Lab 7: Creating Powerful Calculations

In this lab, you'll find the following exercises to help you create calculated fields to create a more valuable dataset:

- Creating calculated fields
- Creating conditional calculations
- Extracting substrings
- Changing date formats with calculations
- Creating relative temporal calculations
- Creating regular expressions in calculations

Technical requirements

To follow along with the exercises in this lab, you will require **Tableau Prep Builder**.

The exercises in this lab use sample data files that you can download from the course GitHub repository: https://github.com/fenago/tableau-data-prep.

Creating calculated fields

In this exercise, we'll look at a quick method to help reveal the data actually in use in a **Tableau Desktop** visualization.

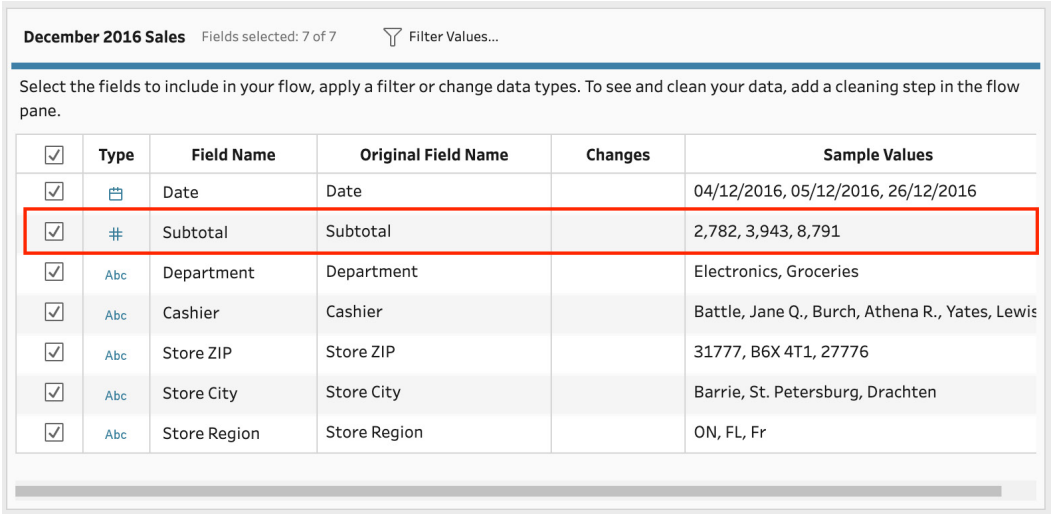
Getting ready

To follow along with this exercise, download the **Sample Files 7.1** folder from this course's GitHub repository. There, you'll find the **December 2016 Sales.xlsx** Excel file. In the version of the sales data we've been using throughout this course, you'll find that we have a single field with the subtotal, that is, the amount to be paid for the goods purchased, excluding any applicable taxes or charges. In this exercise, we'll use Tableau Prep to create calculated fields to display the sales tax amount and the total transaction amount, that is, the amount the customer will actually have to pay.

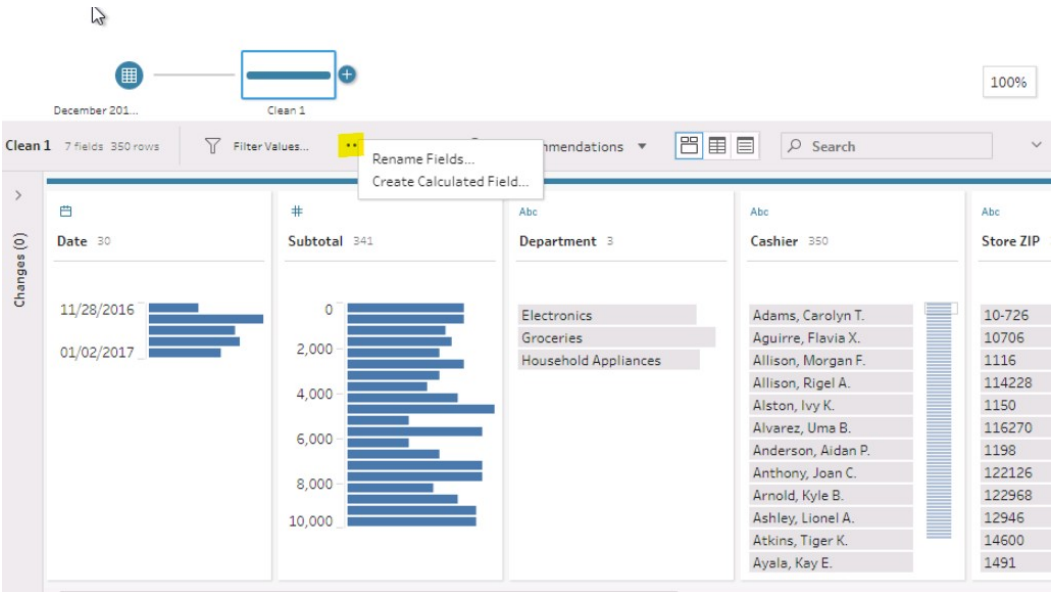
How to do it...

