



DATA KIDS

**What are your
favorite songs?**



Data Kids: What are your favorite songs?

Presented by Tableau

Introduction

Think about the music you like to listen to. Do you have a favorite song, artist, album, or playlist? Let's start thinking about the different aspects of a song, like instruments and lyrics. Do your favorite songs have anything in common?



Maybe your favorite music falls within the same **genre**. A **genre** is a fancy term people use to describe different styles of music. Common genres include hip-hop, pop, alternative, and rock.

Maybe you prefer upbeat songs that you can dance to. The rate, or speed, of a song is called a **tempo**. If you walk, you are moving at a slow tempo. If you run, you are moving at a faster tempo. Think about how *different* your favorite song would sound if it was played a lot faster or a lot slower.

Classifying songs by genre, tempo, or using other common traits allows us to see trends in our favorite music. All of this information is valuable data that we can count, summarize, and graph!

Responsibilities

- Introduction: **10-15 minutes**
Plan to spend approximately 10-15 minutes learning about data.
- Activity: **15-20 minutes**
Plan to spend approximately 15-20 minutes collecting data about your favorite songs.
- Conclusion: **10+ minutes**
Plan to spend at least 15 minutes reading the conclusion and, if you'd like to, completing the extra credit.

Learning Objectives

- Explore and see patterns in an everyday activity
- Learn how to collect and organize data
- Make a summary table and graph of your results

Supplies

- This activity guide (printed or digital)
- A pencil
- Markers or colored pencils
- Paper
- Calculator
- Ruler
- Data table template
- For the extra credit—Tableau Desktop and the Music Data Excel template!

Review

What is data?

Data is a collection of information gathered by observation, questioning or measurement. It includes facts and statistics collected for reference or analysis and makes the basis of reasoning or calculation.

What data is qualitative?

Qualitative data is used to describe something. It's usually **subjective**, meaning it is influenced by personal feelings, tastes, or opinions. We capture qualitative data by uses our senses and asking open-ended questions.

Example: How playful is your cat?

What data is quantitative?

Quantitative data is based on numbers. It's **objective**, meaning it's based on fact and is *not* influenced by personal feelings or opinions. We capture quantitative data by counting, measuring, or asking closed-ended questions.

Example: How many pets do you have?

What quantitative data is discrete?

Discrete data is collected by **counting**. The result is a whole number.

Example: How many students are in your class? How many home runs did he hit?

What quantitative Data is continuous?

Continuous data is collected by **measuring**. The result is typically a decimal or fraction.

Example: How tall are you in inches? What is the temperature in °F?

What is a data visualization?

A data visualization is a visual representation of information and data. It provides an easy way to see and understand trends, outliers, and patterns.

What is Tableau?

A tool that helps you see and understand your data quickly and easily.

Activity Instructions

Step 1: Use the "Music Data" template in Excel, the ready-made blank table, or draw a grid with 6 columns. It should like the example below. Title the first column **Song Names**, then write down the names of 5-10 of your favorite songs.

Song Name					
Blinding Lights					
Savage Love					
Watermelon Sugar					
Happy					
Panini					
Cake by the Ocean					
7 Rings					
24K Magic					
Put Your Records On					
Since U Been Gone					

Step 2: Think about traits you could explore about these songs. For this activity, we're going to collect data about the **Album**, **Artist**, **Genre**, **Year**, and **Song Length**. Add those headings to your table, like the example below.

Song Name	Album	Artist	Genre	Year	Song Length
Blinding Lights					
Savage Love					
Watermelon Sugar					
Happy					
Panini					
Cake by the Ocean					
7 Rings					
24K Magic					
Put Your Records On					
Since U Been Gone					

Step 3: Fill out the table by looking up each song on Google, Spotify, or Apple Music.

Song Name	Album	Artist	Genre	Year	Song Length
Blinding Lights	Blinding Lights	The Weekend	R&B	2019	3:20
Savage Love	Savage Love	Jason Derulo	Hip-Hop	2020	2:49
Watermelon Sugar	Fine Line	Harry Styles	Pop	2019	2:54
Happy	Happy	Pharrell Williams	Pop	2013	3:53
Panini	EP 7	Lil Nas X	Hip-Hop	2019	1:55
Cake by the Ocean	DNCE	DNCE	Pop	2016	3:39
7 Rings	thank u, next	Ariana Grande	Pop	2019	2:59
24K Magic	24K Magic	Bruno Mars	Funk	2016	3:46
Put Your Records On	Corinne Bailey Rae	Corinne Bailey Rae	R&B	2006	3:35
Since U Been Gone	Breakaway	Kelly Clarkson	Pop	2004	3:09

Activity Exercise

Select a difficulty level and answer the two questions within that section.

Beginner

- 1) Is **Year** *qualitative* or *quantitative*?

- 2) Is **Song Length** *discrete* or *continuous*?

Intermediate

Be sure you use the dataset you just created to answer these questions!

- 3) Which song is the **longest**? (i.e. has the greatest song length?)

- 4) Which song is the **oldest**? (i.e. has the earliest song year?)

Advanced

Pick a genre with at least 2 songs.

- 5) What is the **total song length** for all songs in that genre? Answer in **seconds**.

Hint: Grab your calculator! You'll be adding the song lengths together. If you recorded your song length in minutes + seconds like we did (e.g. 3:22), you will want to convert those minutes to seconds first. To do this, multiply the number of minutes by 60, then add the remaining seconds. (e.g. 3:22 = 202 seconds)

- 6) What is the **average song length** for all songs in that genre? Answer in **seconds**.

Hint: Grab your calculator! You'll need to divide the total song length you just calculated by the total number of songs in that genre.

Time to Visualize!

Count the number of songs that fall into each genre.

How many songs fall within each **genre**?

Using the genre totals you just calculated, make a bar chart to visualize the number of songs within each genre. Color each bar a different color.



Conclusion

Although all of the activity exercises can be completed by hand, Tableau makes it faster and easier to answer these types of questions! Let me show you how.

If you'd like to learn how to answer these questions in Tableau yourself, please see the step-by-step instructions in the Extra Credit section starting on Page 8.

Activity Answers

1) Is **Genre** *qualitative* or *quantitative* data?

Qualitative! Genre is not something you measure – it's a categorization.

2) Is **Song Length** *discrete* or *continuous*?

Continuous! Song length is an amount of time you can measure in minutes or seconds.

Note: We'll be using the first 10 songs in the sample provided to answer the questions below.

3) Which song is the **longest**? (i.e. has the greatest song length?)

Happy by Pharrell; 3 minutes, 53 seconds (233 seconds)

4) Which song is the **oldest**? (i.e. has the earliest song year?)

Put Your Records On by Corinne Bailey Rae; 2006

We're selecting R&B.

5) What is the **total song length** for all songs in that genre? Answer in seconds.

Hint: Grab your calculator! You'll be adding the song lengths together. If you recorded your song length in minutes + seconds (e.g. 3:22), you will want to convert those minutes to seconds first by multiplying the first number by 60! (e.g. 3:22 = 202 seconds)

$215 + 183 = 398$ seconds

6) What is the **average song length** for all songs in that genre?

Hint: Grab your calculator! You'll need to divide the total song length you just calculated by the total number of songs in that genre. If you recorded your song length in minutes + seconds (e.g. 3:22), you will want to convert those minutes to seconds first by multiplying the first number by 60! (e.g. 3:22 = 202 seconds)

$398 \div 2 = 199$ seconds

Activity Answers

Note: We'll be using the first 10 songs in the sample provided for this activity.

7) How many songs fall within each genre?

