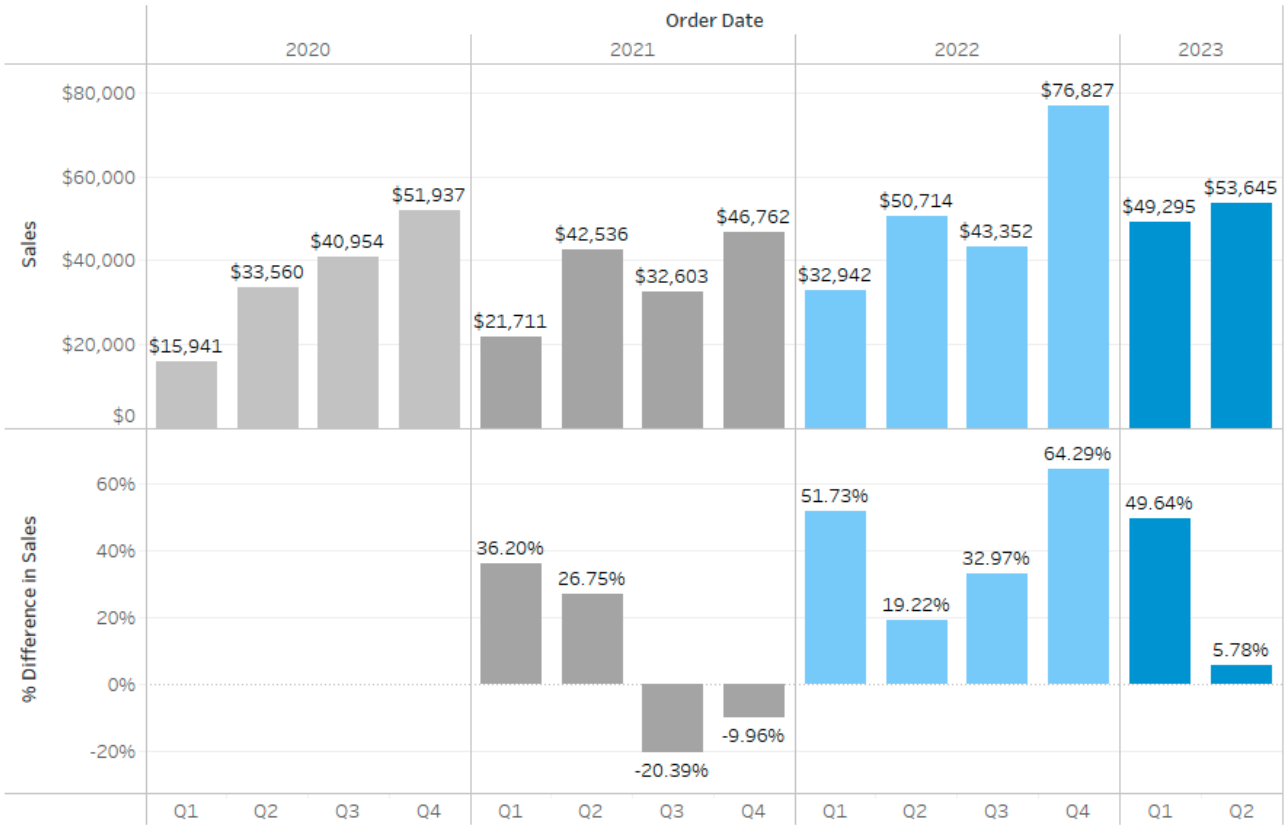
OR

QTD Order Date

3. Add **QTD Order Date** to the filters shelf as a quarter to date filter:
    - Add **QTD Order Date** to the filters shelf
    - Select **Relative Date** and click **Next**
    - Select **Quarters**
    - Select the **Quarter to date** toggle, and click **OK**

▼ You Did It! Compare your result. (click to expand)

To make the picture larger, click on the image



▼ Why do the two solutions provide slightly different numbers? (click to expand)

The two solutions determine what "quarter to date" means in two slightly different ways. The **QTD or Future** method counts the days up from the very first day of the quarter, while the **QTD Order Date** method uses Tableau's natural understanding of how calendars work. This difference shows up when we have months with 30 days vs. 31 days, for example: **QTD or Future** keeps counting the days regardless of whether it's a new month, and **QTD Order Date** takes the month into context based on our DATEADD.