Start by opening the **December 2016 Sales.xlsx** flow from the **Sample Files 7.1** folder in **Tableau Prep**, then follow these steps:

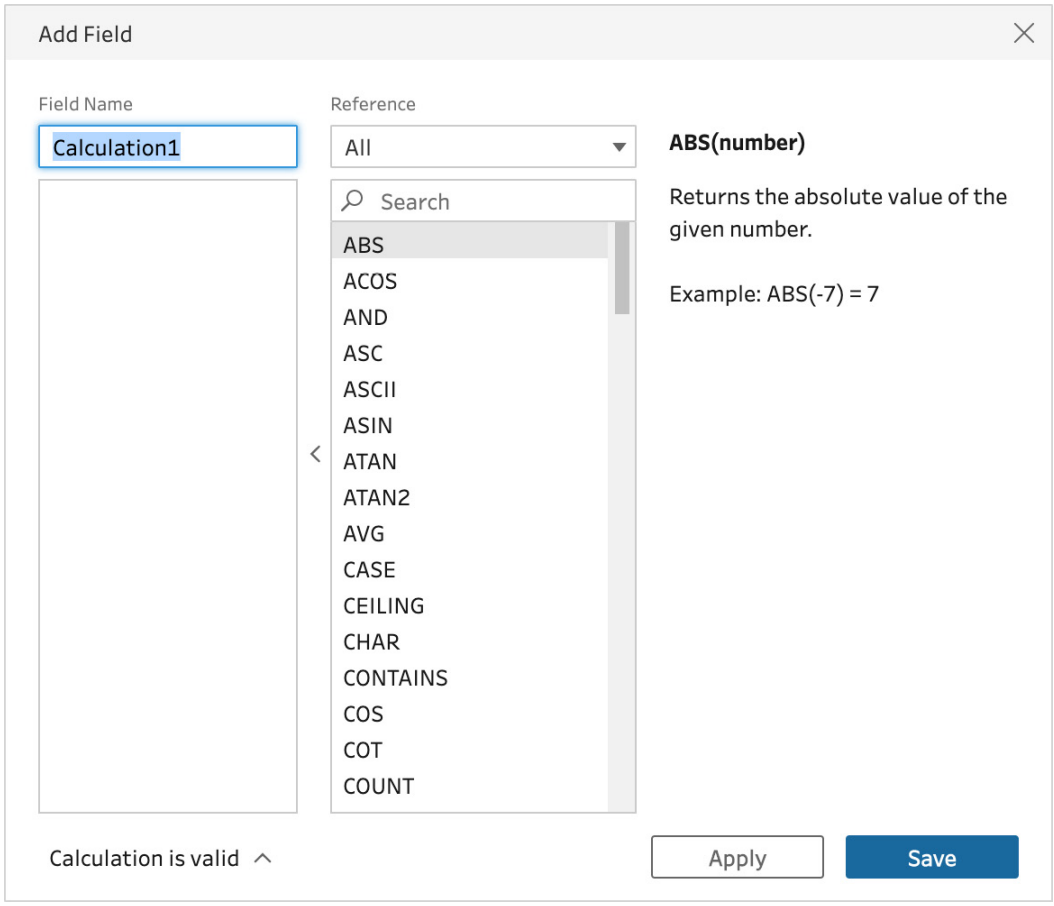
1. Examine your dataset and confirm that there is indeed only one numeric field, named **Subtotal**, as shown in the following screenshot:



2. Click the plus icon on your **December 2016 Sales** step and add a clean step. With the clean step selected, the **Create Calculated Field** button will appear in the bottom pane, as shown in the following screenshot:



3. Click the **Create Calculated Field** button to bring up the **Add Field** dialog. This is where we can create and edit calculated fields. At the top, we'll find the **Field Name** input box, as seen in the following screenshot, which is where we can give our calculated field a name. The text we input in the **Field Name** box is the name of the new column that will be added to our dataset. Below that, we find an empty input box. This input box is where we will type our calculations. Finally, below that is the validation status, which currently displays **Calculation is valid**. As we type our calculations, Tableau Prep will validate the calculation in real time and provide hints on any potential calculation issues as they occur:



Important note

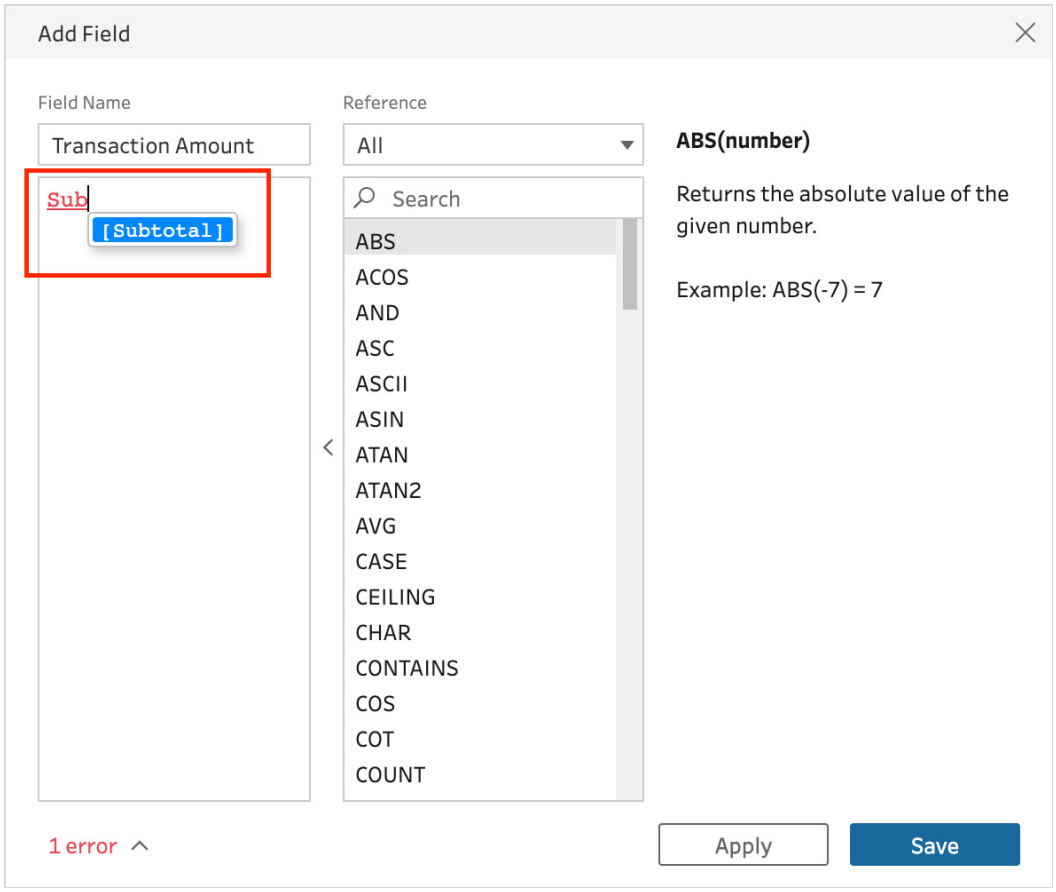
In the **Add Field** dialog, you can type your calculation from scratch or use the functions listed in the **Reference** list to the right to get started. When selecting an advanced function in the **Reference** list, you will see an explanation of that function to the right.

When you double-click an item in the **Reference** list, it will automatically add a template calculation to the input box to the right so that you can build calculations faster.

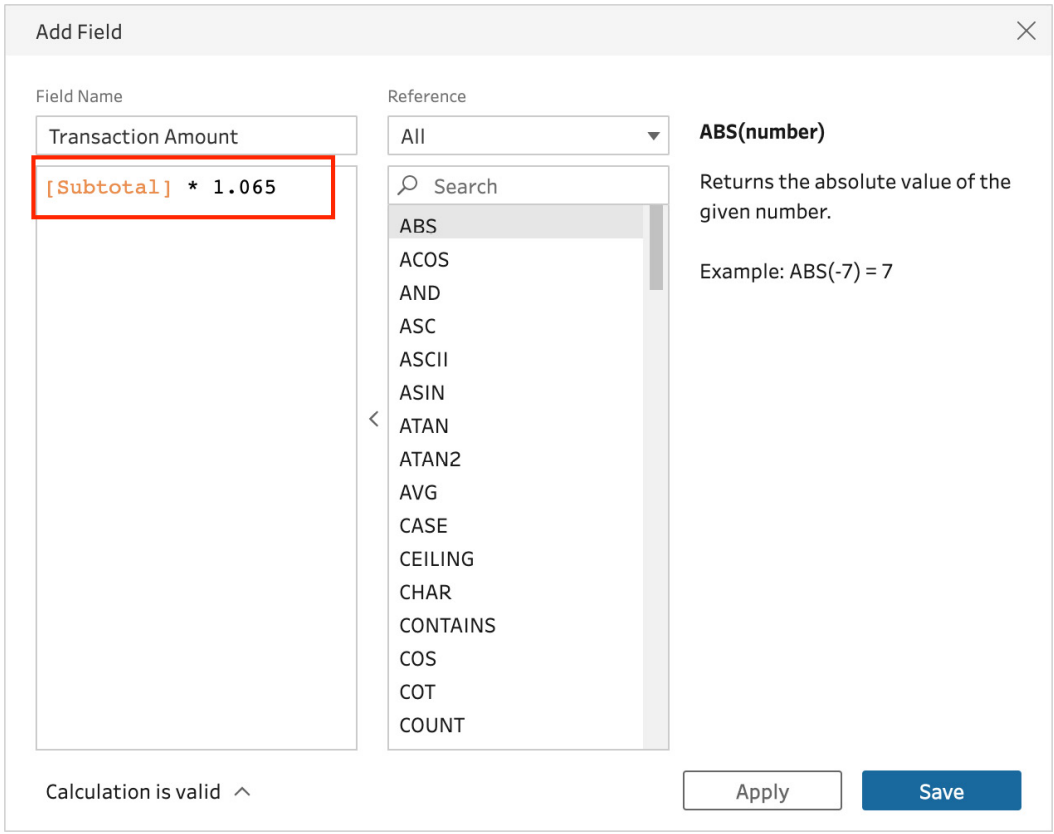
The **Reference** list does not include basic arithmetic operations, such as addition or subtraction. Nevertheless, you can use such operators in your calculations.