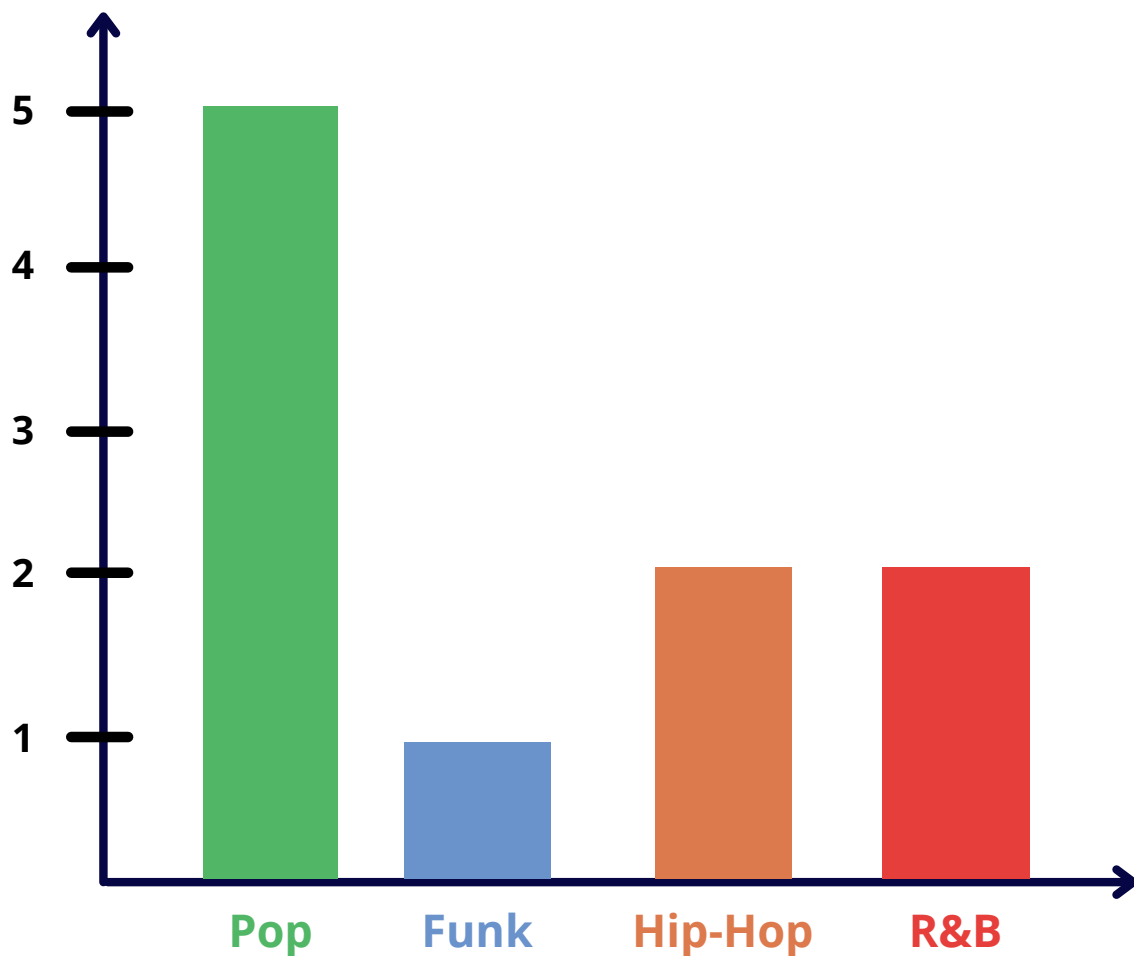
Pop = 5 songs

Funk = 1 song

Hip-Hop = 2 songs

R&B = 3 songs

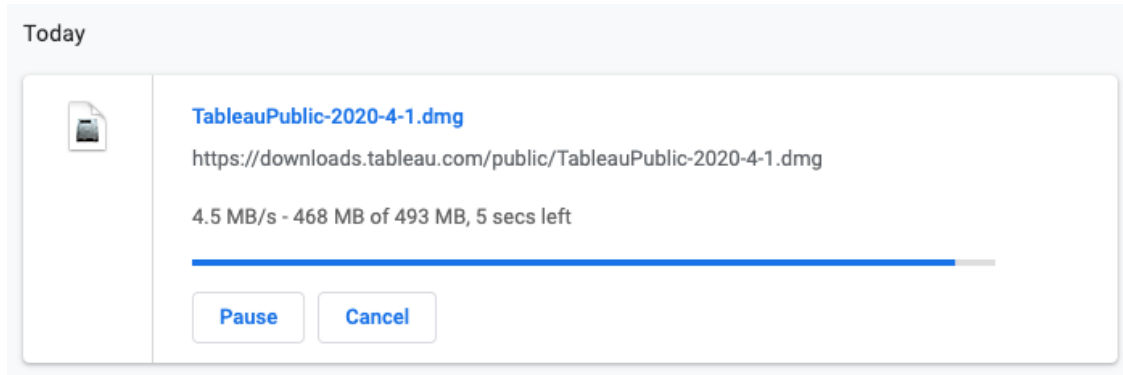
Using the totals you just calculated, make a bar chart to visualize the number of songs within each genre. Color each bar a different color.



Extra Credit

1) With the help of an adult, download Tableau Public using the link below.

<https://public.tableau.com/en-us/s/download>



2) Install the package via the install wizard.

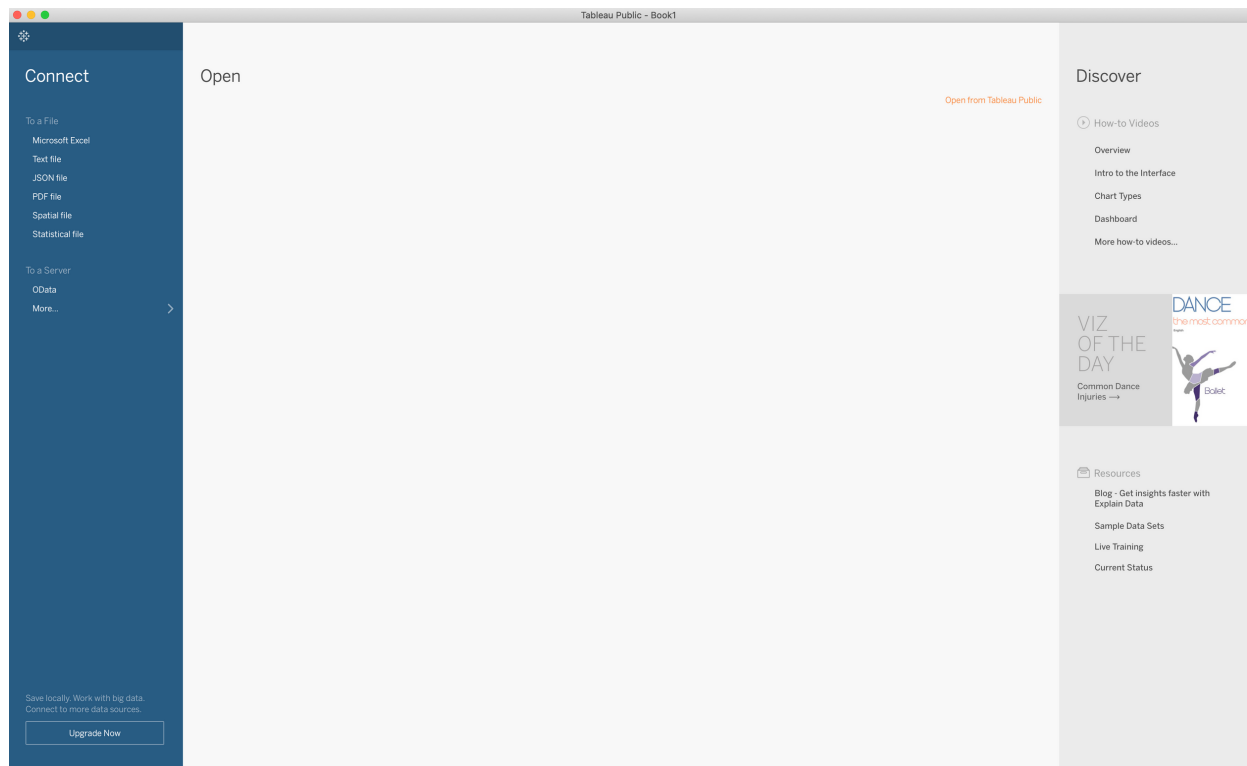


Tableau Public.pkg

3) Once installed, double click on the program to open the Tableau Public desktop application.