QTD or Future

Order Date	Days from First Day of Quarter	QTD or Future: Future	QTD or Future: QTD
1/30/2020	29		●
1/31/2020	30		●
2/1/2020	31		●
2/2/2020	32		●
2/3/2020	33		●
2/4/2020	34		●
2/6/2020	36		●
2/7/2020	37		●
2/8/2020	38	●	
2/11/2020	41	●	
2/12/2020	42	●	

QTD Order Date

QTD Order Date	Order Date	[QTD Order Date] <= TODAY(): False	[QTD Order Date] <= TODAY(): True
4/30/2023	1/30/2020		●
	1/31/2020		●
5/1/2023	2/1/2020		●
5/2/2023	2/2/2020		●
5/3/2023	2/3/2020		●
5/4/2023	2/4/2020		●
5/6/2023	2/6/2020		●
5/7/2023	2/7/2020		●
5/8/2023	2/8/2020		●
5/11/2023	2/11/2020	●	
5/12/2023	2/12/2020	●	

Onward to **Conditional Filtering**!

3.1: Cities with 1000-2000 Medals | Hands-On Activity

Goal: determine which cities have won 1,000 or more medals but no more than 2,000 medals

1. Use worksheet tab **3.1: Cities with 1000-2000 medals**
2. Drag and drop **City** onto Filters
3. Select **Condition**
4. Select **By formula:**
5. Create formula

> Write a formula to see medals equal or greater than 1,000 but less than or equal to 2,000

```
COUNT([Medal]) >= 1000 AND
COUNT([Medal]) <= 2000
```

6. Select **OK**

3.2: Silver Medal Athletes | Hands-On Activity

Goal: determine which athletes have at least one Silver medal

1. Use worksheet tab **3.2: Silver Medal Athletes**
2. Drag and drop **Athlete** onto Filters
3. Select **Condition**
4. Select **By formula:**
5. Create formula

> Write a formula to help find athletes who have at least one Silver medal (athletes can have additional Gold and Bronze medals in addition to at least 1 Silver medal)

```
MAX(IF [Medal] = 'Silver'
THEN 1 ELSE 0 END) = 1
```