4. Let's create a calculated field that will state the total transaction amount the customer has to pay including sales taxes. In this example, let's assume a flat-rate sales tax that is applicable to all goods, set at 6.5%. In order to calculate the total transaction amount, we need to multiply the **Subtotal** field we identified in *Step 1* by **1.065**. Get started by setting the field name to **Transaction Amount**.

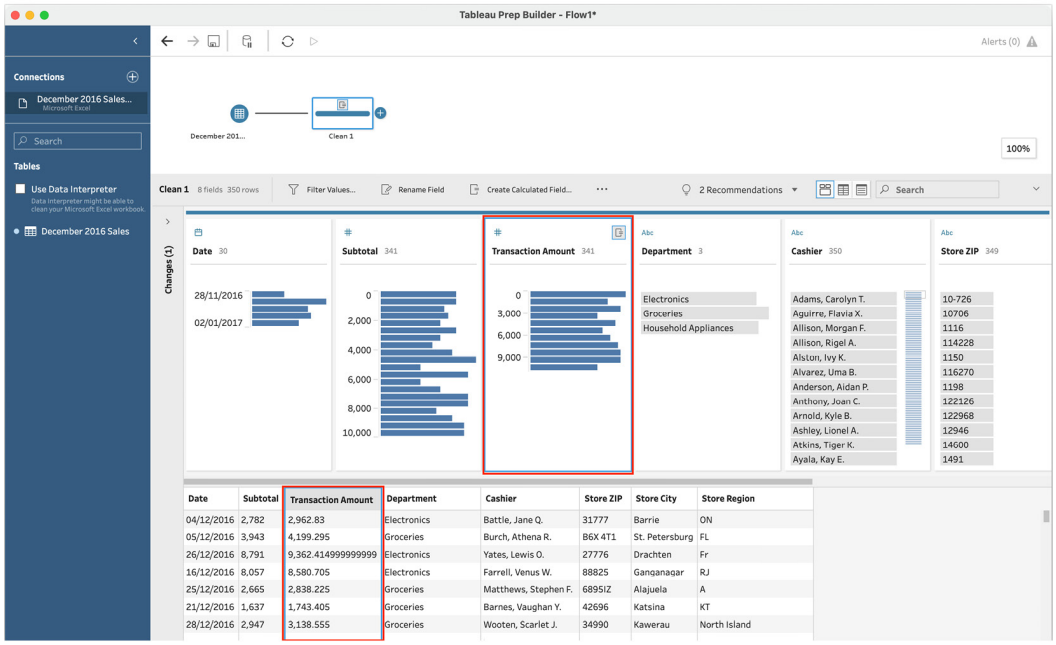
5. Next, in the calculation input box, type in **Sub**. Notice how Tableau Prep's autocomplete function suggests the **Subtotal** field. Click the suggestion to add it to your calculation:



6. In order to multiply **Subtotal** by 1.065, enter *** 1.065** in the calculated field input box and click **Save** to add your new calculated field:



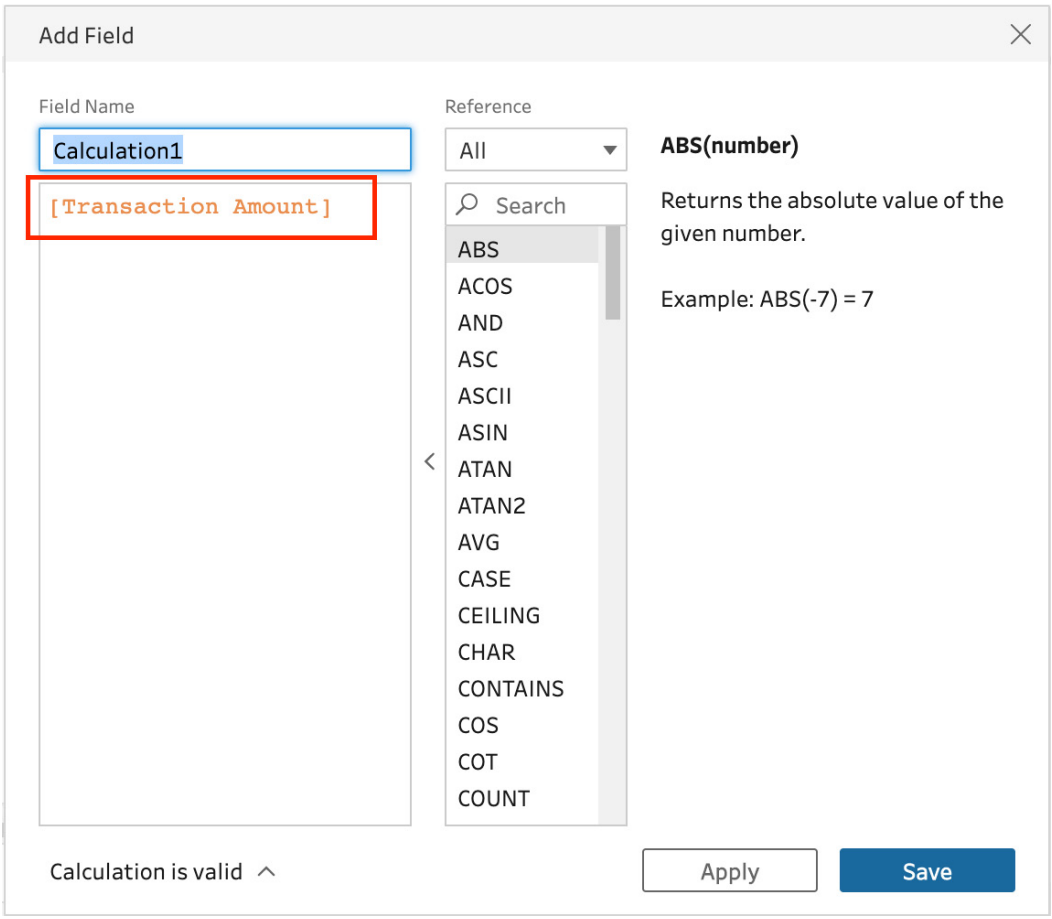
7. You'll instantly see your newly added **Transaction Amount** field in the field list and the data preview. Newly added calculated fields are added to the beginning. Drag the field so that it's positioned after the **Subtotal** field, as shown in the following screenshot:



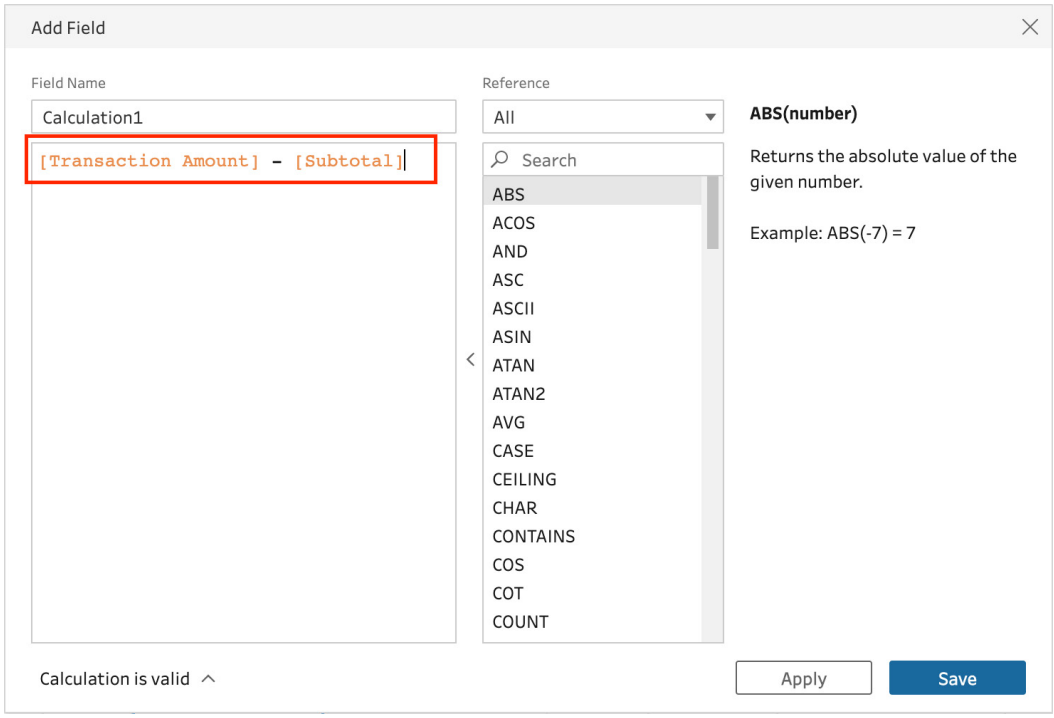
Important note

Although Tableau Prep indicated that the calculation is valid, it only checks for the arithmetic and logic, not whether your calculation outcome is the one you were aiming for. Because Tableau Prep has a handy data preview instantly available to you, I always like to pick up a calculator and calculate the outcome of two or three rows to ensure the outcome is as expected.