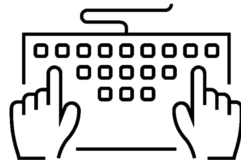


4) Once open, this is what you should see:



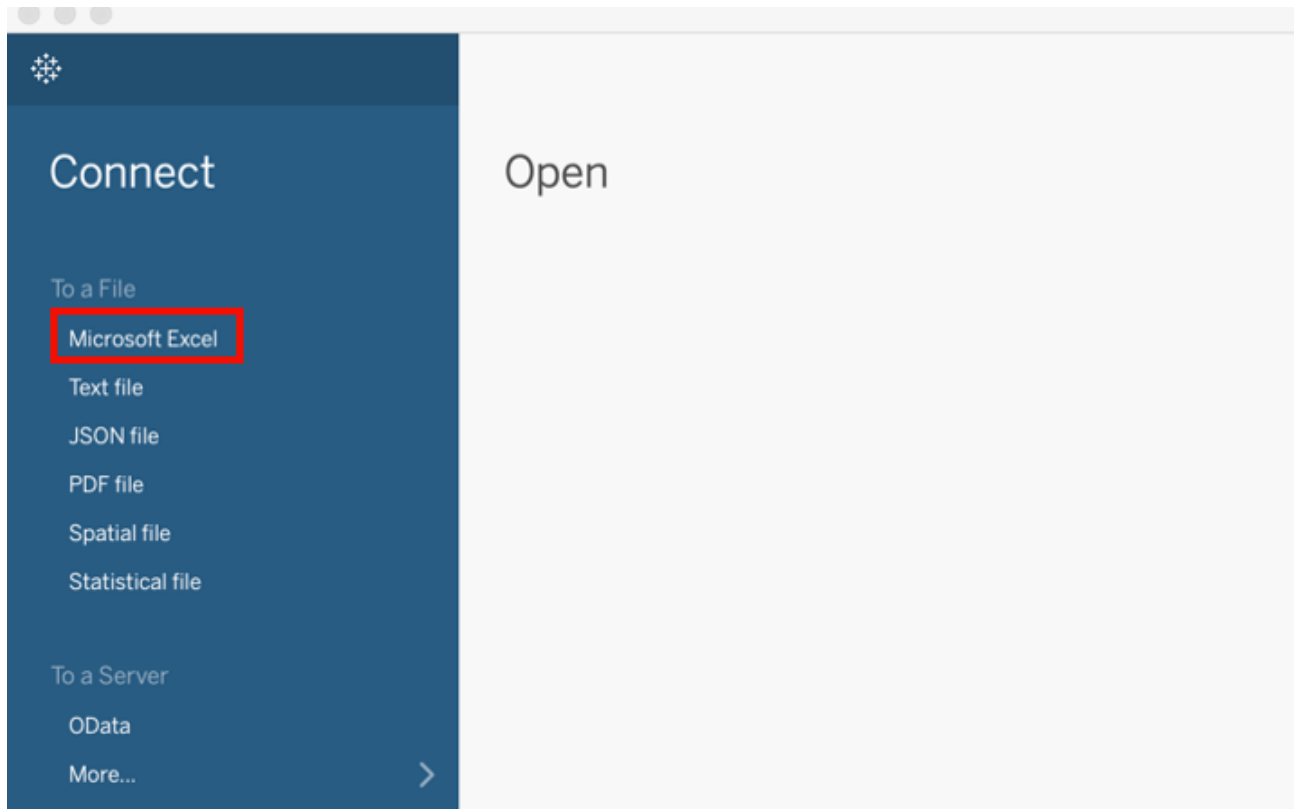
5) Now we are ready to pull in our data! If you haven't all ready, make sure to enter all of your song data into the "Song Data" Excel template provided.

	A	B	C	D	E	F
1	Song Name	Album	Artist	Genre	Year	Song Length
2						
3						
4						
5						
6						
7						

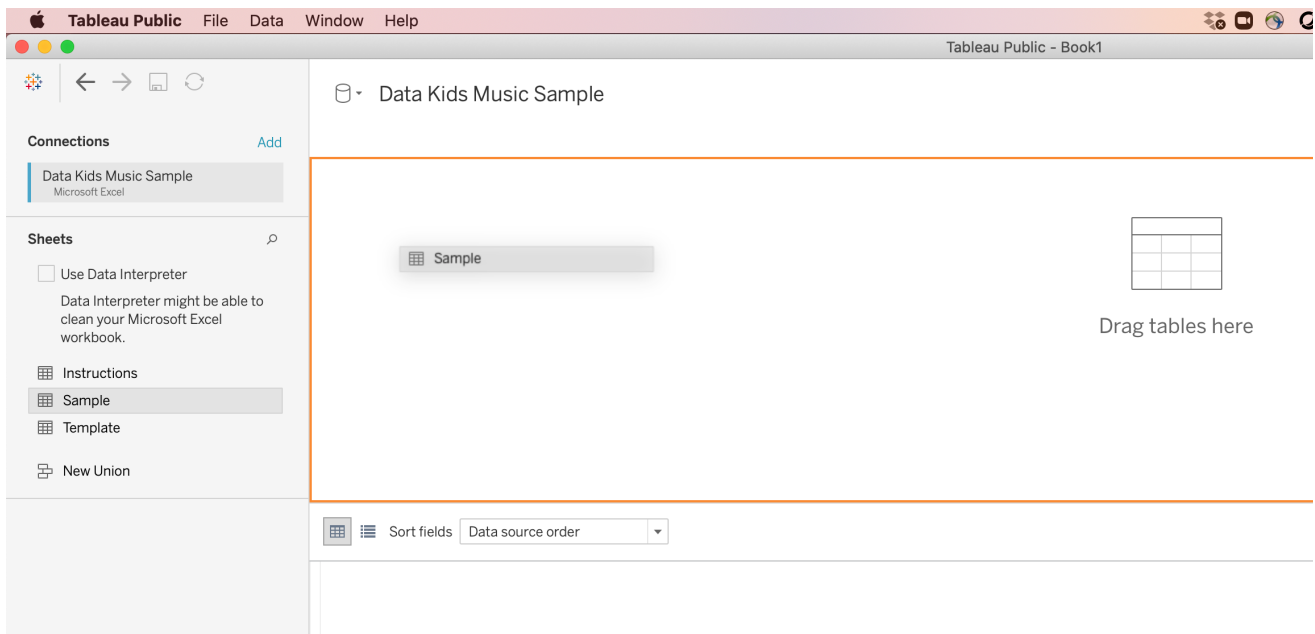


	A	B	C	D	E	F
1	Song Name	Album	Artist	Genre	Year	Song Length
2	Blinding Lights	Blinding Lights	The Weekend	R&B	2019	3:20
3	Savage Love	Savage Love	Jason Derulo	Hip-Hop	2020	2:49
4	Watermelon Sugar	Fine Line	Harry Styles	Pop	2019	2:54
5	Happy	Happy	Pharrell Williams	Pop	2013	3:53
6	Panini	EP 7	Lil Nas X	Hip-Hop	2019	1:55
7	Cake by the Ocean	DNCE	DNCE	Pop	2016	3:39
8	7 Rings	thank u, next	Ariana Grande	Pop	2019	2:59
9	24K Magic	24K Magic	Bruno Mars	Funk	2016	3:46

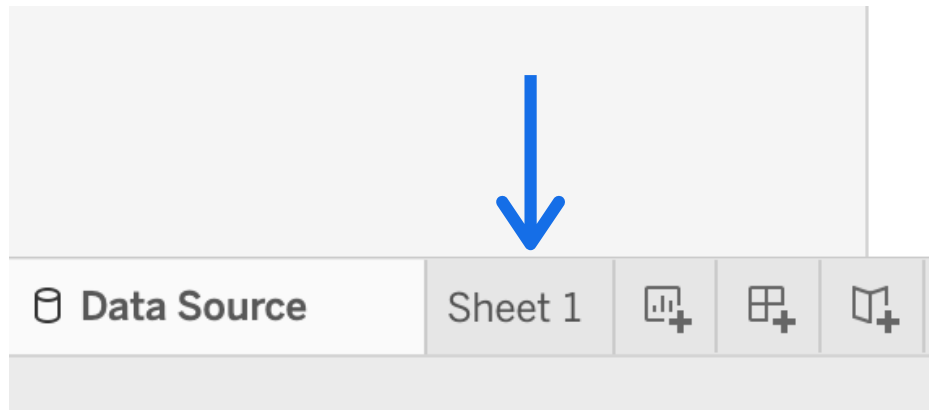
6) Now let's pull in our data! Click **Microsoft Excel** in the top left corner, then select your dataset or use the sample dataset provided.



