Lab 5. Tableau Desktop Advanced Filtering

In this lab, we will cover the following topics:

- Implementing a top N filter
- Adding filters to context
- Creating a measure filter
- Creating date range filters
- Creating relative date filters
- Implementing table calculation filters
- Implementing action filters

Introduction

In this lab, we will mostly be using the `Winery.csv` dataset, originally found on Kaggle.com. It contains data on wines which winery they belong to, which province they originate from, number of points, price of the wine, and the name of the wine taster who rated them, among other details.

In the two recipes dealing with date filters, [*Creating date range filters*] and [*Creating relative date filters,*] we will be using the `Bread_basket.csv` dataset, which contains transactions from a bakery with their dates. This dataset was also originally found on Kaggle.com.

Implementing a top N filter

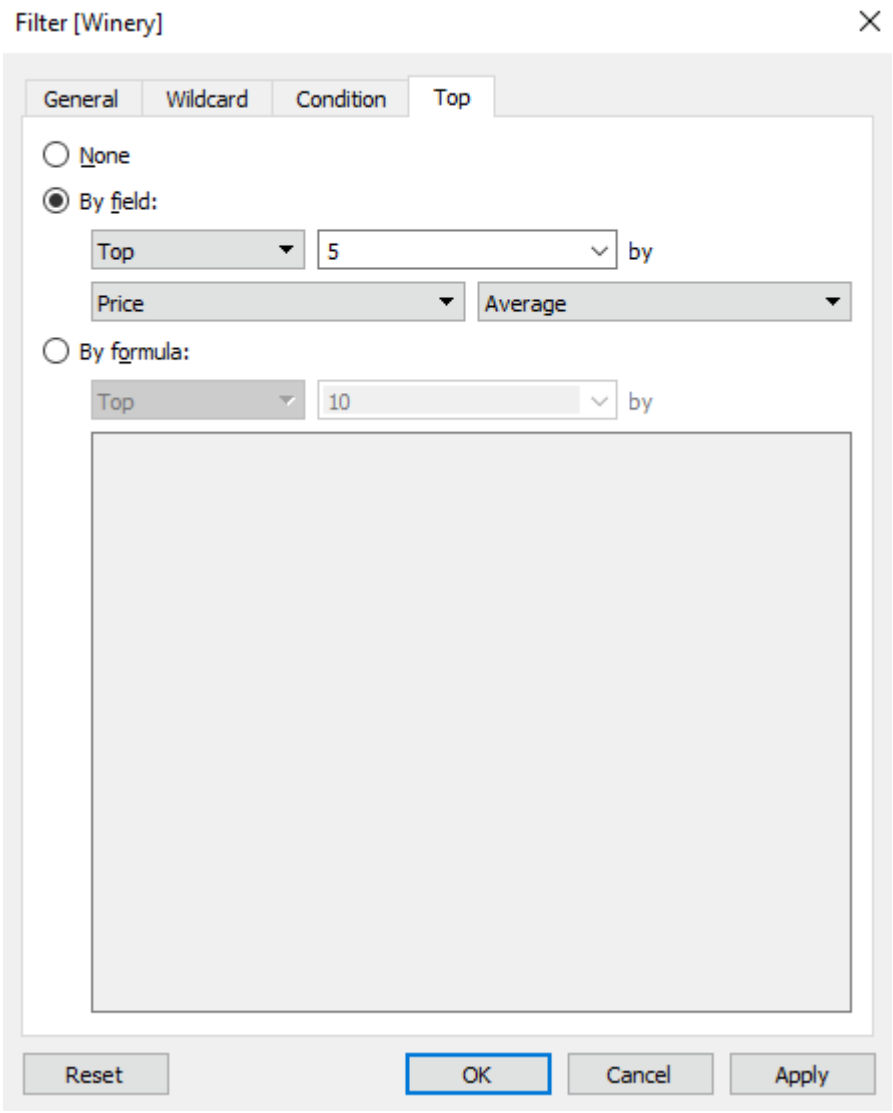
Top N filtering allows you to filter only the top N members of a dimension, which is determined by their value in another field you select.

Getting ready

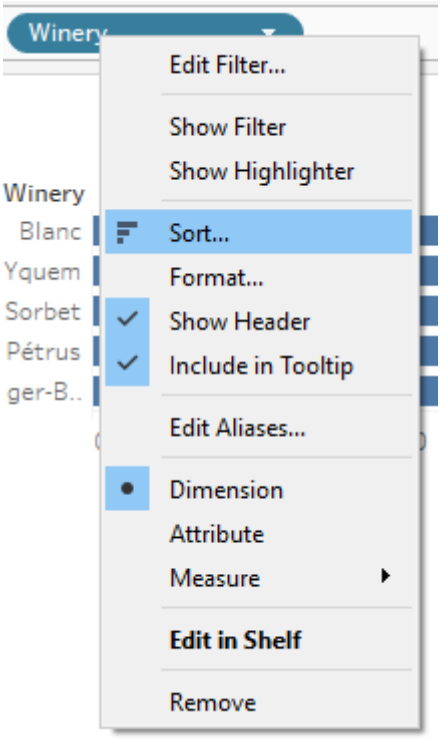
To follow the steps In this lab, you will need to connect to the `Winery.csv` dataset, and open a new blank worksheet.

How to do it...

1. Drag and drop **`Winery`** from **`Dimensions`** into the **`Rows`** shelf.
2. Drag and drop **`Price`** from **`Measures`** into the **`Columns`** shelf.
3. Right-click on the **`SUM (Price)`** pill in the **`Columns`** shelf, navigate to **`Measure (Sum)`**, and select **`Average`**.
4. Drag and drop **`Winery`** from **`Dimensions`** into the **`Filters`** shelf.
5. In the **`Filter [Winery]`** window, navigate to the **`Top`** tab.
6. Select **`By field`**, and change top **`10`** to top **`5`** by entering the value `5` in the box, as follows:

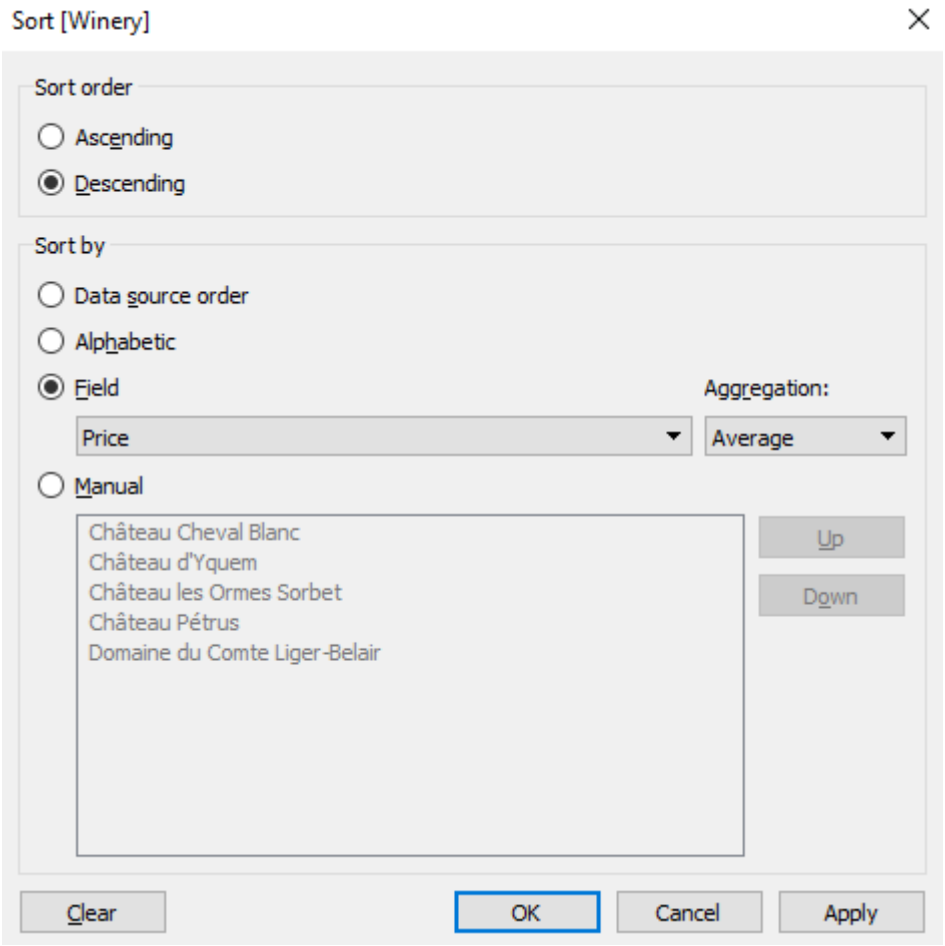


7. Click `OK` to exit the window.
8. Finally, let's sort our view by price. Right-click on the `Winery` pill in the `Rows` shelf and select `Sort...`, as follows:

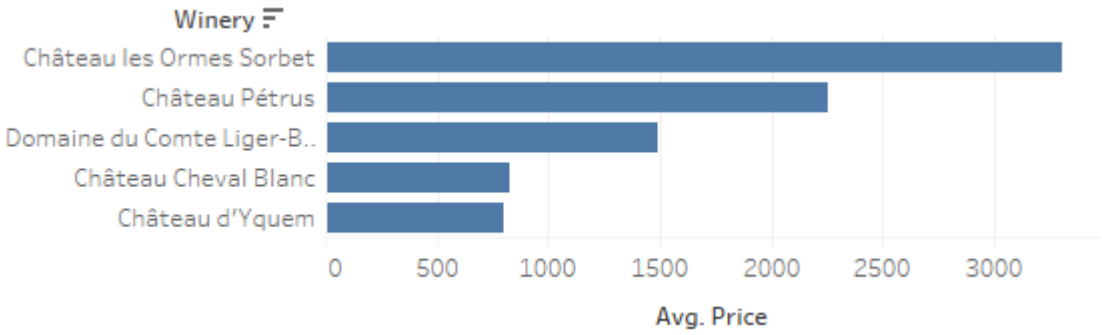


9. In the **`Sort [Winery]`** window, under **`Sort Order`**, select **`Descending`**.

10. Under **`Sort By`**, select **`Field`**, and make sure it is set to **`Price`** under **`Field Name`** and to **`Average`** under **`Aggregation`**, as follows:



11. Click** `OK` ** to exit the window. Our view now shows only the top five wineries by the average price of their wines, as shown in the following screenshot:

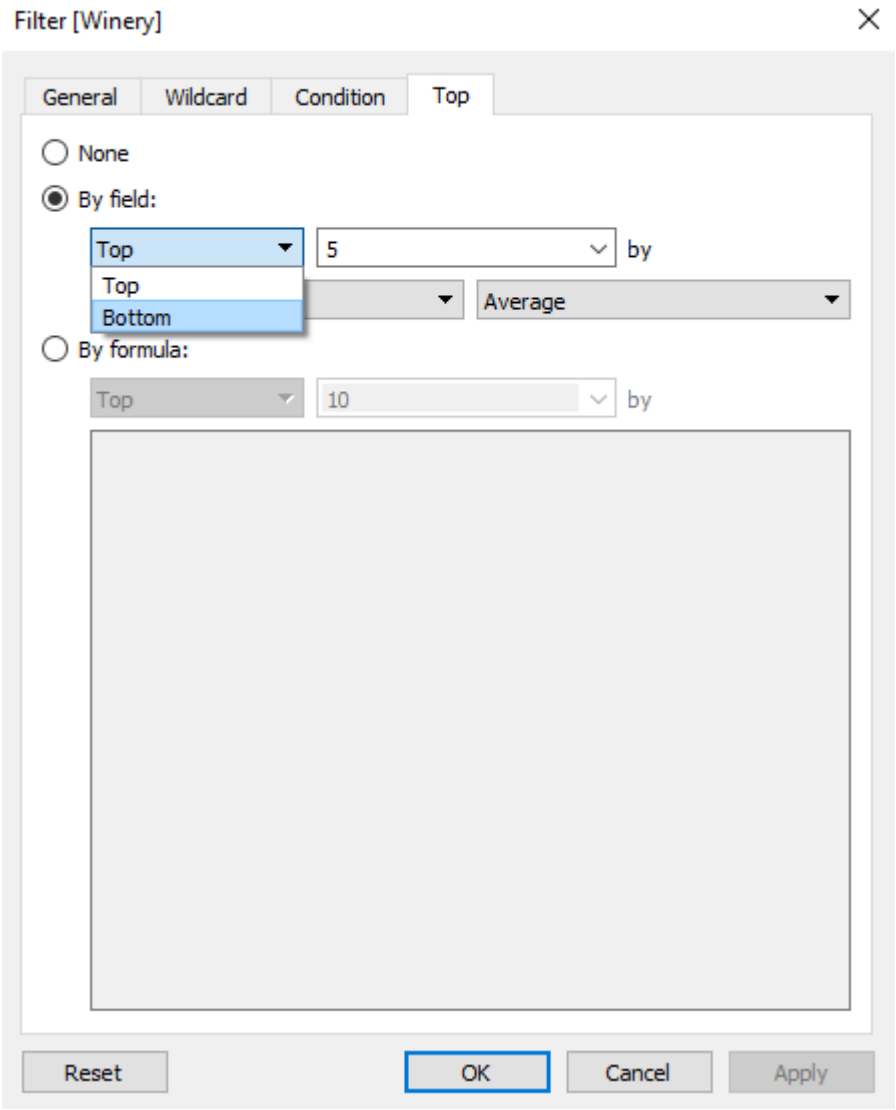


How it works...

We have selected the top five wineries by the average price of their wines. Although the filter is by a dimension in this case, **`Winery`** we also needed to include a measure (in this case, **`Price`**) by which to select the top five wineries.

There's more...

Besides choosing the top N members of a dimension, Tableau also allows us to choose the bottom N. In the `Filter [Winery]` window, click on the `Top` drop-down menu and select `Bottom`, as shown in the following screenshot:



It is also possible to filter the top/bottom N members by custom formula. In the `Filter [Winery]` window, select `By formula`, and Tableau will allow you to type in your custom expression to filter by.

Adding filters to context

In the previous recipe, [*Implementing a top N filter*], we learned how to create a top N filter. In this lab, we will expand that knowledge to situations where we have multiple filters, a top N filter being one of them.

In these situations, we can get a different output to what we expect. We will learn how to properly set up our filters so that the output is what we want it to be.

Getting ready

Follow the previous recipe, [*Implementing a top N filter*], to create the worksheet we will be working on In this lab.

How to do it...

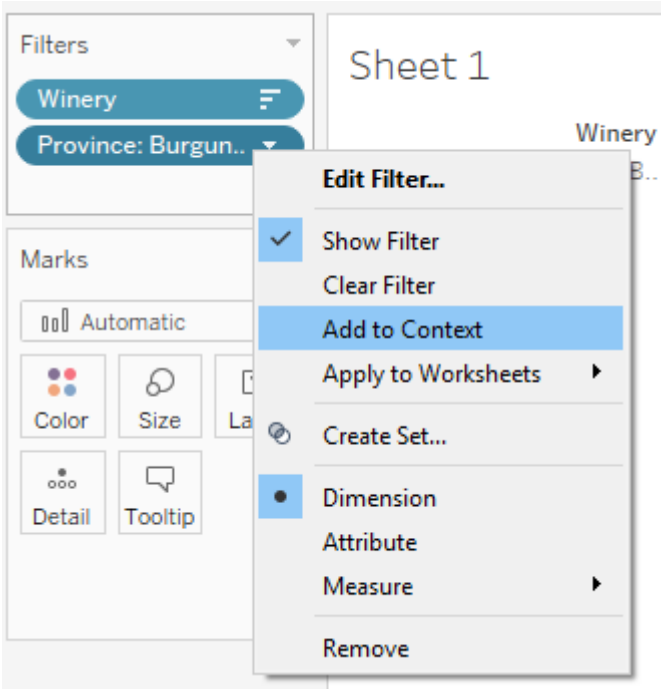
1. Let's add a filter by **`Province`** to filters. Drag and drop **`Province`** from **`Dimensions`** to the **`Filters`** shelf.
2. In the **`Filter [Province]`** window, click **`All`** beneath the list of regions to select all regions.
3. Click **`OK`** to exit the window.
4. Right-click on the ** `Province` **pill in the **`Filters`** shelf and, from the drop-down menu, select **`Show Filter`** .
5. Let's say we want to see the top five wineries by price in the province of Burgundy. From the **`Province`** filter, select **`Burgundy`** .

Note

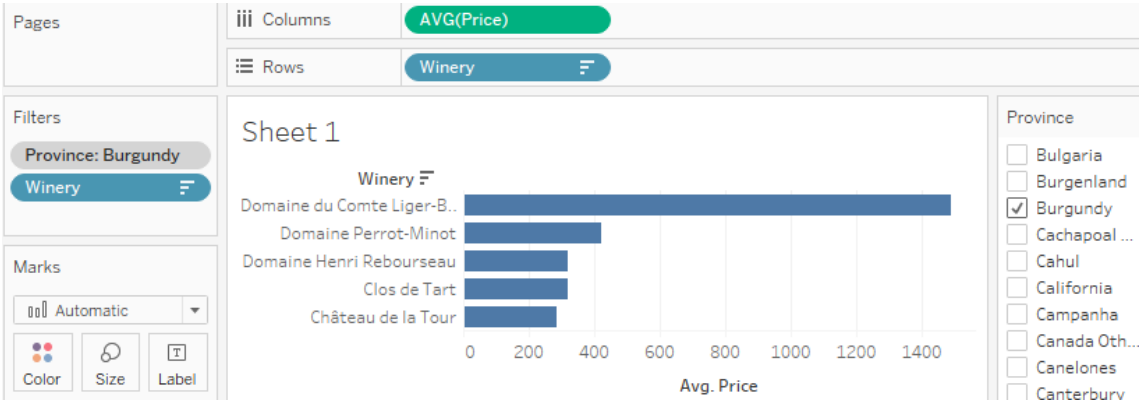
You can start typing `Burgundy` to narrow your choices.

6. However, this selection doesn't give us the expected result---our view is only displaying one winery now, instead of five:

7. To correct that, right-click on the **`Province: Burgundy`** pill in the **`Filters`** shelf and, from the drop-down menu, select **`Add to Context`** :



In the following screenshot, the chart is now showing the top five wineries in the province of `Burgundy`:



How it works...

We started from a view showing the top five wineries by the average price of their wines. Then, we added the filter by `Province`, in order to see the top five wineries per province. However, the result we got was not what we wanted---when we selected the region of Burgundy, we got the winery that is in the top five wineries at the level of the total sample, which is also in the province of Burgundy.

We achieved the output we desired when we added the `Province` filter to context---now, our view shows the top five wineries within each region. What changed when we added the `Province` filter to context?

By adding the `Province` filter to context, we gave it priority over the top N filter. Context filters are filters that set the context in which other filters are applied. They take priority over the other filter(s) in the view, which are applied only on rows that have been filtered by the context filters.

There's more...

Context filters can also be used to boost performance of the view in cases of multiple filters or very large data sources, which would normally be slowed down by an additional filter.

Creating a measure filter

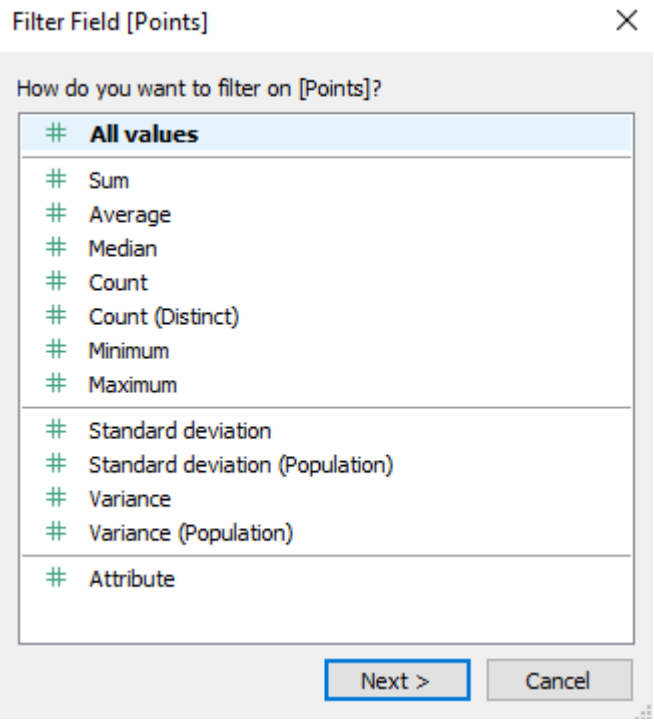
So far, we have been filtering our views using dimensions as filter fields. However, Tableau also allows us to filter views by measures. In this lab, we will be exploring the possibilities of this feature.