6. Select **OK**

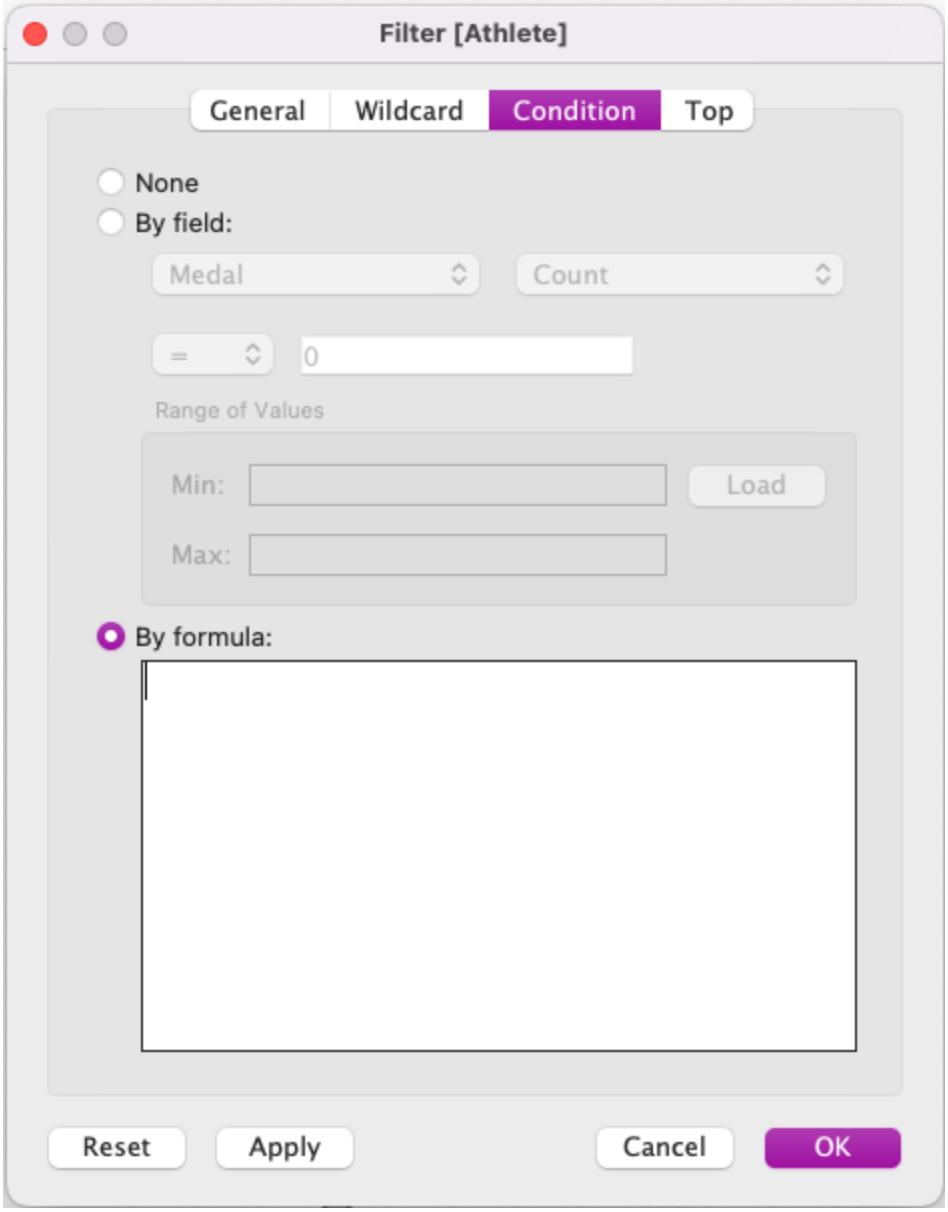
3.3: Silver and Gold Medal Athletes | Challenge

Goal: determine which athletes have only silver and gold medals

1. Use worksheet tab **3.3: Silver and Gold Medal Athletes**
2. Use conditional filtering to display **Athletes** who have Silver and Gold medals **By formula:**

▼ **Filter Help? (click to expand)**

3. Drag and drop **Athlete** onto Filters
4. Select **Condition**
5. Select **By formula:**



▼ **Formula Help? (click to expand)**

6. Create formula

We want to turn our formula into a numeric boolean:

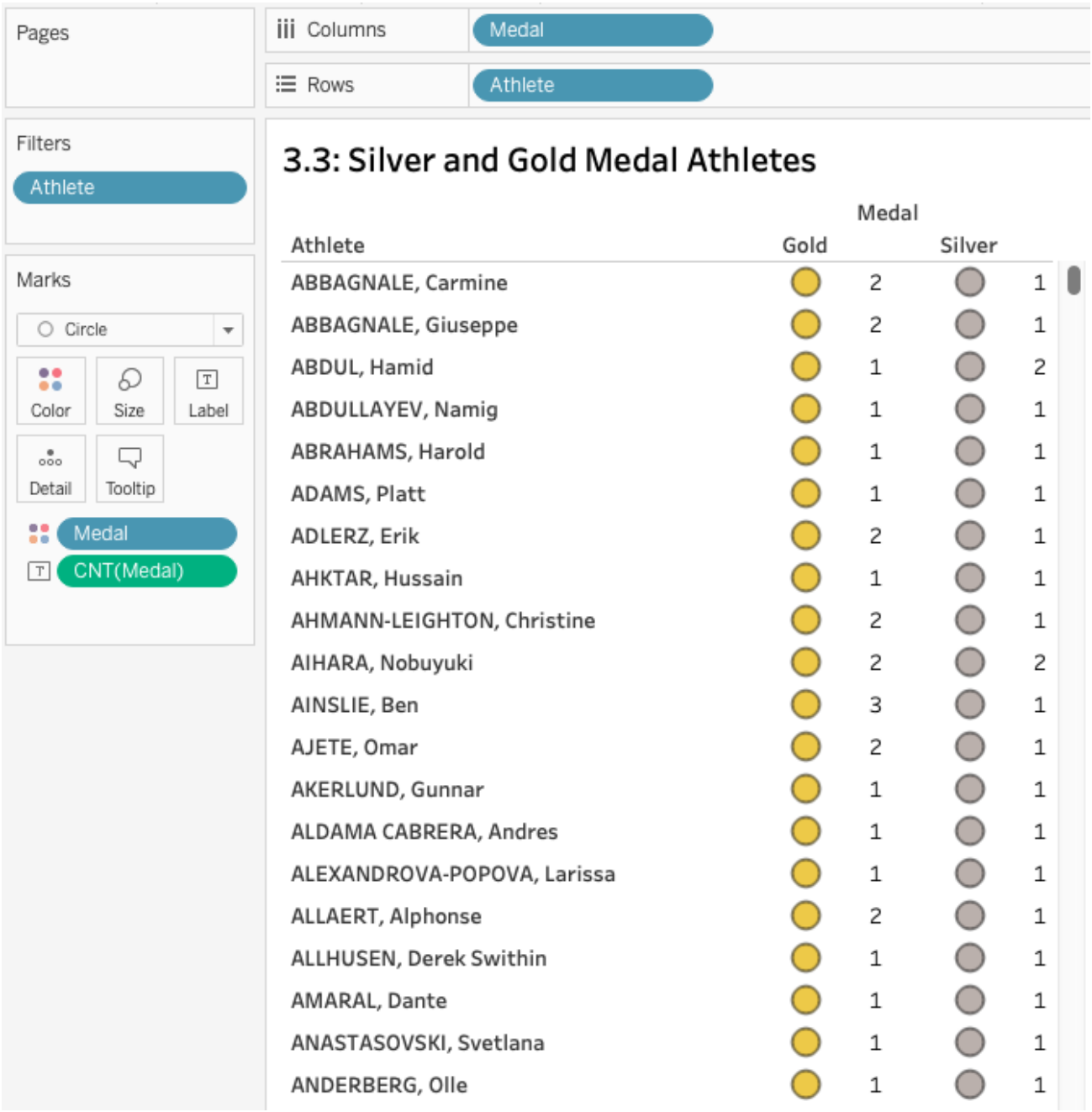
- Use an IF statement to create a numeric value to associate if an athlete has a Silver and a Gold medal
- If the athlete has a Silver and Gold medal, they will be assigned a value of 1
- If the athlete has a Bronze medal, they will be assigned a value of 5
- The calculation is adding the values assigned to EACH medal type an athlete has (example if an athlete has a Silver and Gold medal, their medal value = 2, if an athlete has a Bronze and Gold medal, their medal value = 6)
- Within the IF statement, if the medal **Maximum** value = 2, we know the athlete has a Silver and Gold medal because Tableau is adding up each medal type's value

```
MAX(IF [Medal] = 'Silver' THEN 1 ELSE 0 END)
+
MAX(IF [Medal] = 'Gold' THEN 1 ELSE 0 END)
+
MAX(IF [Medal] = 'Bronze' THEN 5 ELSE 0 END)
= 2
```

7. Select **OK**

▼ You Did It! Compare your result. (click to expand)

To make the picture larger, click on the image



We are now ready to review **Conditional Sorting**!