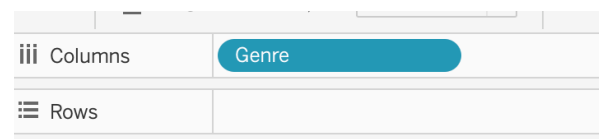
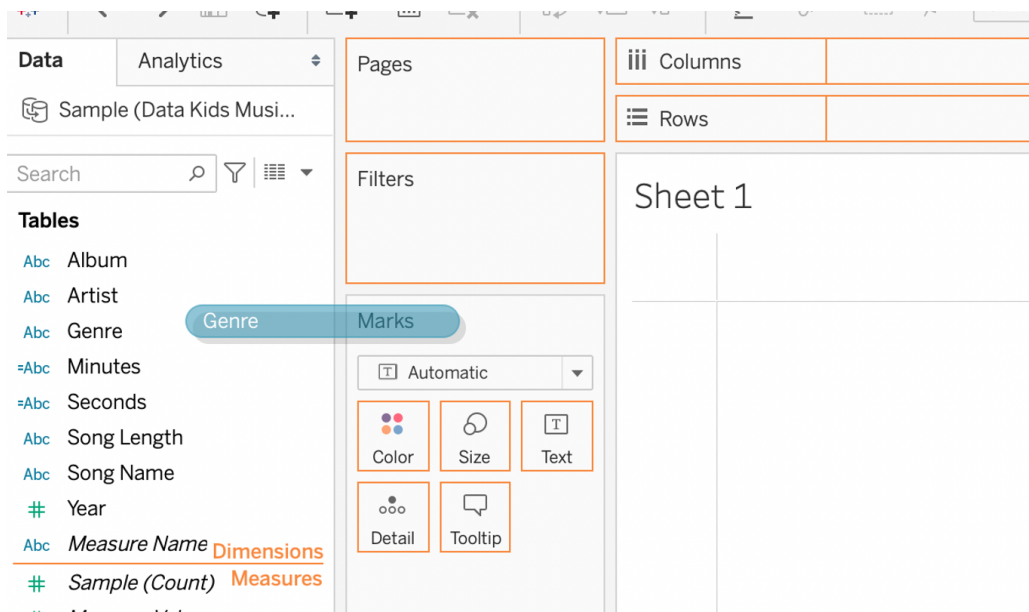
7) Now drag the sheet with your data into to white **Drag tables here** section of the screen.



8) First, let's recreate the bar chart we made to visualize number of songs per genre! Click **Sheet 1** in the bottom left corner of the screen.



Hover over the word "Genre". You'll notice a **blue oval** appear behind it. Click and drag "Genre" up and to the right, releasing it next to the word **Columns** when a little orange arrow appears.



Sheet 1

Genre					
Classic Rock	Classic Soul	Funk	Hip-Hop	Pop	Pop Roc
Abc	Abc	Abc	Abc	Abc	Ab

Now drag "Sample (Count)" to **Rows**, following the same steps above. "Sample (Count)" represents the total number of songs listed in your table.

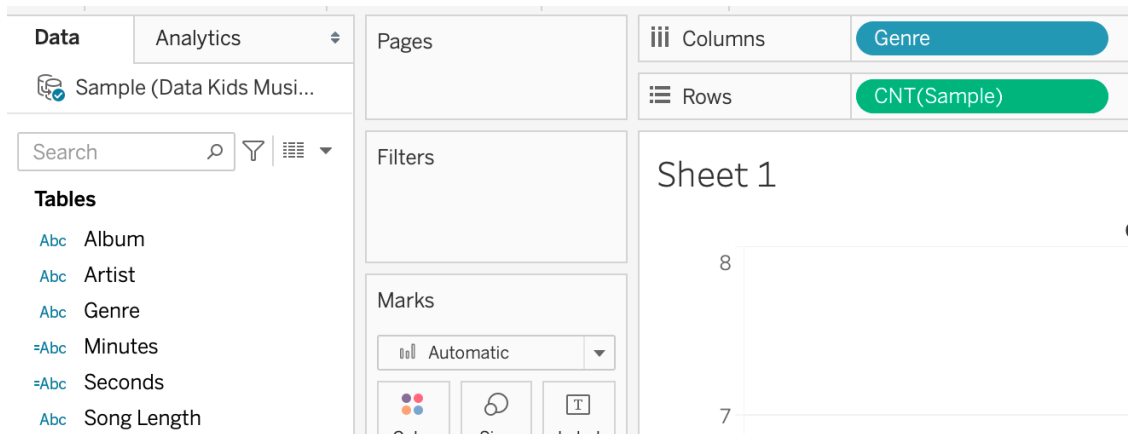
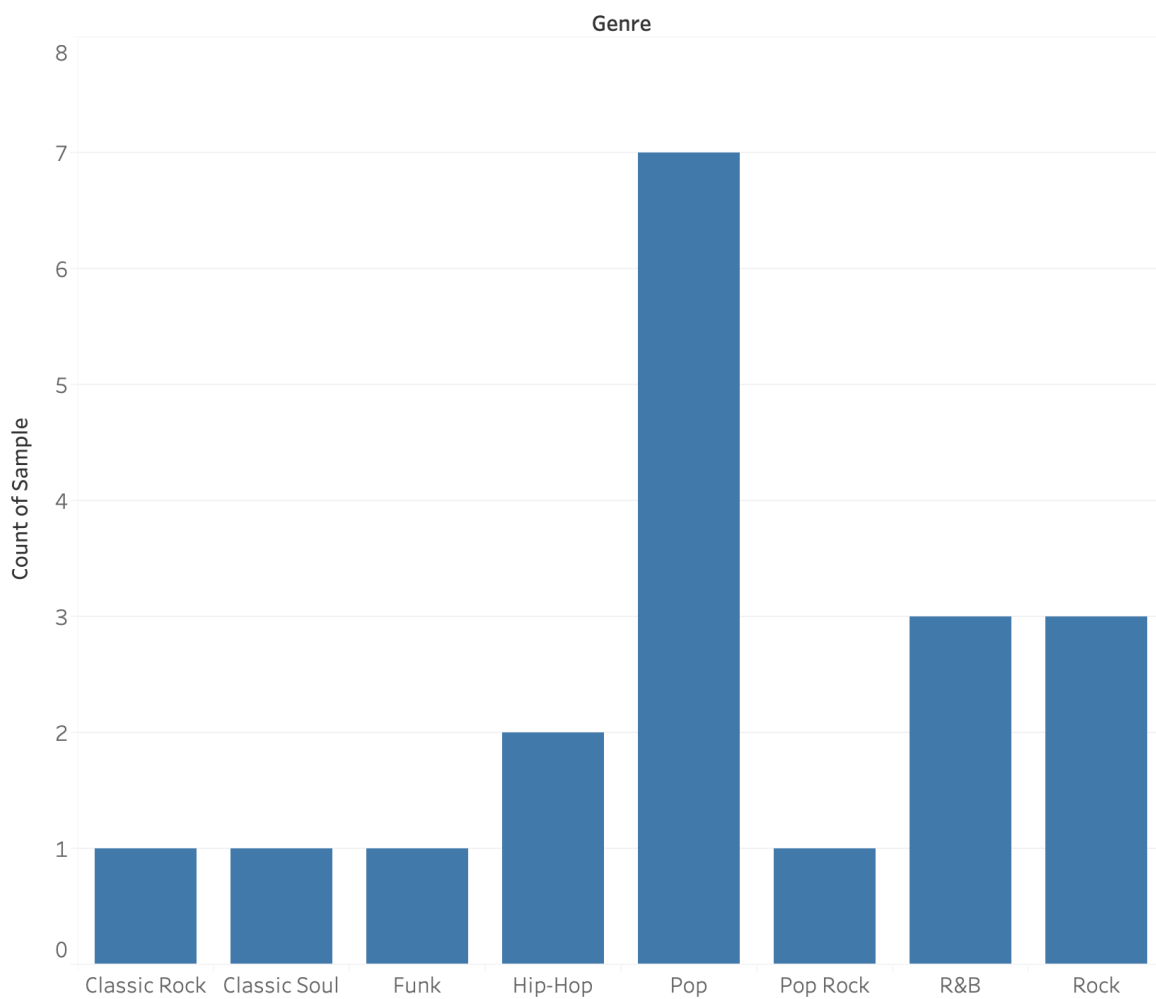


Tableau made us a bar chart!