Getting ready

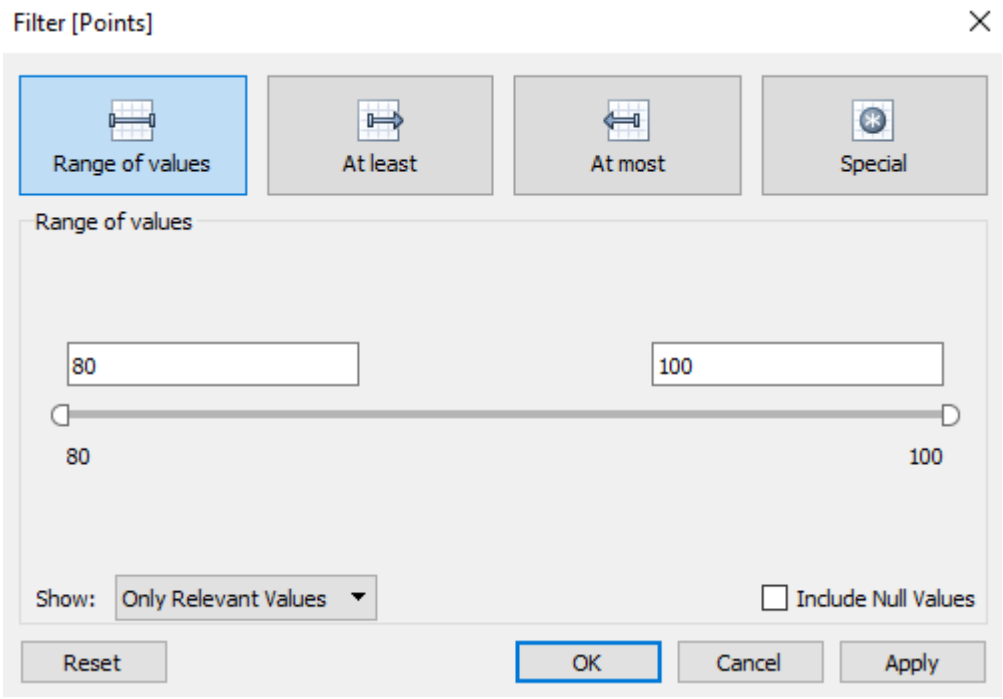
Connect to the `Winery.csv` dataset, and open a new blank worksheet.

How to do it...

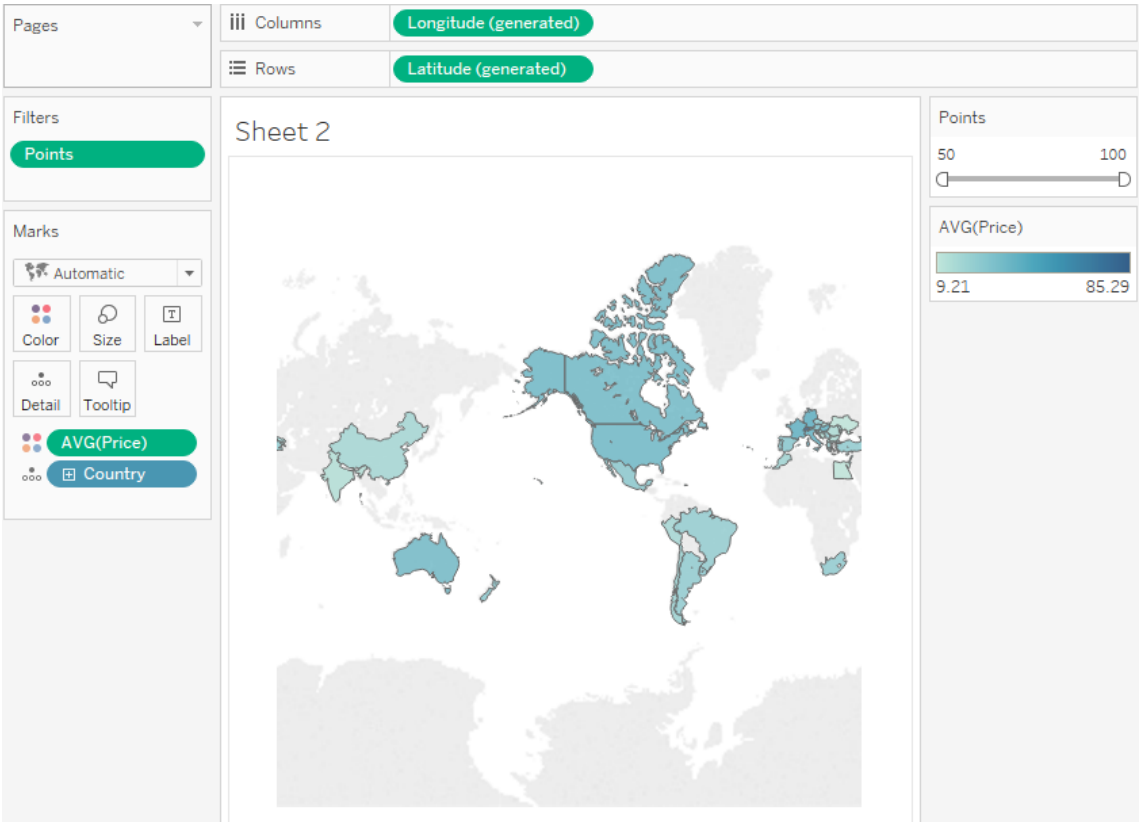
1. Drag and drop **`Country`** from **`Dimensions`** into the canvas.
2. Drag and drop **`Price`** from **`Measures`** onto **`Color`** in the **`Marks`** bar.
3. Right-click on the **`SUM (Price)`** pill in **`Color`**, navigate to **`Measure (Sum)`** and, from the drop-down menu, select **`Average`**.
4. Drag and drop **`Points`** from **`Measures`** into the **`Filters`** shelf.
5. In the **`Filter Field [Points]`** window, select **`All values`** and click **`Next >`**:



6. In the **`Filter [Points]`** window, leave the **`Range of values`** option as its default (**`80`** to **`100`**), and click **`OK`**:



7. Right-click on the `Points` pill in the `Filters` shelf, and select `Show Filter`. When the filter control slider appears in the top-right corner of the worksheet, try moving the slider to select a different range of values. Different countries will be highlighted based on the selected range, as shown in the following screenshot:



How it works...

We have chosen to filter our view by the number of **`Points`**. We have turned on filter control so that we can select the range of **`Points`** we want to include in the view. When we change the number of **`Points`**, countries that are displayed stay the same, but the color changes. That's because different rows get included in the view.

For example, when we set the range of **`Points`** to 85-90, the **`Price`** is only calculated on the rows that satisfy the condition specified by the filter---that is, where **`Points`** are between 85 and 90. So, the average price that is presented in the changes as different rows are being excluded and included in the view by the filter.

There's more...

When filtering a view by measures, we can also select the **`At least`** and **`At most`** options.

The **`At least`** option keeps the maximum value at the maximum value in our dataset, while we can adjust the lowest value. The **`At most`** option provides the opposite---the minimum value is kept at the minimum value available in the dataset, while we can adjust the highest value.

Creating date range filters

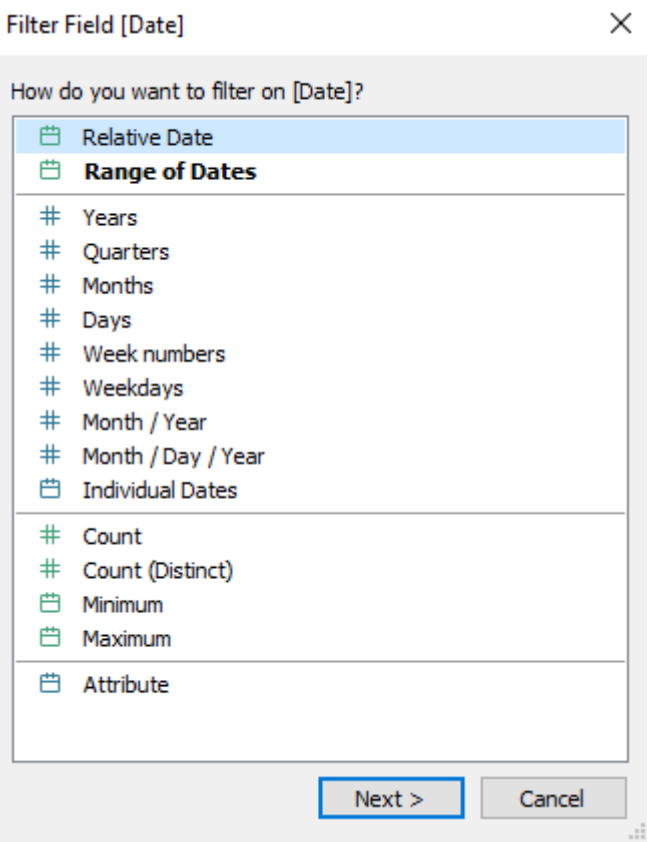
Tableau recognizes dates as a special data type, and has specific filtering functionalities related to dates. This recipe will go through the steps of filtering data by date range.

Getting ready

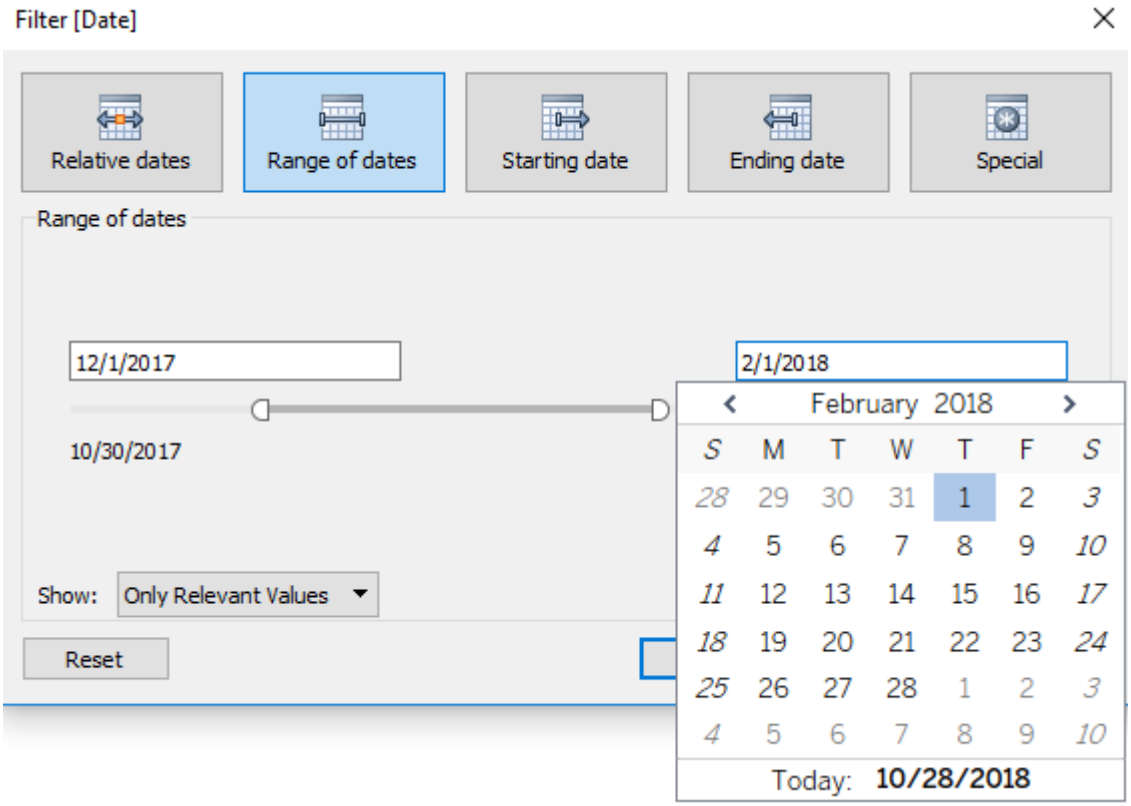
To perform the steps In this lab, connect to the `Bread_basket.csv` dataset and open a new blank worksheet.

How to do it...