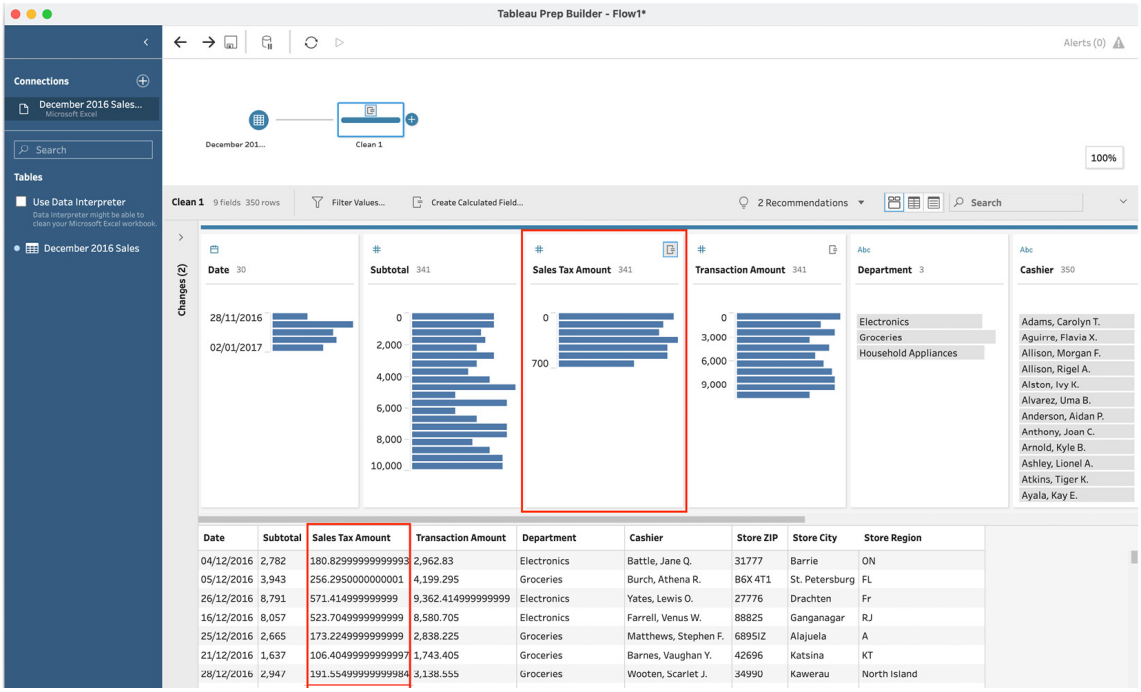
8. Let's practice adding another calculated field, this time to return the sales tax amount. We don't need to add another clean step in order to add another calculated field. You can create multiple calculated fields in a single clean step or across multiple clean steps. With the **Transaction Amount** field still selected, from dragging it to its new position in *Step 7*, click the **Create Calculated Field** button to bring up the **Add Field** dialog again. Notice how the calculation input box already has **[Transaction Amount]** pre-populated, as we can see in the following screenshot. That is the result of having the field selected when we clicked on **Create Calculated Field**:



9. In order to calculate the sales tax amount, we could create a calculation using only the **Subtotal** field included in the original source data. However, it is possible to use other calculated fields in a calculated field, meaning we can simply subtract **Subtotal** from our **Transaction Amount** calculated field in order to determine the amount of sales tax. To do this, update the calculation by adding **- [Subtotal]**, as shown in the following screenshot. You can either type in the entire calculation or leverage the autocomplete suggestions:



10. Name this field **Sales Tax Amount** and click **Save** to add it to your flow.
11. Re-arrange the newly added **Sales Tax Amount** field in your field list so that it is positioned after the **Subtotal** field:



With these steps completed, you've successfully enriched your dataset by adding the **Sales Tax Amount** and **Transaction Amount** calculated fields.

How it works...

In this exercise, we learned how to create calculated fields using basic arithmetic. We also learned that we could leverage existing calculated fields in a new calculation. We've seen that selecting a field prior to starting your calculation inserts that field into any new calculation. By typing in our calculation, we've seen Tableau Prep's autocomplete feature at work and you are now familiar with the functions section, which you can leverage anytime you need help finding or using a function. During this practice, we enriched our dataset and improved any downstream analysis processes that require the information we generated in the calculated fields. Preparing your data in this fashion can avoid many complications and speed up connected reports because they do not have to perform these calculations anymore. In general, applying calculated fields in your data preparation phase, rather than during the subsequent reporting phase, promotes data consistency for your organization.

Creating conditional calculations

One of the most powerful calculations you can do is **conditional calculations**. Conditional calculations return a value based on the criteria you set in the calculation itself. When the conditions are met, a certain value is returned, as specified by you in the calculation. Because conditional statements are relatively resource-intensive on your computer's hardware, it is best to perform them during data preparation in **Tableau Prep** rather than a downstream analysis tool. By performing resource-intensive tasks in Tableau Prep, the data output will already contain the end result, preventing your analysis tools, such as **Tableau Desktop**, from having to perform these tasks at a less convenient time. In this exercise, we'll calculate the sales tax amount as well. However, this time, we're going to apply a different tax rate based on the department. To do so, we're going to use a conditional calculation.