What if you want to make each bar a different color? Tableau makes it easy to do that, too! Simply click and drag "Genre" out to where it says **Color**.

Tables

Abc Album
Abc Artist
Abc Genre
=Abc Minutes
=Abc Seconds
Abc Song Length
Abc Song Name
Year

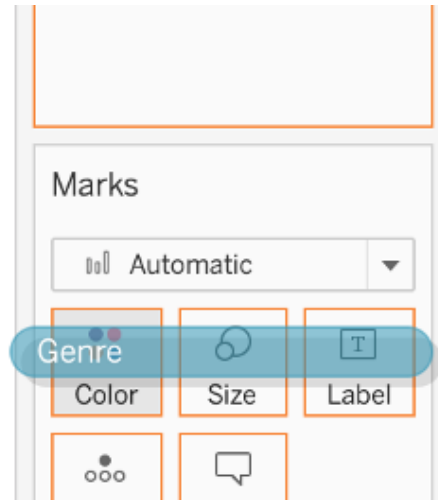
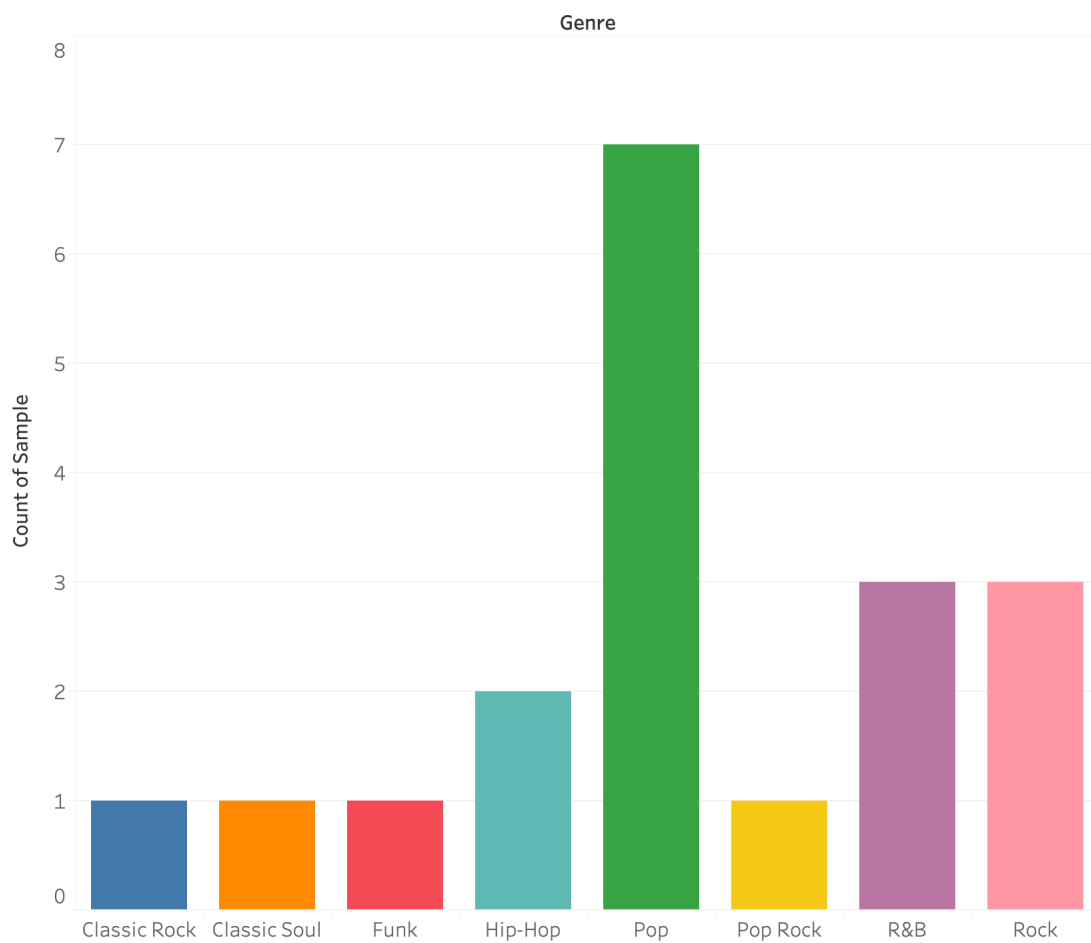
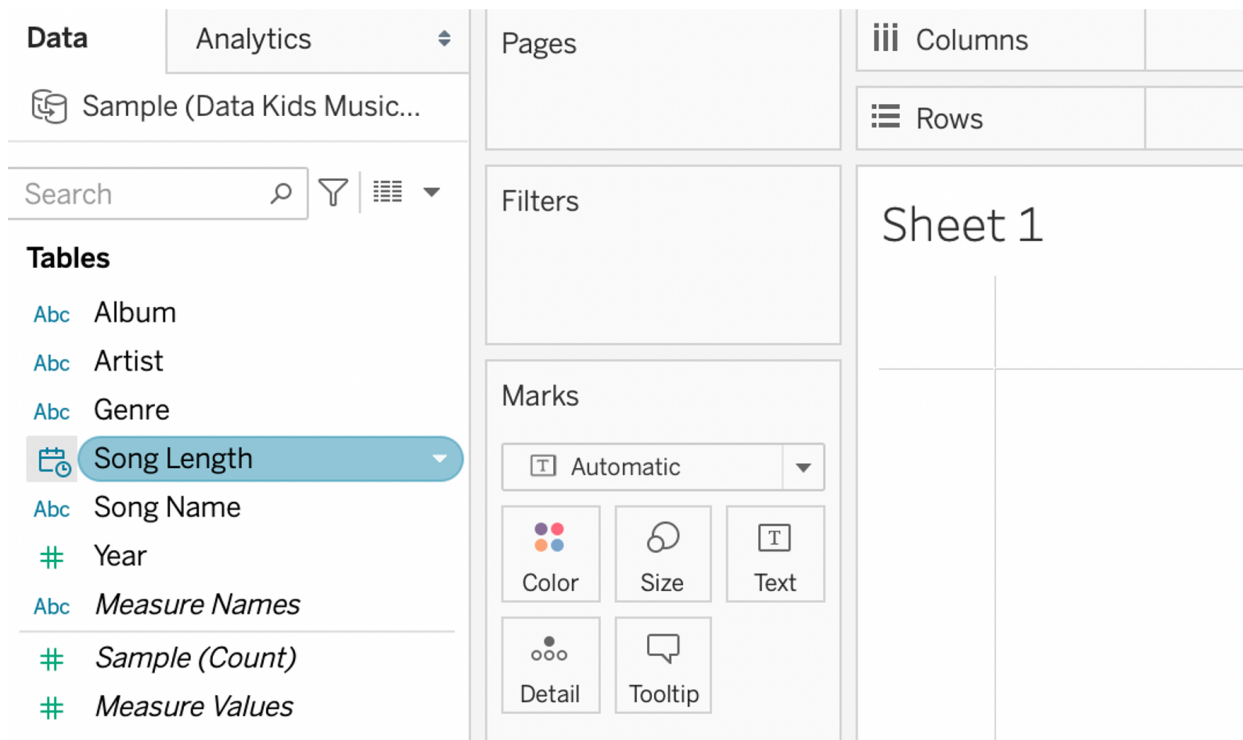


Tableau colored our genres for us!



9) Let's try solving one of the **Advanced** problems. Since our songs are in minute + second format, we'll need Tableau's help converting those minutes into seconds.