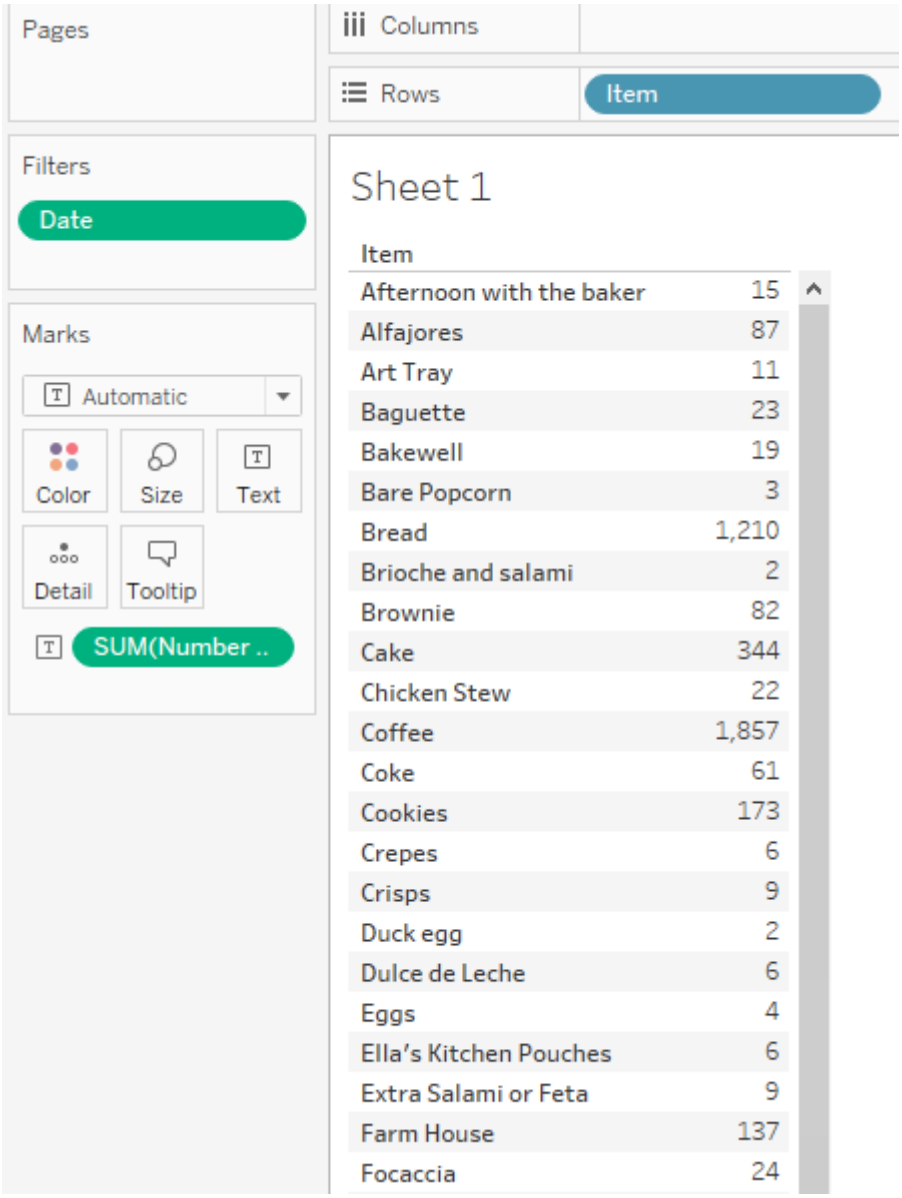
1. Drag and drop `Item` from `Dimensions` into the `Rows` shelf.
2. Drag and drop `Number of Records` from `Measures` onto `Text` in the `Marks` card.
3. Now, let's filter our view by date range. Drag and drop `Date` from `Dimensions` into the `Filter` shelf.
4. In the `Filter Field [Date]` window, select `Range of Dates`, and click `Next >`:



5. In the `Filter [Date]` window that opens, select the desired date range. For this example, let's select data from 12/1/2017 through 2/1/2018. Click on the date field on the left-hand side, and select `12/1/2017` from the drop-down calendar. Repeat the same steps in the right-hand field to select the end date--- `2/1/2018`, as shown in the following screenshot:



6. Click `OK` to exit the window. Our view is now showing only the data for the time period we selected:



How it works...

In this lab, we chose to select all of the records in our dataset that fall within a certain date range. We specified the start date and the end date, and Tableau filtered out all dates that fall out of this range.

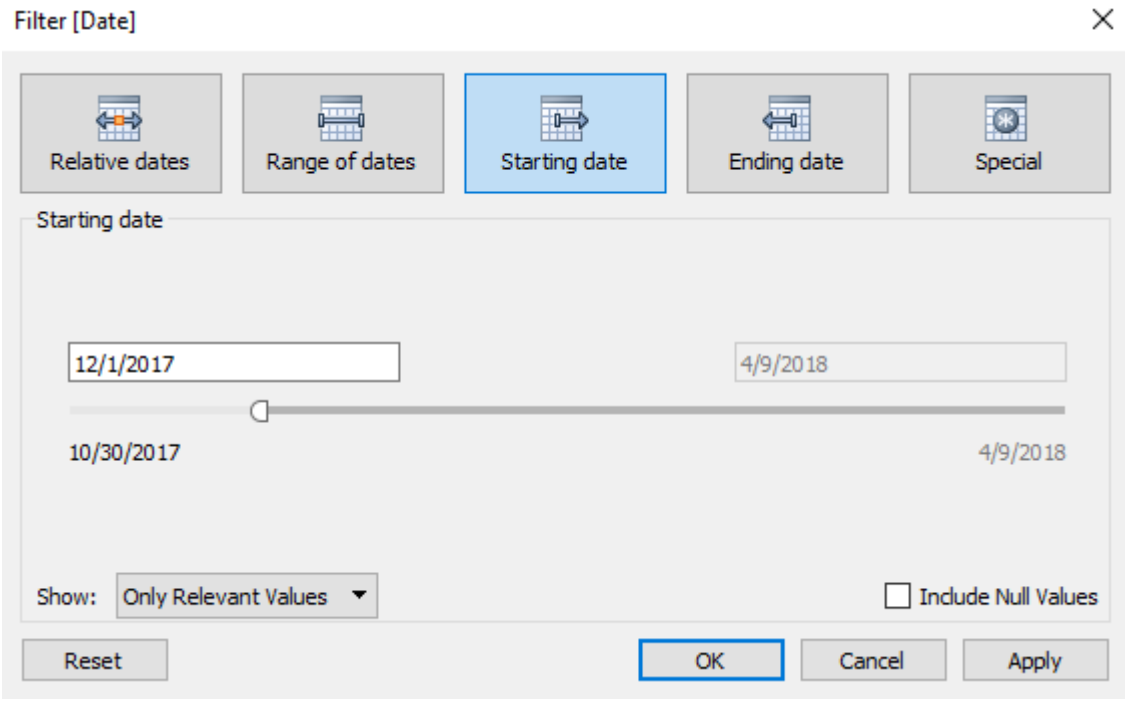
Although date filters are specific for the data field type, they work just like any other filter. When we specified the range of dates, Tableau filtered out all of the rows in our data source that contain date values that are outside the specified range, and included only the rows with the date values that fall within the specified range in our view.

There's more...

When filtering by date range, Tableau also offers the options `Starting date` and `Ending date`.

When we choose `Starting date`, we set the earliest date in our date range, while the end date is set to the latest date available in the data source.

Let's view what we have selected in the following screenshot:



On the other hand, with the **`Ending date`** option, we set the latest date in the date range that we would like to filter by, while the starting date is set to the earliest available date in our data source.

Creating relative dates filters

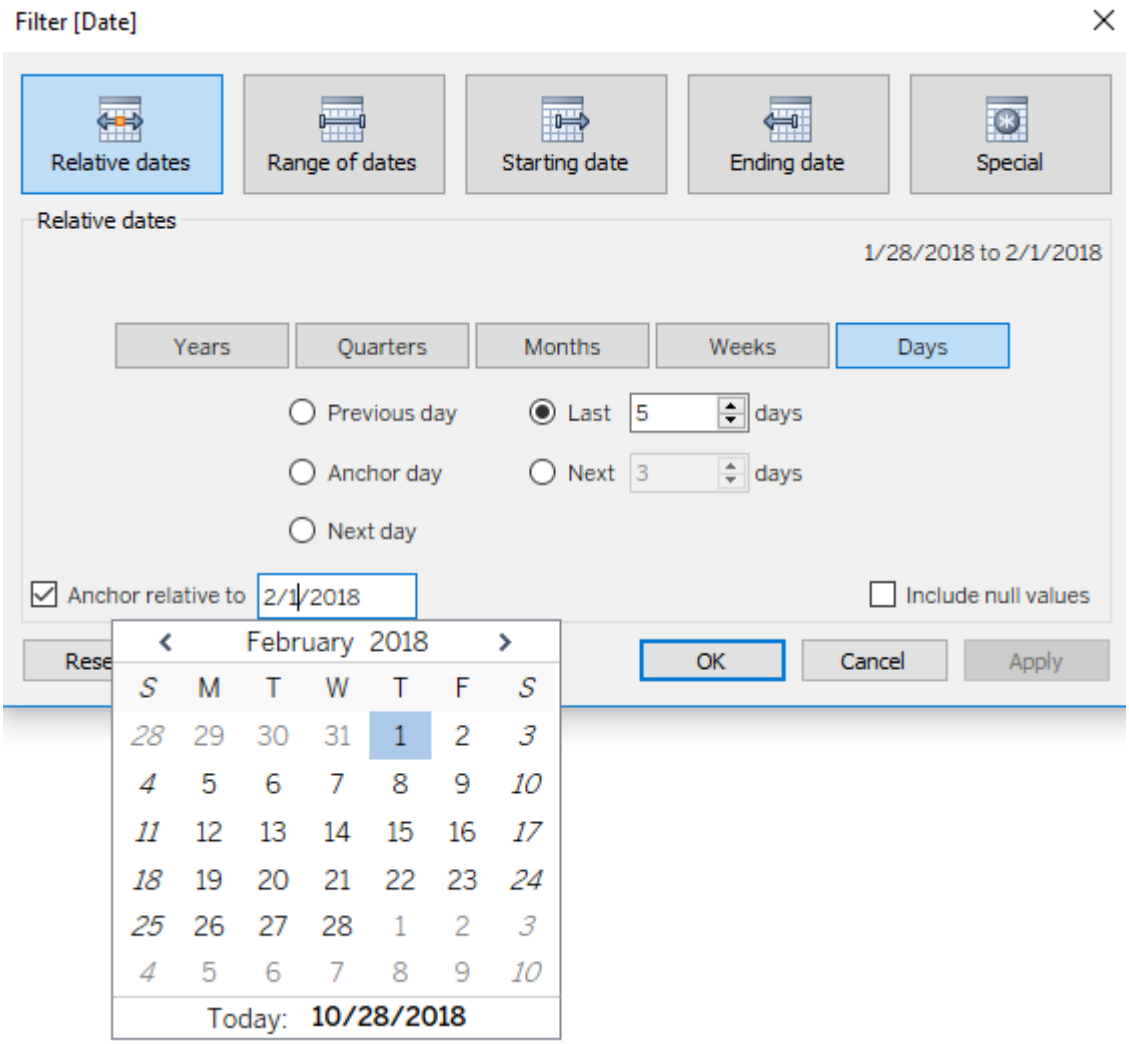
In the previous recipe, [*Creating date range filters*], we created a date range filter. In this lab, we will explore another kind of date filter---a relative date filter. Relative date filters allow us to filter dates that are relative to a selected date.