4.1: Sort by Gold Medals | Hands-On Activity

Goal: sort countries by the number of gold medals they won

1. Use worksheet tab **4.1: Sort by Gold Medals**
2. Create a calculated field named **Gold Medal Count**

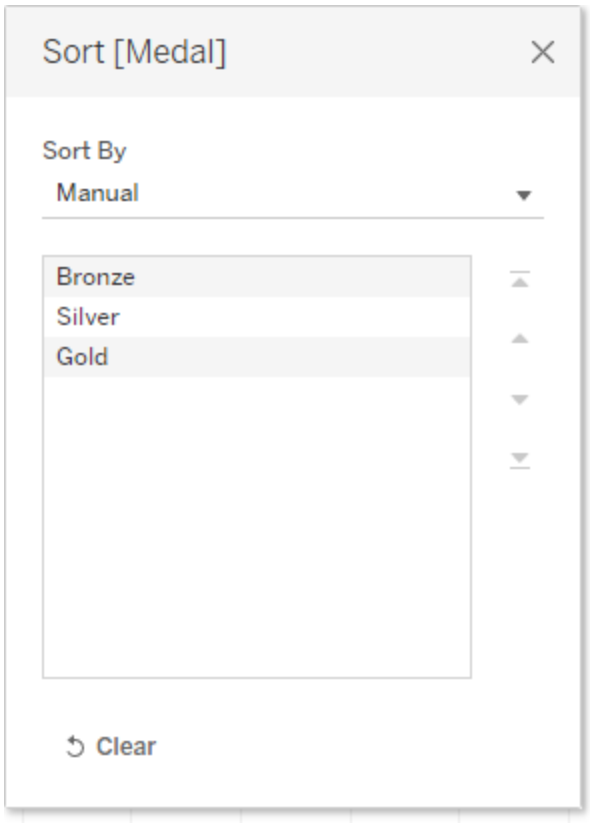
> We want to count medals only if they are gold

```
COUNT(IF [Medal] = 'Gold'
    THEN [Medal] END)
```

3. In the Rows shelf, right-click on **NOC (Country)** and select **Sort**
4. Set up the sort in the Sort window:
    - Sort By **Field**
    - Sort Order **Descending**
    - Field Name **Gold Medal Count**
    - Select the **X** in the top-right corner of the **Sort** pop-up window
5. Sort the colors to match:

> Sorting the colors so that gold medals are closest to the baseline allows us (and our viewers!) to see the sort more clearly

    - Right-click the **Medal** pill or color legend and select **Sort**
    - Drag the values around so that Gold is on the bottom and Silver is still in the middle
    - Select the **X** in the top-right corner of the **Sort** pop-up window