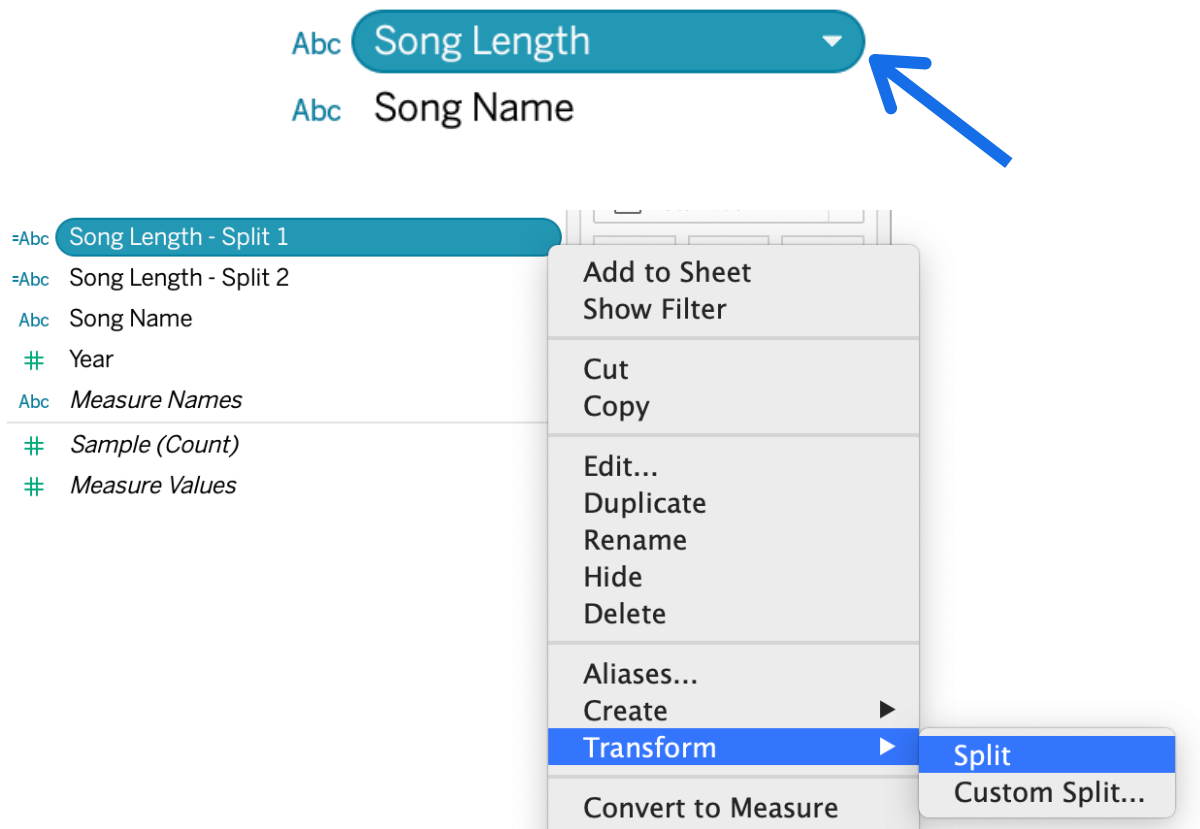
First, hover your mouse over "Song Length" in the left side of the screen. You'll notice the background turns **blue**, and a drop-down arrow appears in the righthand corner.



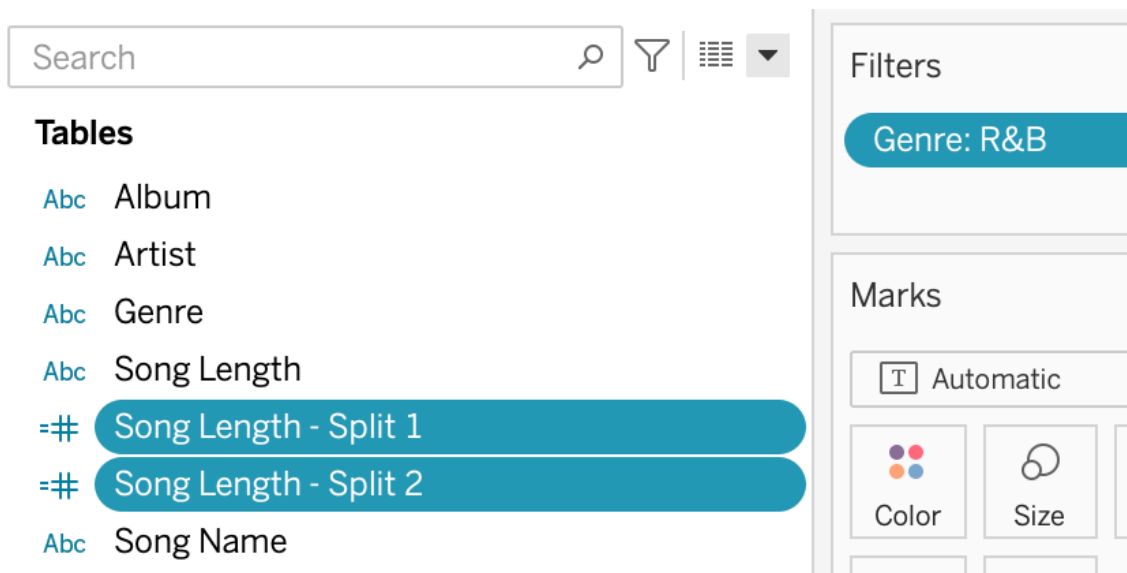
Now click into calendar icon to the left of the word "Song" and select **String**. The calendar icon should change to **Abc**.



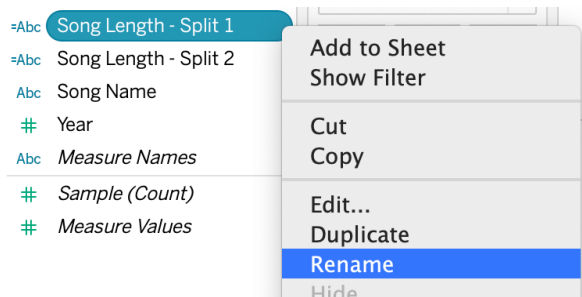
Click the dropdown arrow on the right, hover down to **Transform**, and click **Split**.



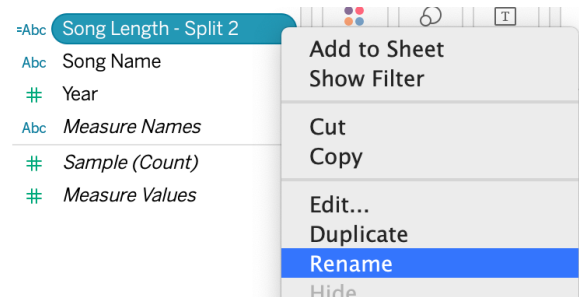
You should have two new fields, "Song Length - Split 1" and "Song Length - Split 2"



Let's rename both so they make a bit more sense. Click into the dropdown menu of "Song Length - Split 1" and **rename** it "Minutes". Then do the same for "Song Length - Split 2", clicking into the dropdown menu and **renaming** it "Seconds".