Getting ready

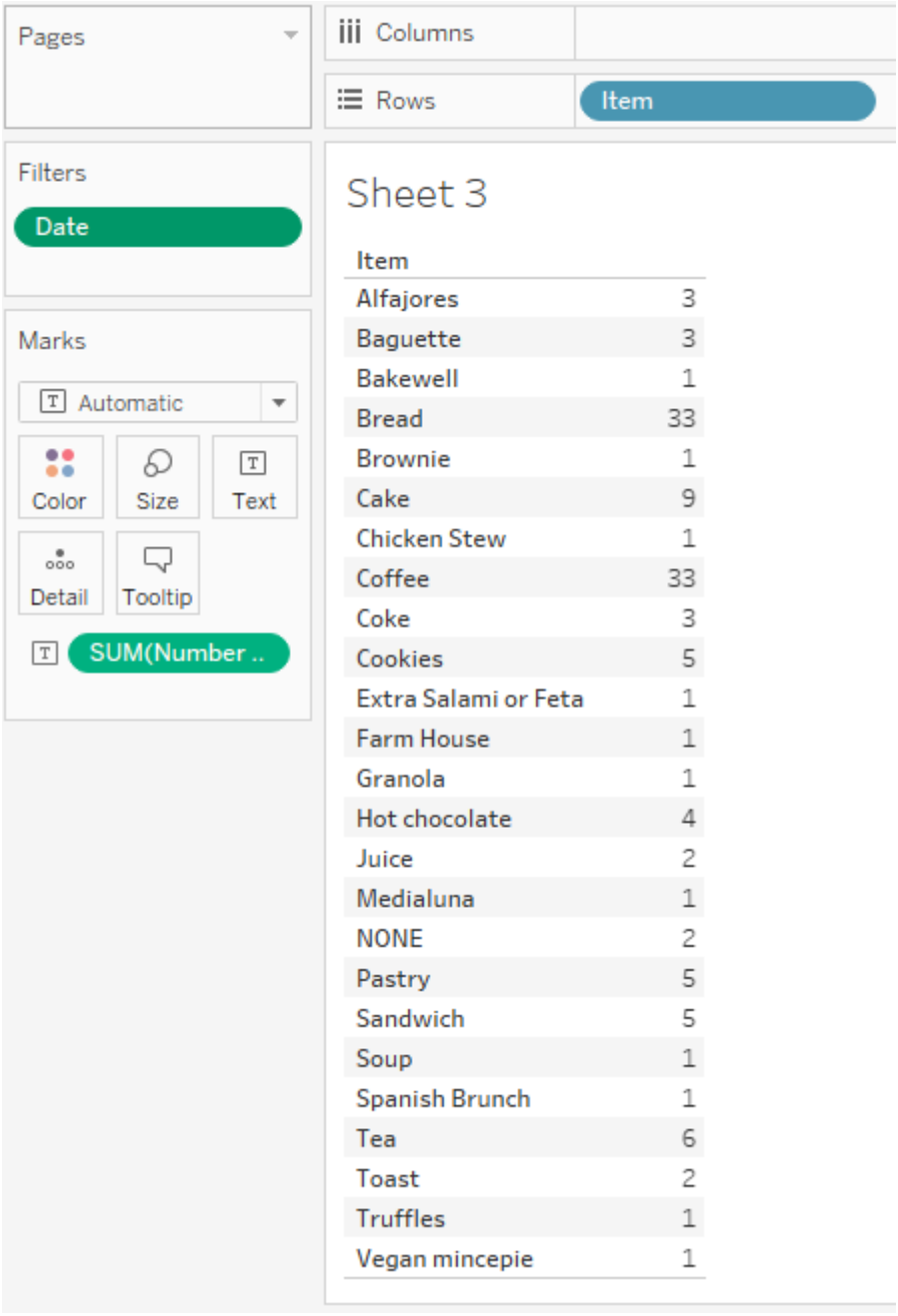
To follow the steps outlined In this lab, connect to the `Bread_basket.csv` dataset, and open a new blank worksheet.

How to do it...

1. Right-click on the previously created **`Date`** filter and select **`Edit...`**.
2. In the **`Filter [Date]`** window, select the **`Relative dates`** option.
3. Select the period you would like to see. Let's set the last five days. Select the radio button in front of **`Last`**, and type `5` in the associated box.
4. In the bottom-left corner, check the box in front of **`Anchor relative to`** and choose a date, being careful that it's actually included in our dataset. For example, let's select **`2/1/2018`** by clicking on the date field and selecting the date from the drop-down calendar. We can view our selection in the following screenshot:



5. Click `OK` to exit the window. You can see the generated output in the following screenshot:



Item	
Alfajores	3
Baguette	3
Bakewell	1
Bread	33
Brownie	1
Cake	9
Chicken Stew	1
Coffee	33
Coke	3
Cookies	5
Extra Salami or Feta	1
Farm House	1
Granola	1
Hot chocolate	4
Juice	2
Medialuna	1
NONE	2
Pastry	5
Sandwich	5
Soup	1
Spanish Brunch	1
Tea	6
Toast	2
Truffles	1
Vegan mincepie	1

How it works...

In this lab, we explored relative date filters, by creating a filter relative to a random date we chose, that is, `2/1/2018`. We chose the date, and we chose to see the last five days relative to the chosen date. Our view is now showing the selected number of days relative to the chosen date.

There's more...

When working with relative date filters, Tableau allows a multitude of options. As well as specifying the number of days, we can also choose to show the selected number of years, quarters, months, or weeks relative to the selected date. Besides this, we can show not only a time period preceding the selected date, but also the one following it, by choosing **`Next`** instead of **`Last`**.

Finally, besides setting a fixed date as we did In this lab, we can also choose **`Today`**, **`Yesterday`**, or **`Tomorrow`** as the anchor dates, which is very useful when we want to have a view that is updated with fresh data relative to the current date.

Implementing table calculation filters

When table calculations are included in the view, filtering can be tricky as it changes table calculations and can give us undesired results.

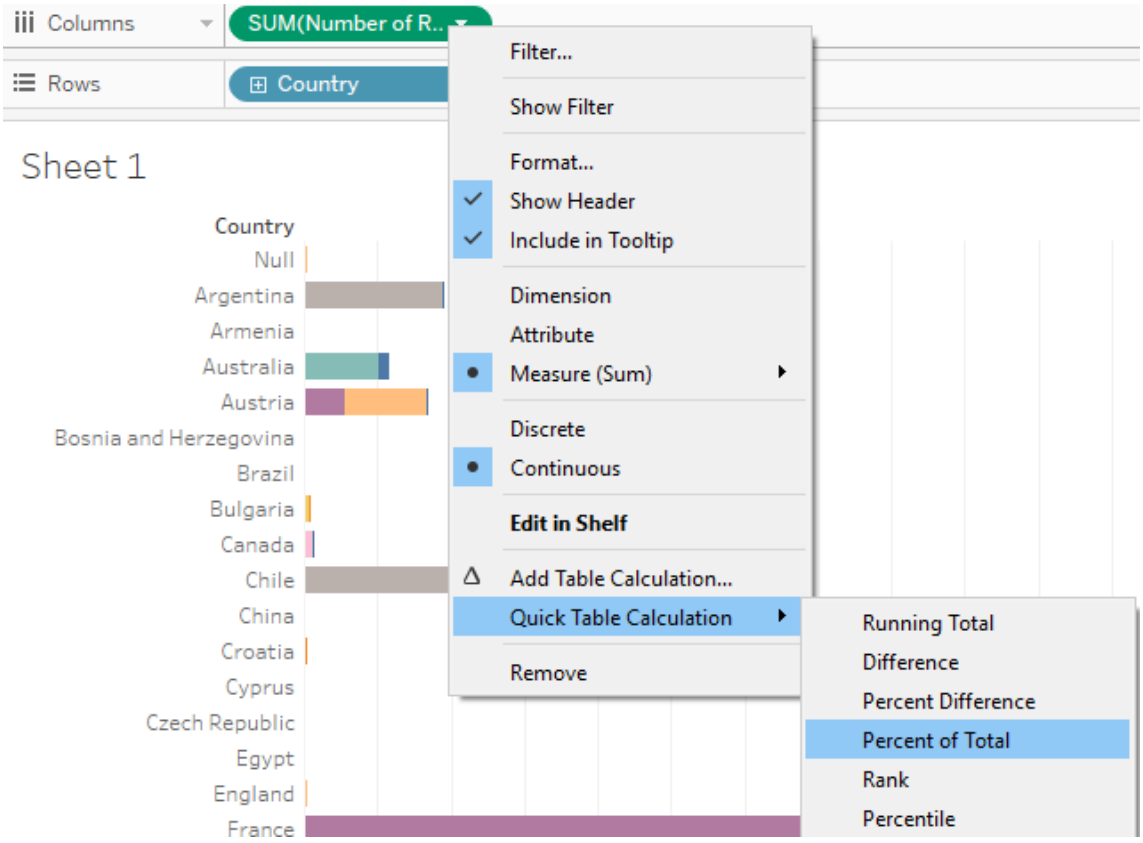
In this lab, we will go through an example of what can happen when we filter a view that includes table calculation, and an easy way to include a table calculation filter that will give us the desired result.