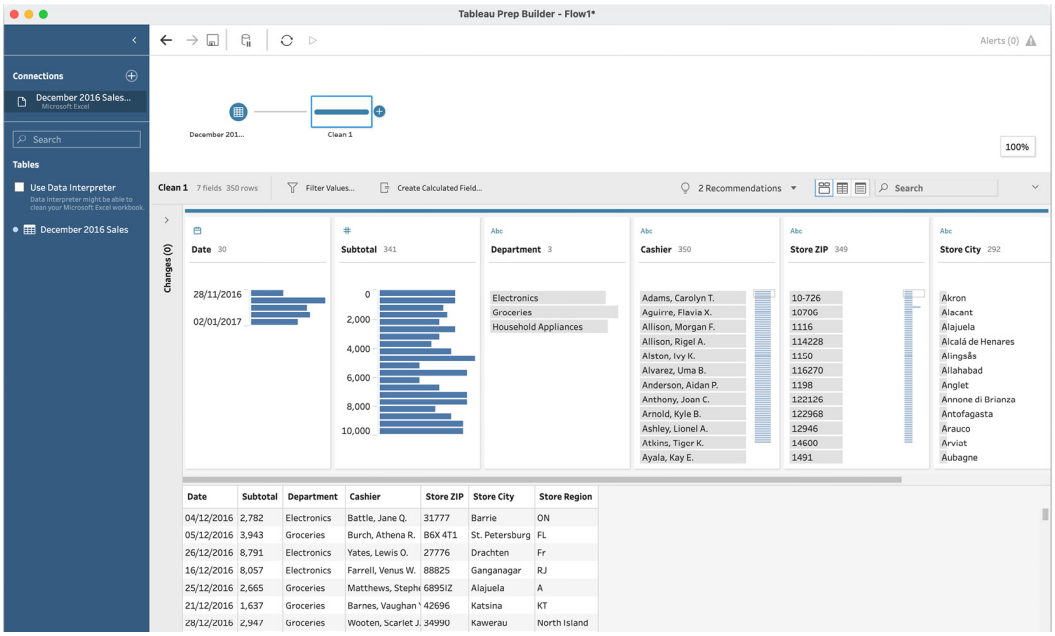
Getting ready

To follow along with this exercise, download the **Sample Files 7.2** folder from this course's GitHub repository. There, you'll find the **December 2016 Sales.xlsx** Excel file we've used previously. The data contains sales data, including the subtotal amount due, excluding applicable taxes. In the previous exercise, we used a calculated field to determine the sales tax amount and total transaction amount by assuming a flat sales tax percentage set at 6.5%.

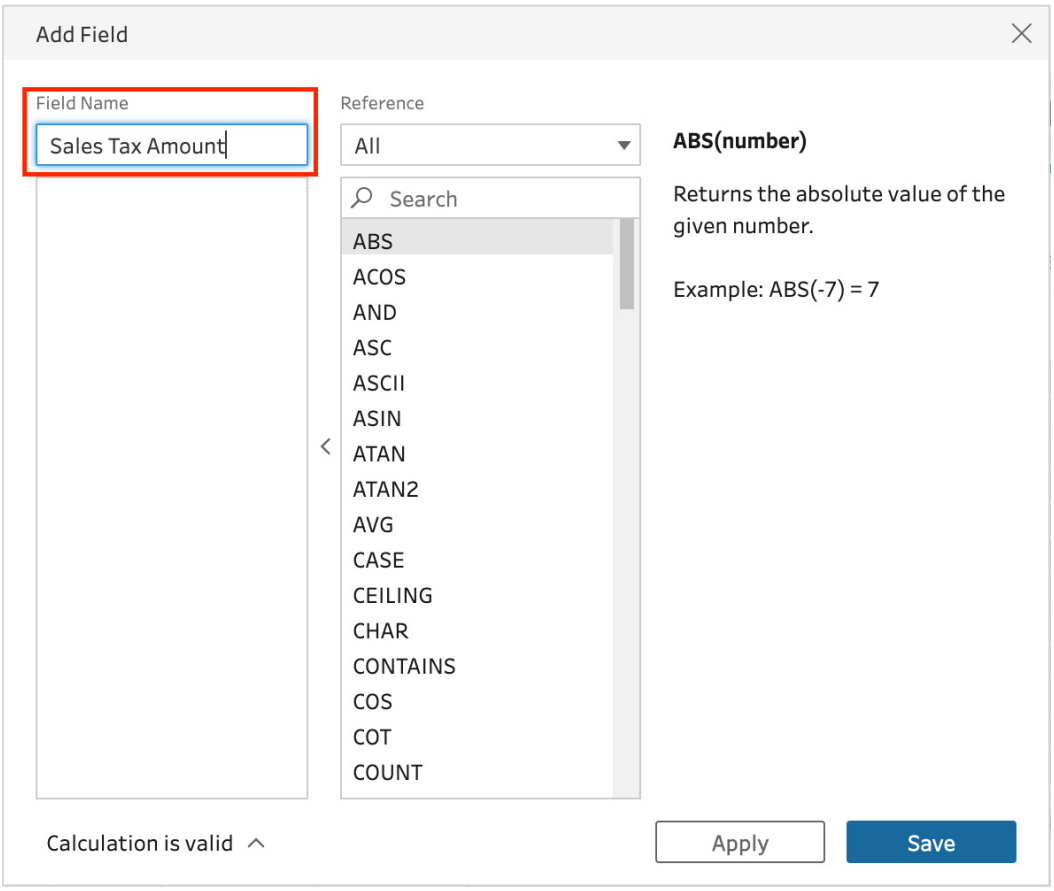
How to do it...