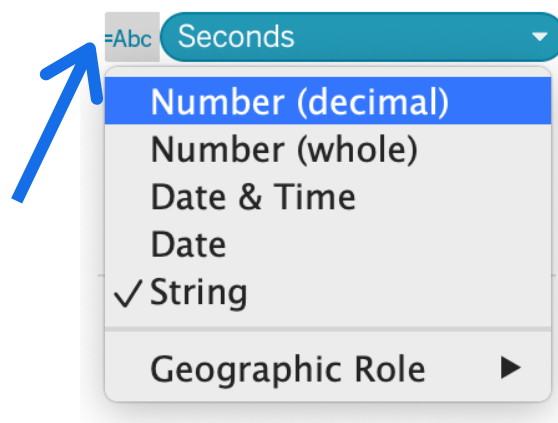
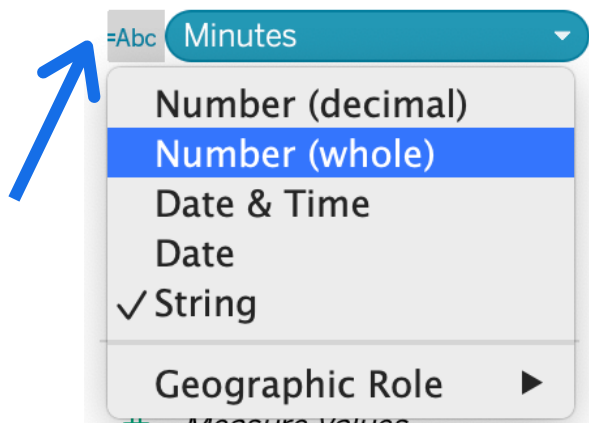


=Abc Minutes
 =Abc Seconds
 Abc Song Length



=# Minutes
 =# Seconds
 Abc Song Length

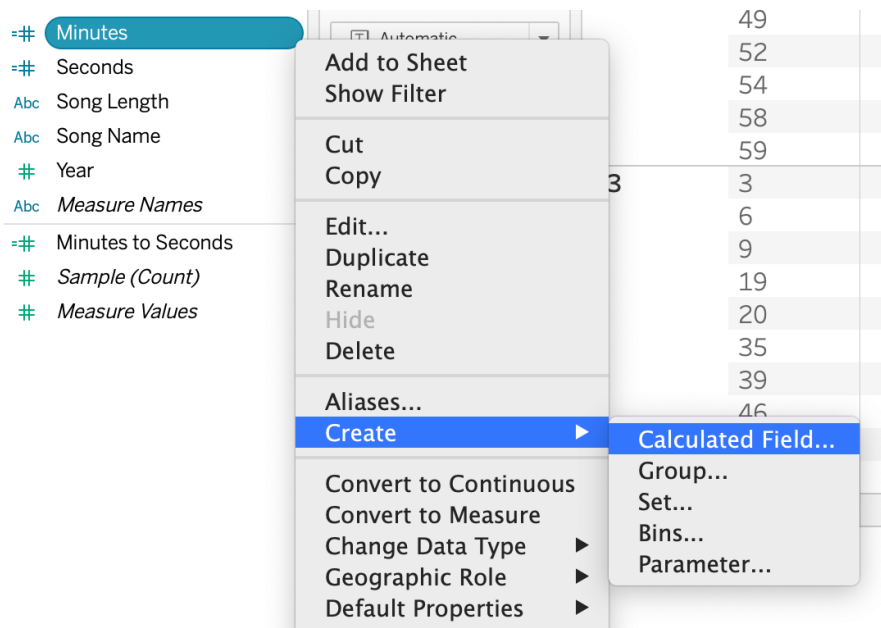
Now click the **Abc** next to the newly renamed "Minutes" field and select **Number (whole)**. Do the same with the "Seconds" field, but select **Number (decimal)** instead.



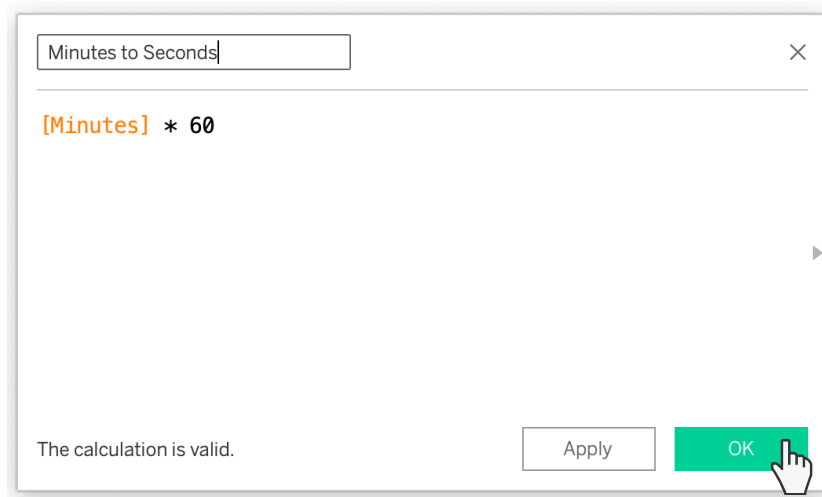
We're ready to calculate! Click the dropdown menu to the right of "Minutes".



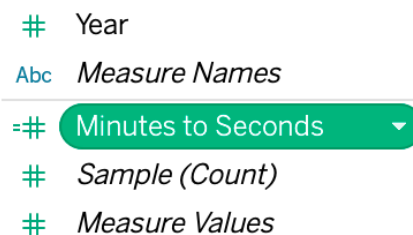
Hover down to **Create**, then click **Calculated Field...**



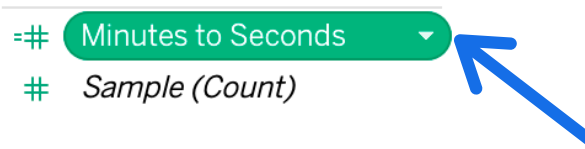
You'll notice a new window pops up. Change the name of the calculation from "Calculation1" to "Minutes to Seconds". Type "*** 60**" next to **[Minutes]** to multiply minutes by 60, since there are 60 seconds per minute. Hit **OK** when finished.



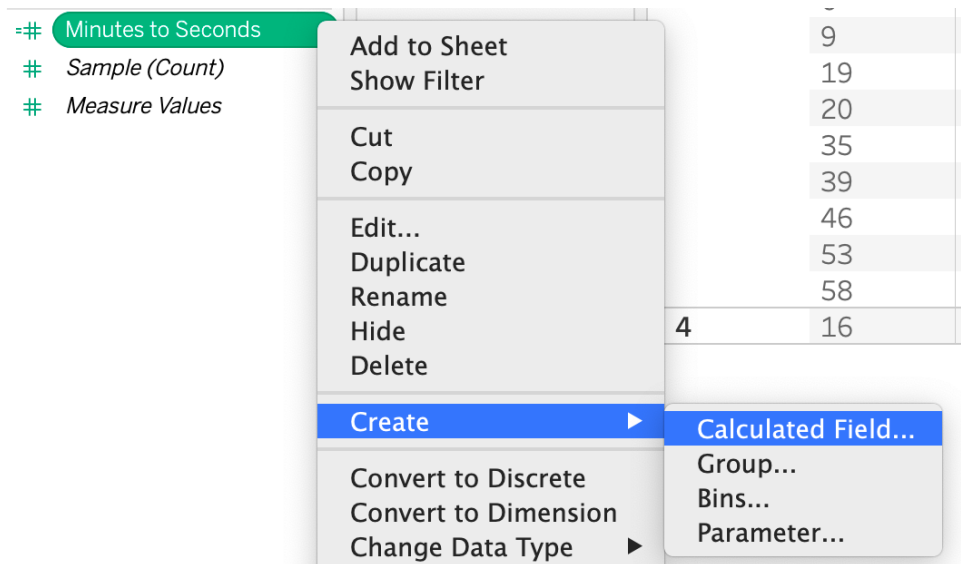
You'll see that Tableau generates a new field. This new field should be **green**!



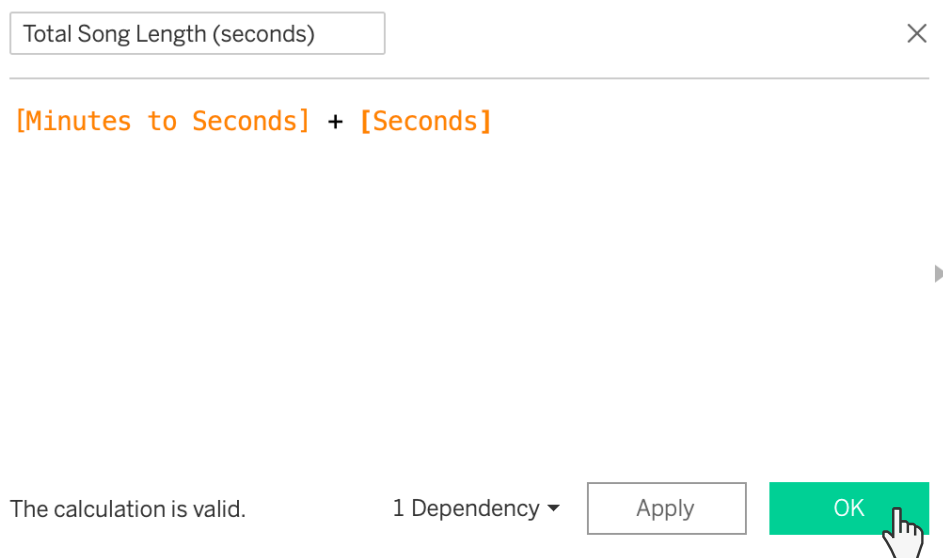
So close! Now click the dropdown menu to the right of "Minutes to Seconds".