Getting ready

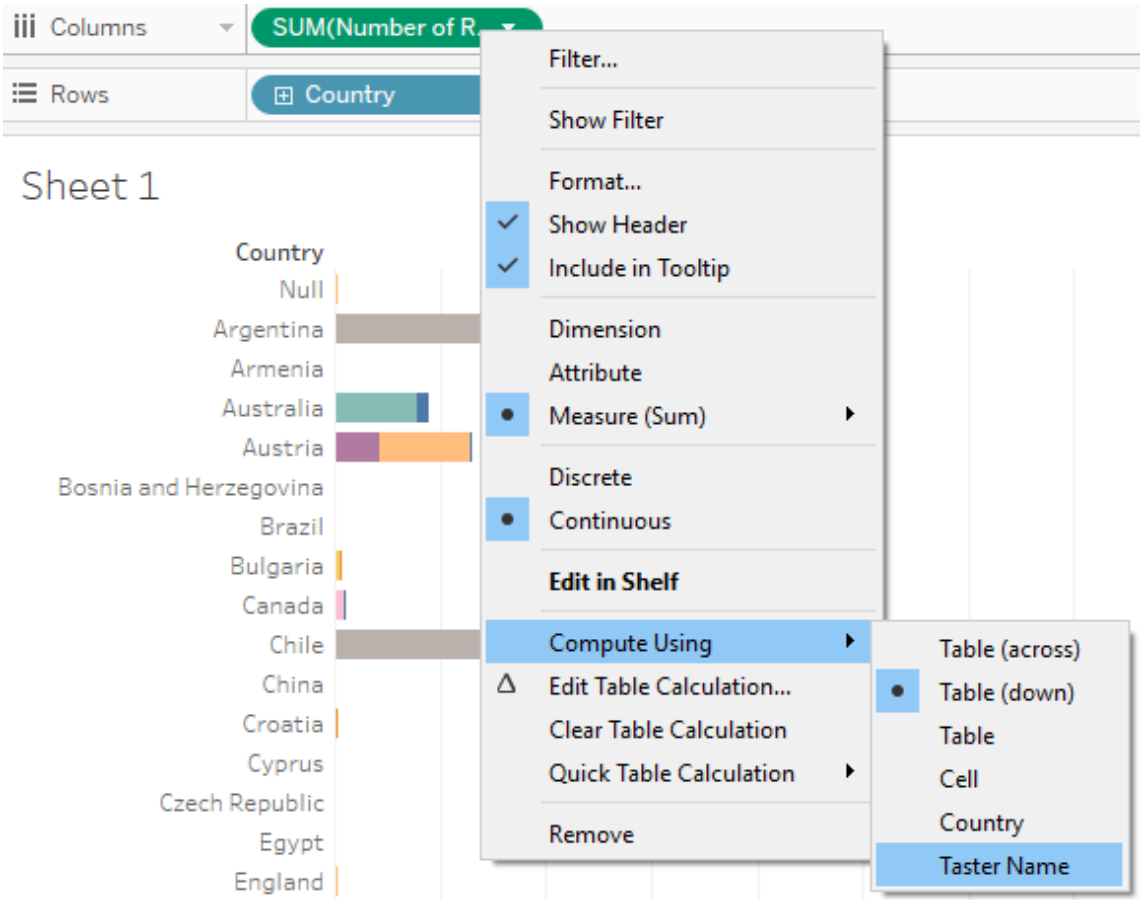
Connect to the `Winery.csv` dataset, and open a new blank worksheet.

How to do it...

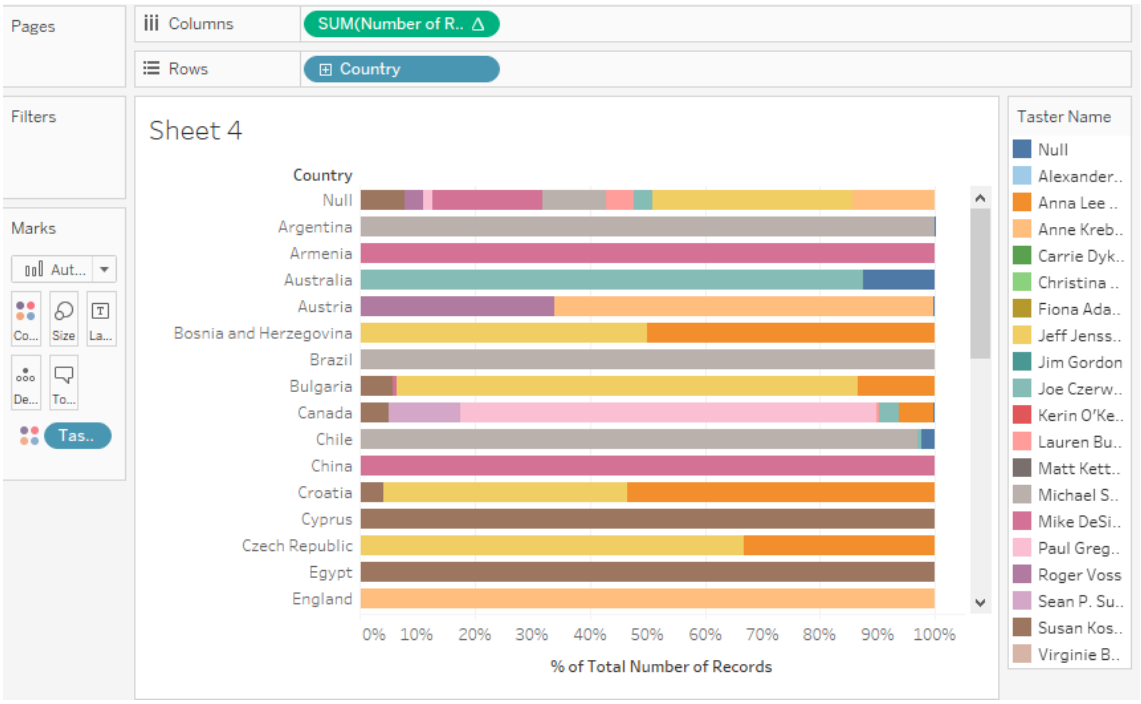
1. Drag and drop **`Country`** from **`Dimensions`** into the **`Rows`** shelf.
2. Drag and drop **`Number of Records`** from **`Measures`** into the **`Columns`** shelf.
3. Drag and drop **`Taster Name`** from **`Dimensions`** onto **`Color`** in the **`Marks`** card.
4. Right-click on the **`Number of Records`** pill in the **`Columns`** shelf and in the drop-down menu navigate to **`Quick Table Calculation | ``Percent of Total`**:



5. Once again, right-click on the **`Number of Records`** pill in the ** `Columns` **shelf and in the drop-down menu navigate to **`Compute Using`** | **`Taster Name`**:

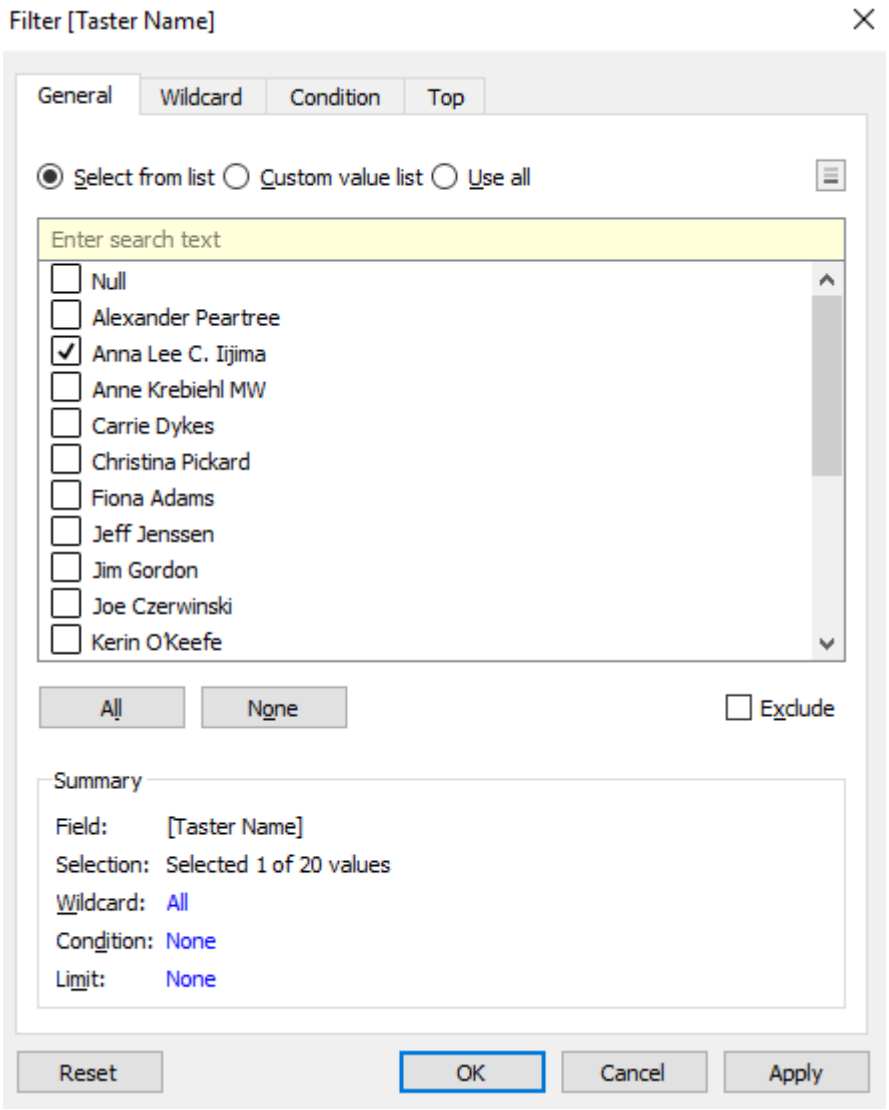


6. We can now see the percentage of reviews done by each of the tasters in each of the countries. However, the view looks pretty messy, and it's difficult to identify individual wine tasters, as shown in the following screenshot:

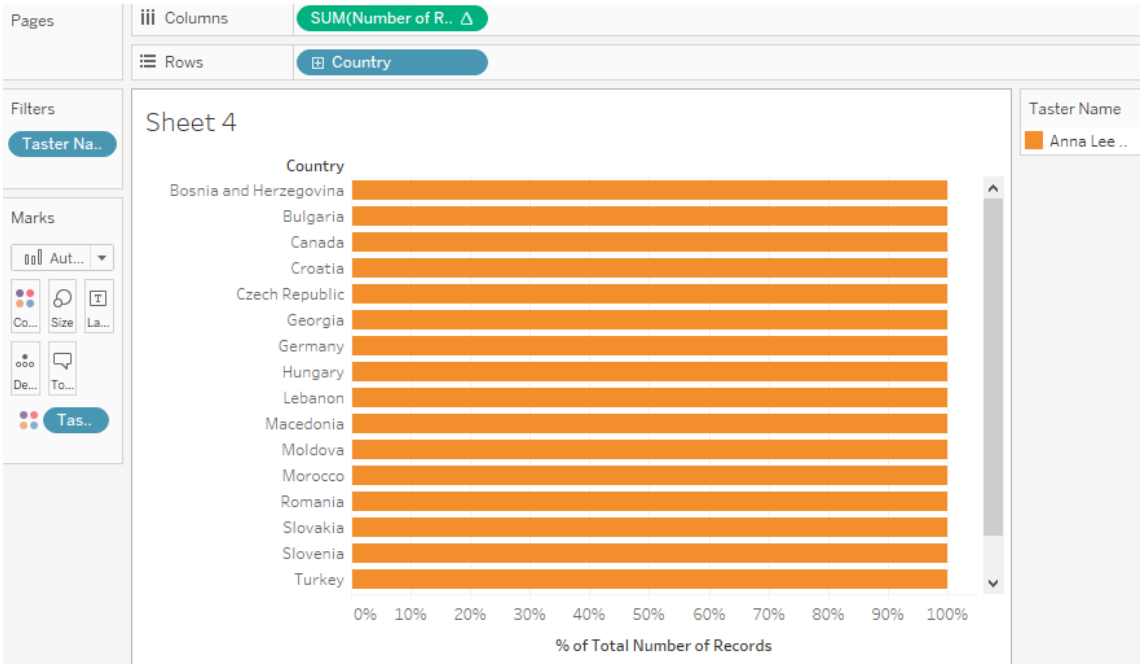


7. Let's say we want to filter out a single taster, and see their share of reviews in each country. Drag and drop **`Taster Name`** from **`Dimensions`** into the **`Filters`** shelf.
8. In the **`Filter [Taster Name]`** window, click on **`None`** to deselect all names. Then, select