Sort [Medal]
Sort By
Manual
Bronze
Silver
Gold
Clear

4.2: Sort by Selected Medal | Challenge

Goal: use a parameter to switch which medal the countries are sorting by

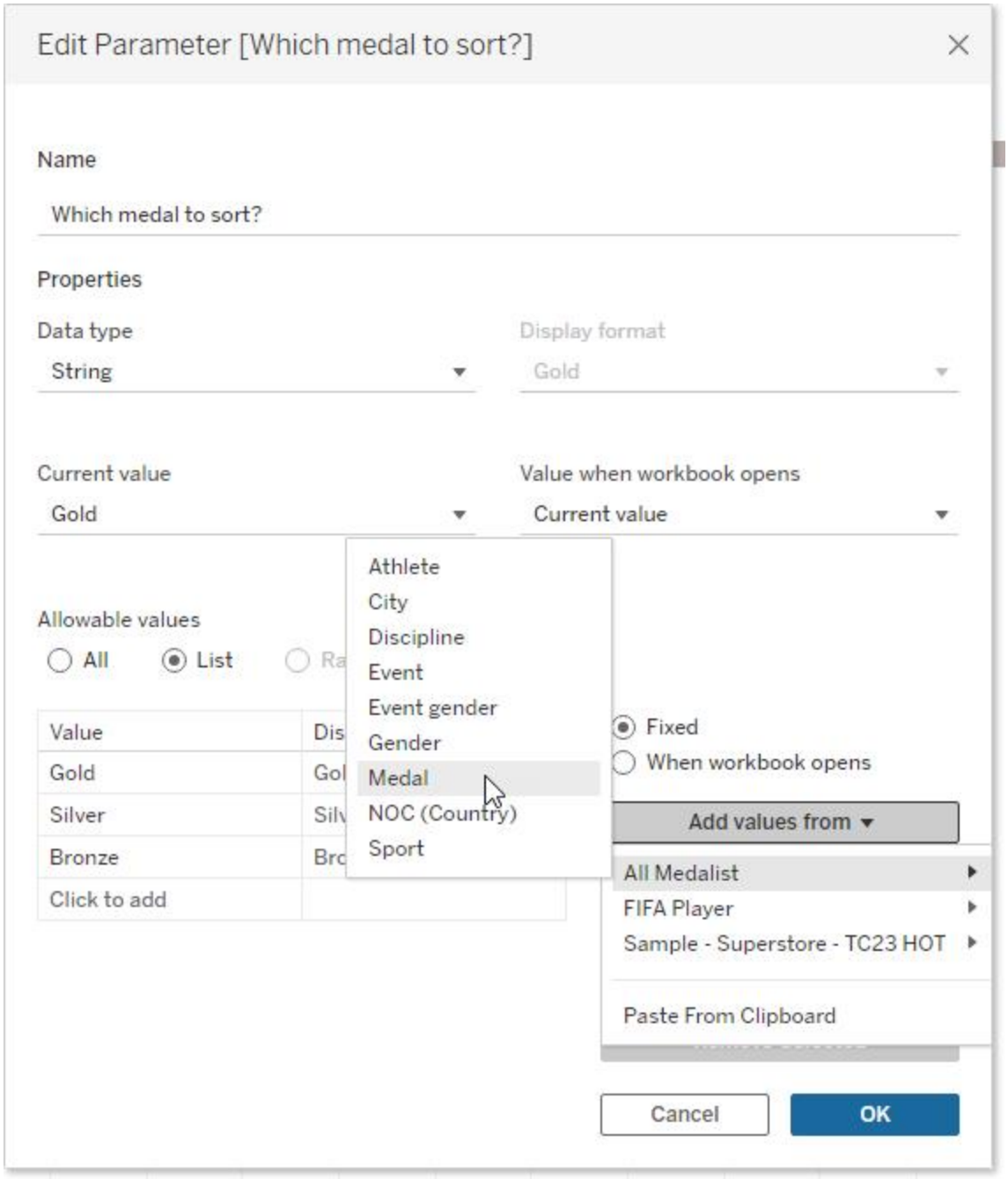
1. Use worksheet tab **4.2: Sort by Selected Medal**
2. Create a parameter called **Which medal to sort?** and show the parameter in the viz
3. Create a calculated field named **Selected Medal Count**
4. In the Rows shelf, sort on **NOC (Country)**
5. **Bonus Challenge!** Create a calculated field called **Is Selected Medal?** and use it to sort the colors

▼ Parameter Help? (click to expand)

Within the Data pane, select the **drop-down arrow** (to the right of the search field) and select **Create Parameter**

- Name **Which medal to sort?**
- Data type **String**
- Allowable values **List**
- Select **Add values from**
- **All Medalist**
- **Medal**
- Select **OK**

> To make the picture larger, click on the image



- To show the parameter, right-click **Which medal to sort?** in the Data pane and select **Show Parameter**

▼ Calc Help? (click to expand)

```
COUNT(IF [Medal] = [Which medal to sort?]
    THEN [Medal] END)
```

▼ Sort Help? (click to expand)

In the Rows shelf, right-click on **NOC (Country)** and select **Sort**:

- Sort By **Field**

- Sort Order **Descending**
- Field Name **Selected Medal Count**
- Select the **X** in the top-right corner of the **Sort** pop-up window

▼ Bonus Challenge Help? (click to expand)