Hover down to **Create**, then click **Calculated Field...**



Just like last time, you'll notice a new window pops up. Change the name of the calculation from "Calculation1" to "Total Song Length (seconds)". Type "+ **Seconds**" next to **[Minutes to seconds]** to add the remaining seconds. Hit **OK** when finished.



Now we can visualize! Drag "Song Name" to **Rows** and "Total Song Length (seconds)" to **Columns**.

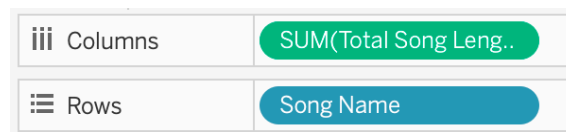
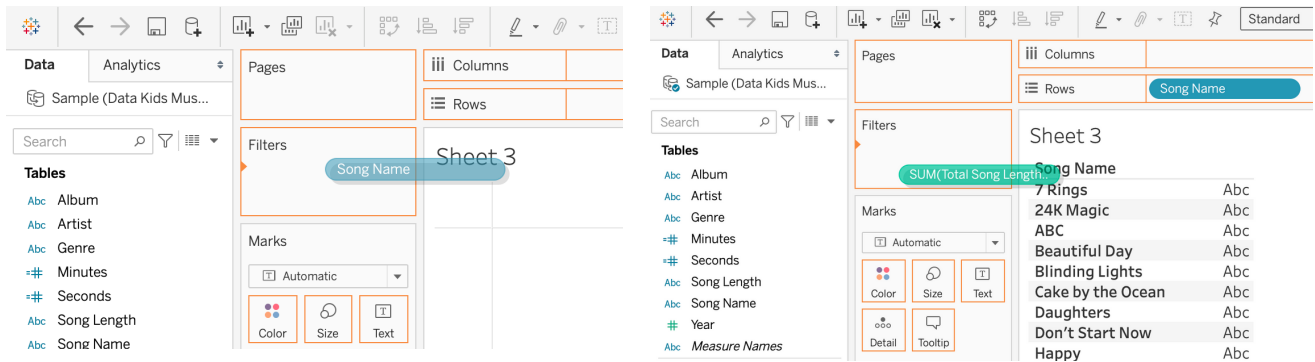
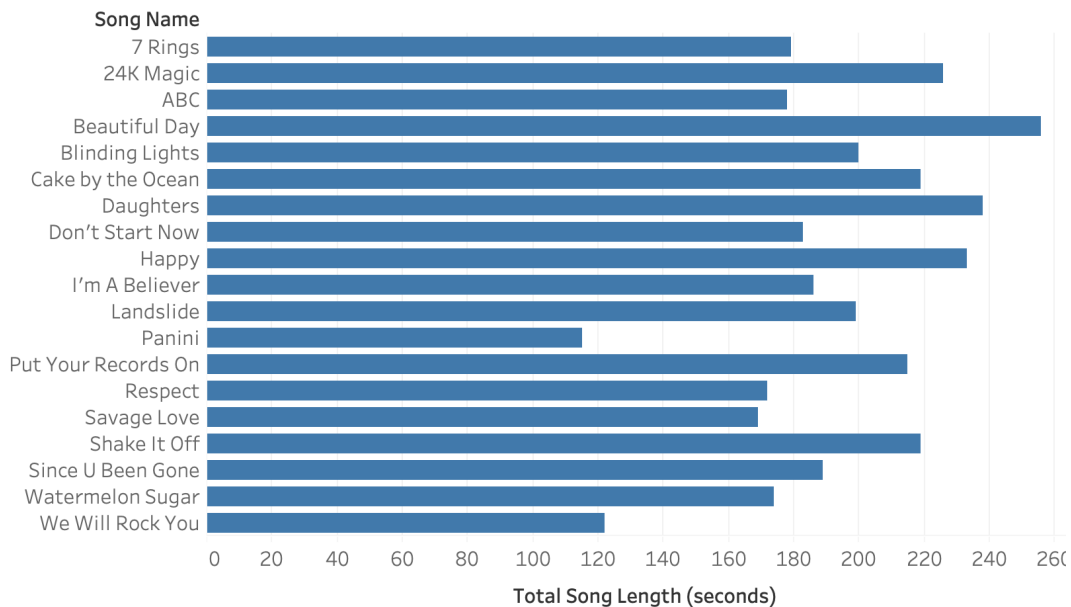
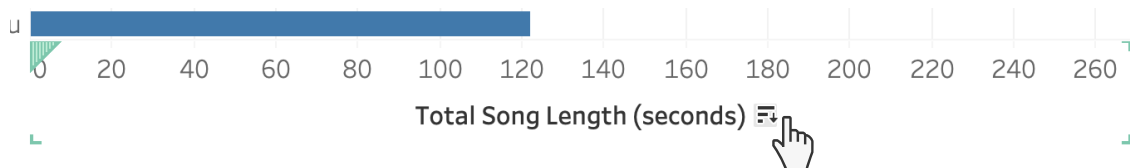


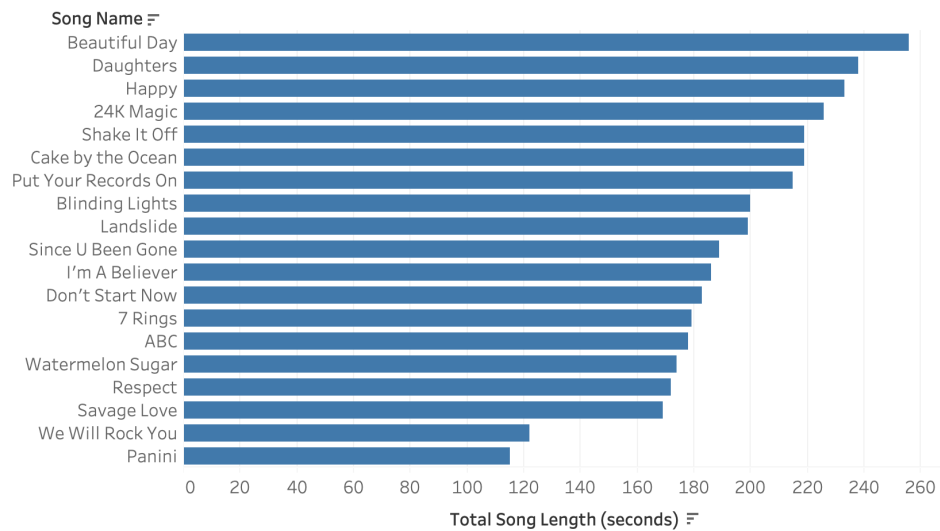
Tableau will create an easy-to-read horizontal bar chart!



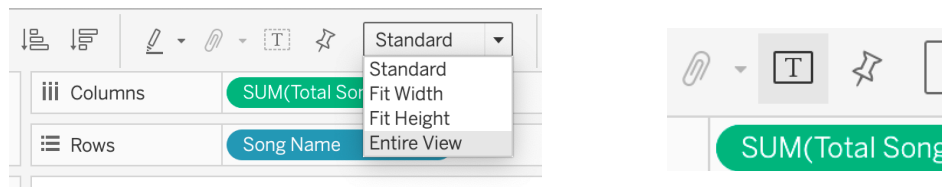
Hover over "Total Song Length" along the x-axis. When you hover, you'll notice an icon with 3 bars and an arrow appears.



Click that icon, and Tableau will sort your data from longest to shortest.



In the top banner above the green "SUM(Total Song Length)" field, click into the dropdown arrow next to the word **Standard** and select **Entire View**. Then, click the T icon to the left of that dropdown.



Ta-da! Tableau has now sorted and labeled all of your songs, showing you not only which song is the longest, but also the total time in seconds for each song in your dataset.

No calculator necessary!