> ***`Anna Lee C. Iijima`***
>
> ```
> and click **`OK`**:
> ```



The view we got is not what we needed! See the following screenshot:

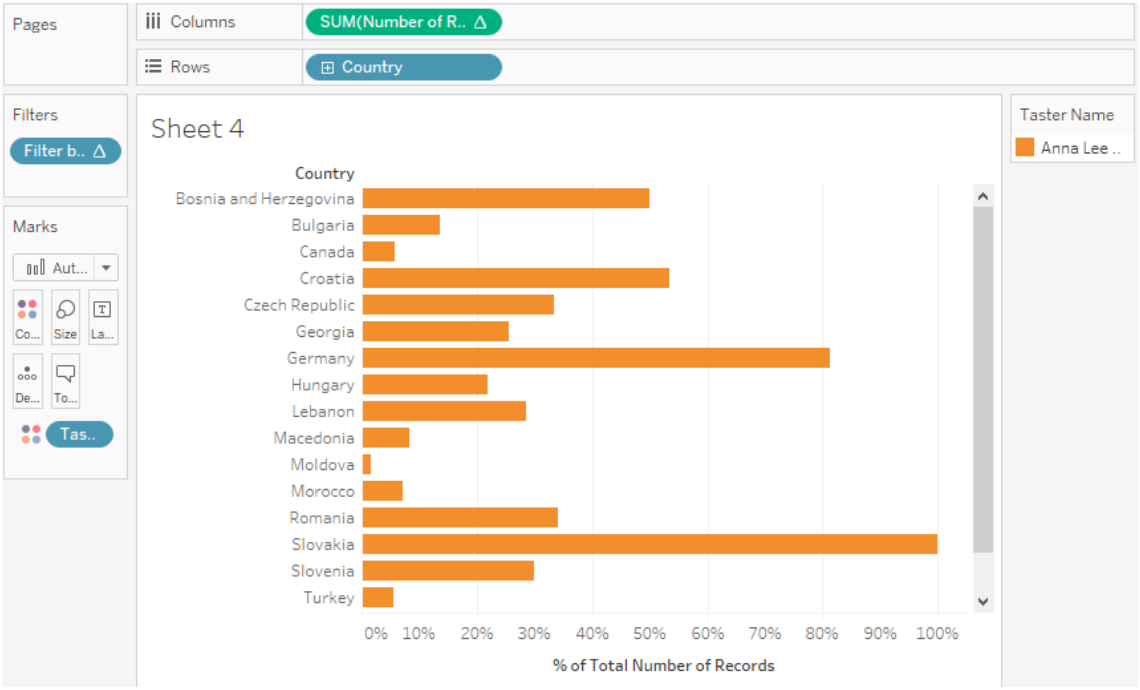


9. Let's correct that. In the main menu toolbar, click on **`Analysis`** and select **`Create Calculated Field`**... .
10. In the calculated field editor window, rename the calculated field from **`Calculation1`** to `Filter by Wine Taster`.
11. In the formula space, write the following expression:

```
LOOKUP(ATTR([Taster Name]),0)
```

The preceding expression is shown in the following screenshot:

12. Click **`OK`** to exit the window.
13. Remove **`Taster Name`** from the **`Filter`** shelf and drag and drop the new calculated field, **`Filter by Wine Taster`**, into the **`Filter`** shelf instead.
14. In the **`Filter [Filter by Wine Taster]`** window, select **`Anna Lee C. Iijima`** and click **`OK`**.
    The view now shows the percentage of records by this wine taster in each country:



How it works...

Table calculations only take into account data that is in the view. We have created a table calculation to show the proportion of records by each wine taster. However, when we exclude all wine taster names but one, Tableau recalculates the table calculation using only data that is in the view, which means that all records in each country now belong to a single **Taster Name**.

This results in a completely uninformative view, which tells us that 100% of records belong to this particular taster.

By implementing the table calculation filter, we allow the original table calculation (that computes the percentages) to take place before the view is actually filtered, and not the other way around, which is the case when we just implement the filter by **Wine Taster**.

Because of this, our view is filtered after the table calculation is performed, and the table calculation is unaffected by some of the rows being filtered out of the view.

There's more...

We could achieve the same result by simply hiding all wine taster names except the one we want to see from the view. This can be a good, quick solution for creating a one-time, static view.

However, this is generally not recommended because it's not interactive (it's not that easy to switch between different values of the filters), and can also be confusing to someone who is looking at the view for the first time---they could not really tell what the view has been filtered by.

Implementing action filters

Action filters allow us to filter values across multiple worksheets in a simple, intuitive way---just by clicking on the data point in our view that we would like to filter by.

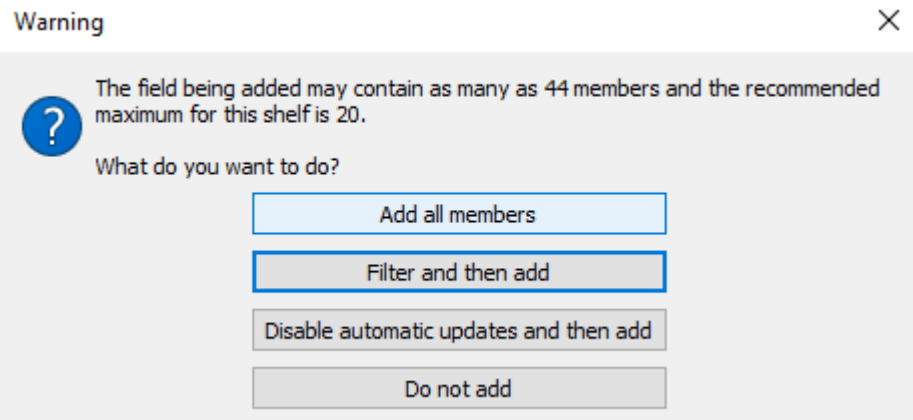
Getting ready

In this lab, we will be using the `Winery.csv` dataset. Make sure you are connected to it, and open a new blank worksheet.

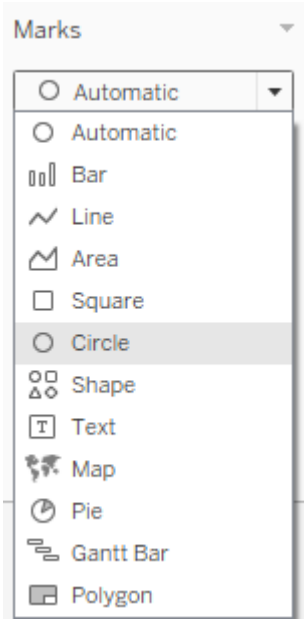
How to do it...

1. Drag and drop **Country** from **Dimension** onto **Detail** in the **Marks** card.
2. Drag and drop **Points** from **Measures** onto **Color** in the **Marks** card.
3. Right-click on the **SUM (Points)** pill in **Color**, navigate to **Measure (Sum)**, and from the drop-down menu, select **Average**.
4. Create a new blank worksheet by clicking on the New Worksheet tab at the bottom of the workspace. Alternatively, in the main menu toolbar, navigate to **Worksheet** | **New Worksheet** from the drop-down menu.

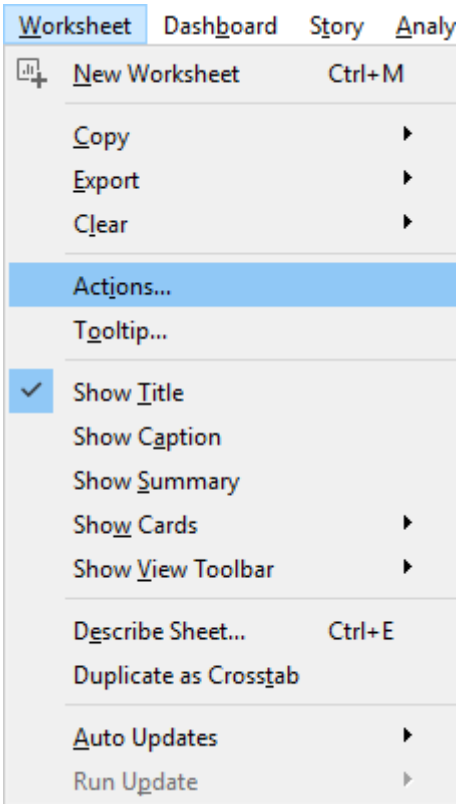
5. In the new worksheet, drag and drop **`Country`** from **`Dimensions`** onto **`Color`** in the **`Marks`** card. A dialog window may pop up, asking you if you would like to filter out some of the countries. Select **`Add all members`**:



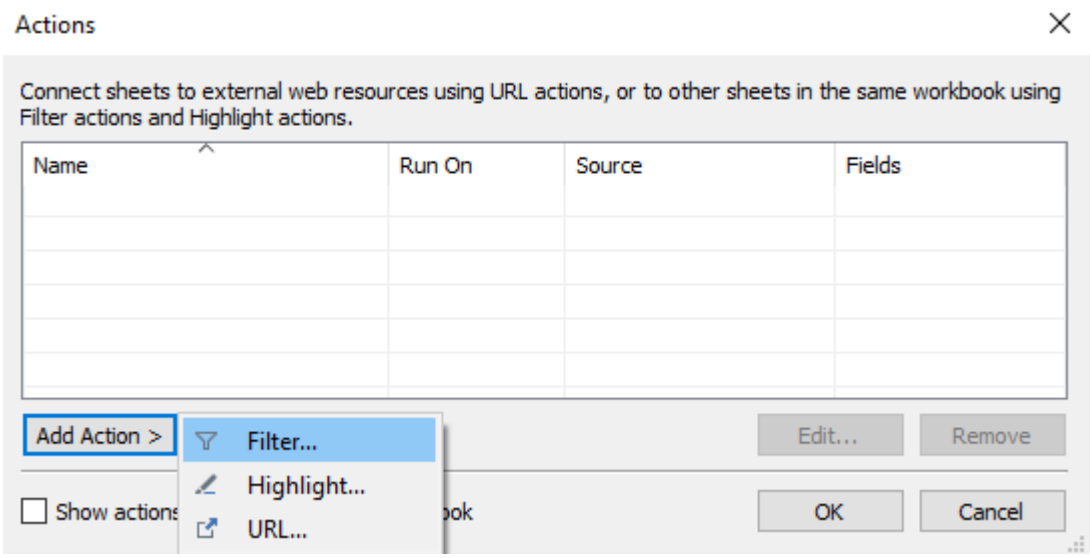
6. Drag and drop **`Province`** from **`Dimensions`** onto **`Detail`** in the **`Marks`** card.
7. Drag and drop **`Price`** from **`Measures`** **onto** **`Size`** in the **`Marks`** card.
8. Right-click on the **`SUM (Price)`** pill in **`Size`**, navigate to **`Measure (Sum)`**, and from the drop-down menu, select **`Average`**.
9. In the **`Marks`** card, click on the drop-down menu and change the mark type from **`Automatic`** to **`Circle`**:



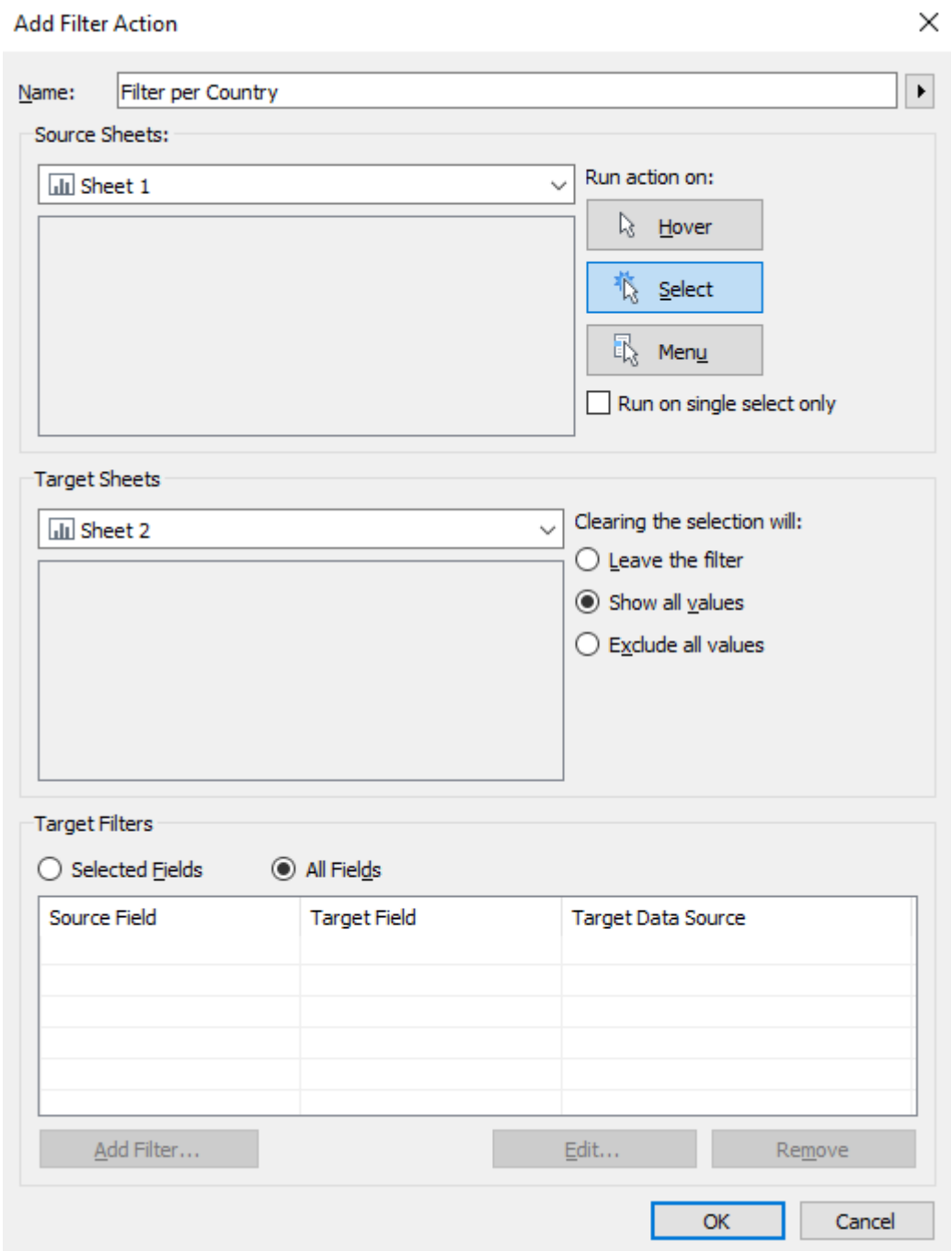
10. Navigate to **`Sheet 1`**. In the main menu toolbar, select ** `Worksheet` **and in the drop-down menu, navigate to **`Actions...`**:



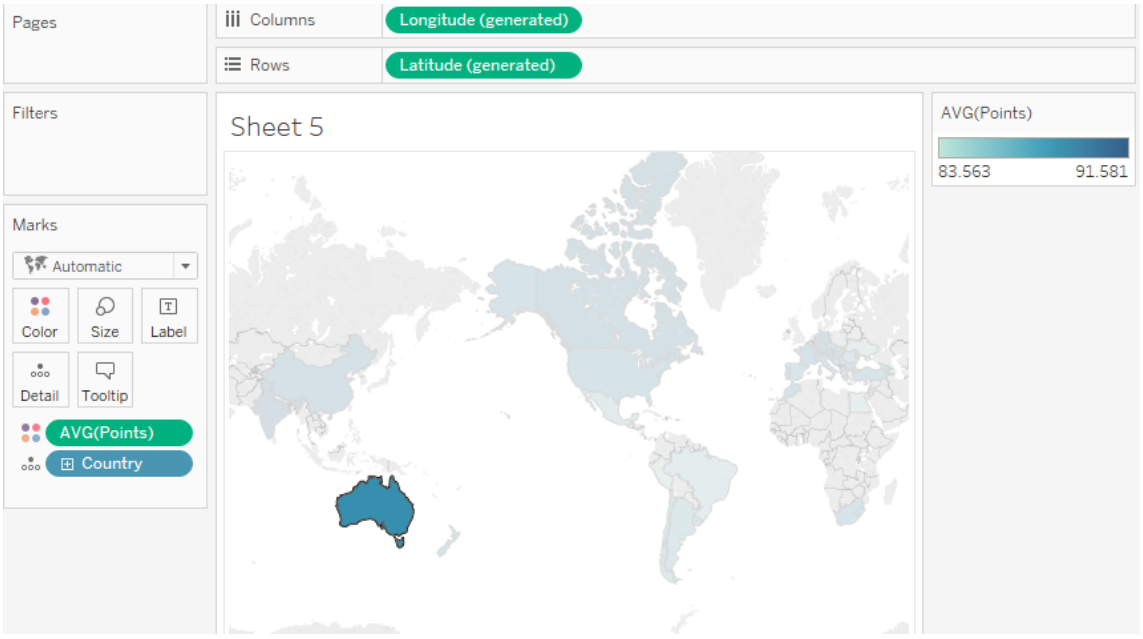
11. In the **`Actions`** window that opens, click on the **`Add Action >`** button and select **`Filter...`**:



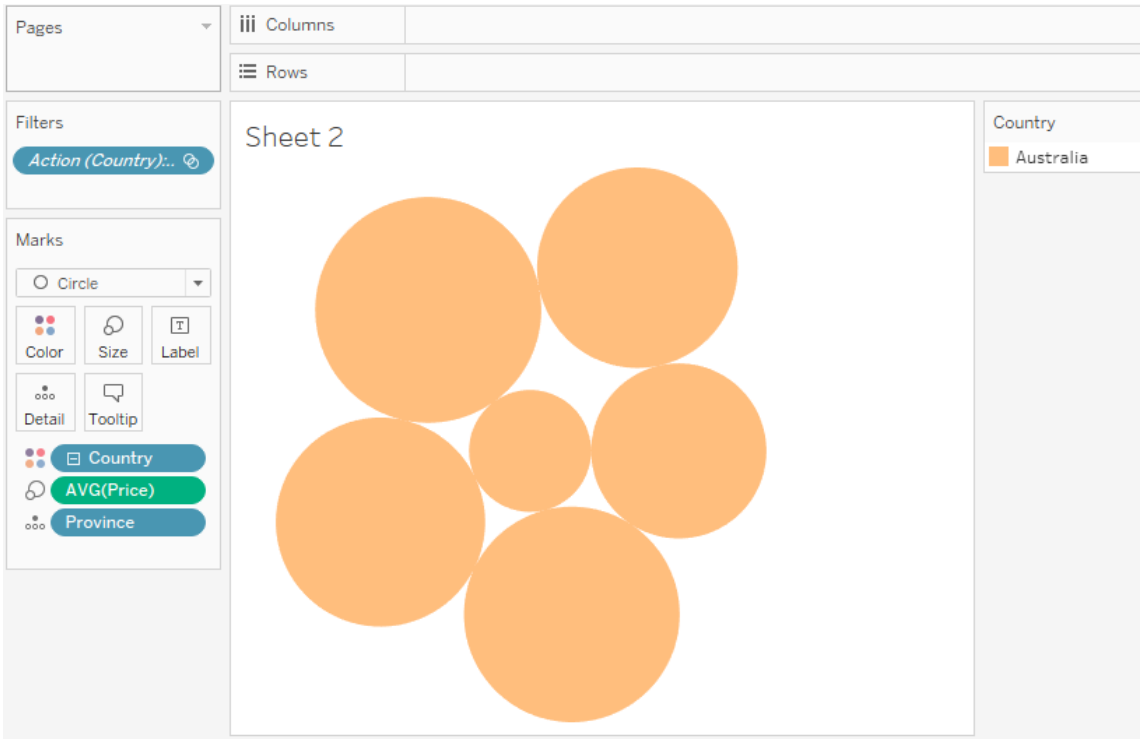
12. In the **`Add Filter Action`** window, use the **`Name`** field to change the name of the filter from **`Filter``1`** to `Filter per Country`.
13. Under ** `Run``action on,` **select **`Select`**.
14. Set **`Target Sheets`** to **`Sheet 2`**.
15. Click **`OK`** to exit the window:



16. You will notice that our filter, **`Filter per Country`**, has now appeared in the list in the **`Actions`** window. Click **`OK`** to exit the **`Actions`** window.
17. We have now set up the action filter. Click on any country in the map on ** `Sheet 1` **and observe the result on **`Sheet 2`**. Notice that the action filter has now also appeared in the **`Filters`** shelf. For example, if we click on Australia in **`Sheet 1`**, Australia will automatically be filtered in **`Sheet 2`**, as follows:



Let's look at the result in the following screenshot:



How it works...

In this lab, we have set up a filter action. Filter actions send information between worksheets. When we click on a mark in `Sheet``1`, it sends information to `Sheet 2`, and automatically sets the selected mark in `Sheet 1` as a

filter in `Sheet 2`.

Note that the view in `Sheet 1` is aggregated per `Country` and `Province`, while the view in `Sheet` 2 does not contain information on `Province`. Regardless of the different level of detail in the two views, Tableau filters out the common element, the selected `Country` from `Sheet 2`.

There's more...

When implementing action filters, Tableau offers various options.

Apart from setting the action on selection, as we have done this time, it is also possible to run the action on hover, or by using a menu.

Also, we can choose what happens once the selection is cleared. Upon clearing the selection, we can choose to leave the filter, show all values, or exclude all values.