- Create a calculated field named **Is Selected Medal?**

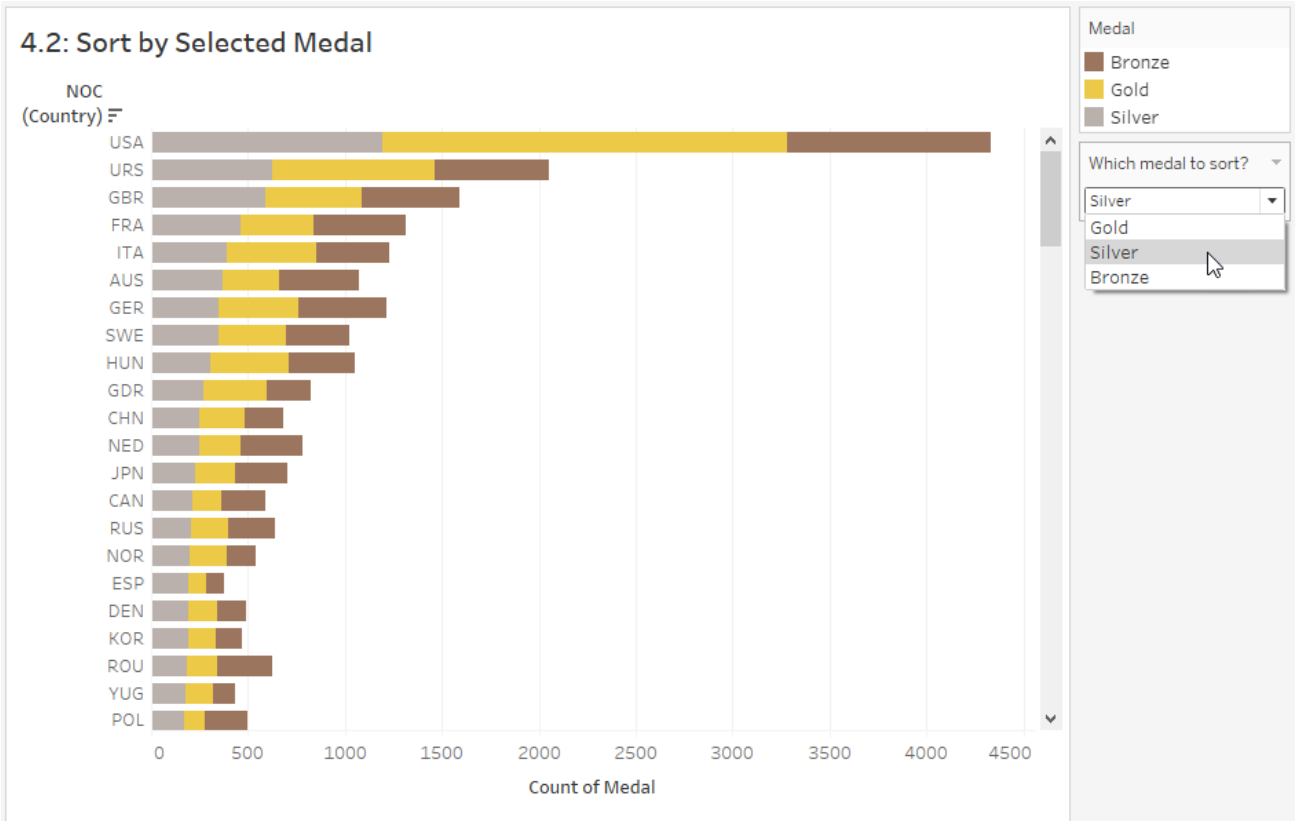
```
[Medal] = [Which medal to sort?]
```

- Right-click the **Medal** pill or color legend and select **Sort**
- Set up the sort in the Sort window:
  - Sort By **Field**
  - Sort Order **Ascending**
  - Field Name **Is Selected Medal?**
  - Aggregation **Maximum**
  - Select the **X** in the top-right corner of the **Sort** pop-up window

Using maximum here is equivalent to using minimum. Because our calc only returns data when **Medal** matches the parameter, and returns nulls everywhere else, both maximum and minimum only return one value

▼ You Did It! Compare your result. (click to expand)

To make the picture larger, click on the image


4.2: Sort by Selected Medal
NOC (Country)
USA
URS
GBR
FRA
ITA
AUS
GER
SWE
HUN
GDR
CHN
NED
JPN
CAN
RUS
NOR
ESP
DEN
KOR
ROU
YUG
POL
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Count of Medal
Medal
Bronze
Gold
Silver
Which medal to sort?
Silver
Gold
Silver
Bronze

You did all of it!

Congratulations, you made it to the end of the lab!

Download the materials from this hands-on training here: https://tableau.egnyte.com/fl/6MOHW90i8z

To close out of the lab, click **End**.