Start by opening the **December 2016 Sales.xlsx** flow from the **Sample Files 7.2** folder in **Tableau Prep**, then follow these steps:

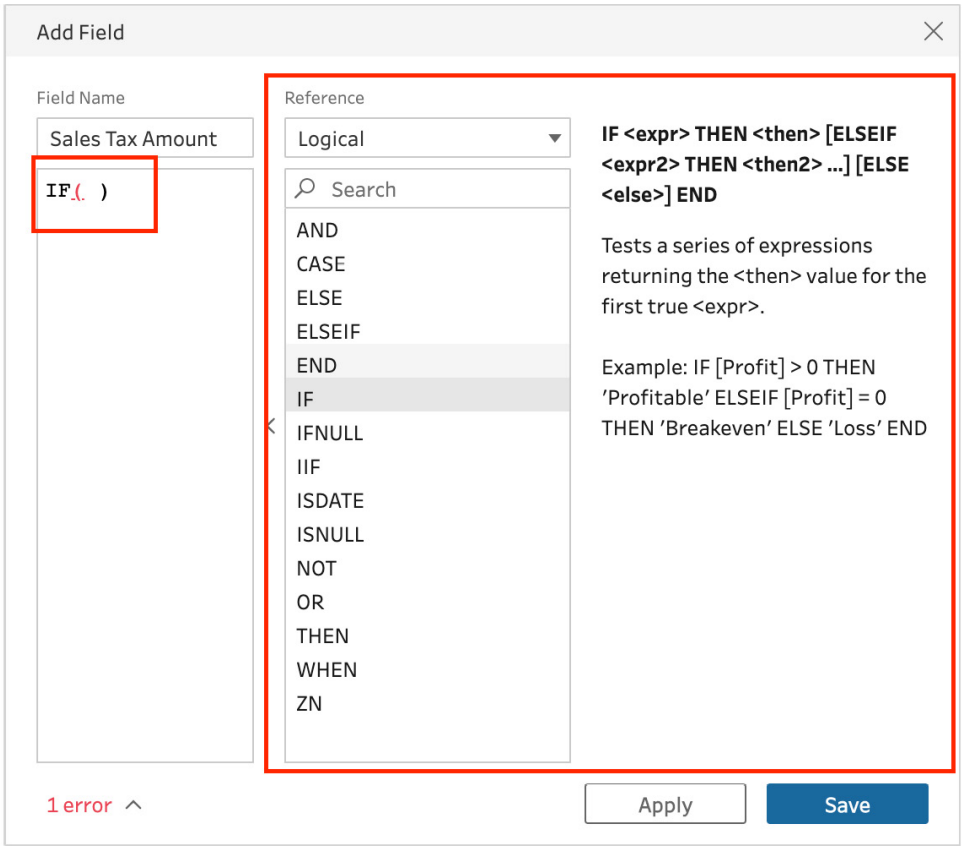
1. Add the **December 2016 Sales** sheet to your flow and connect a clean step, as shown in the following screenshot. Take note that our data includes the **Subtotal** amount, but not the sales tax amount or total transaction amount. Also note that the **Department** field contains three unique values. They are **Electronics**, **Groceries**, and **Household Appliances**:



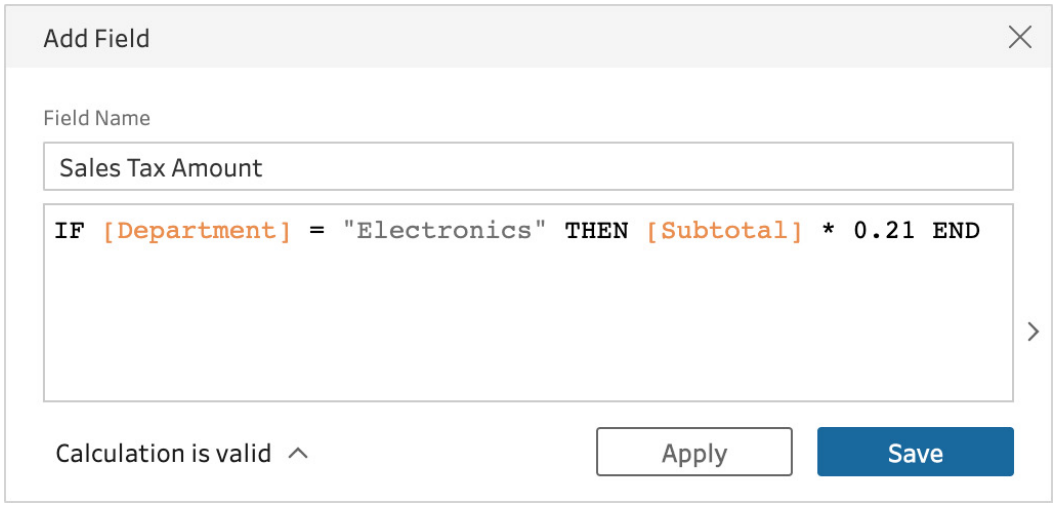
2. Click on **Create Calculated Field** to bring up the **Add Field** dialog. Name the new calculation **Sales Tax Amount**:



3. Conditional calculations use logical functions. Filter the **Reference** list to **Logical** to see the available functions, then select **IF**. When you select a function, Tableau Prep will give you a brief outline of the functionality, as well as an example. Double-click **IF** so that it is added to your calculation input box, as shown in the following screenshot:



4. Let's write out our calculation and assume a tax rate of 21% for **Electronics**, 5% for **Groceries**, and 10% for **Household Appliances**. We'll start off with just **Electronics**. Remove the parentheses in the calculation and complete the calculation so that it reads **IF [Department] = "Electronics" THEN [Subtotal] * 0.21 END**. This calculation checks each row in your data and if **Department** is equal to **Electronics**, it will multiply the **Subtotal** amount by **0.21**, or 21% (if you require additional screen space, you can collapse the **Reference** list by selecting the arrow in the middle of the screen):

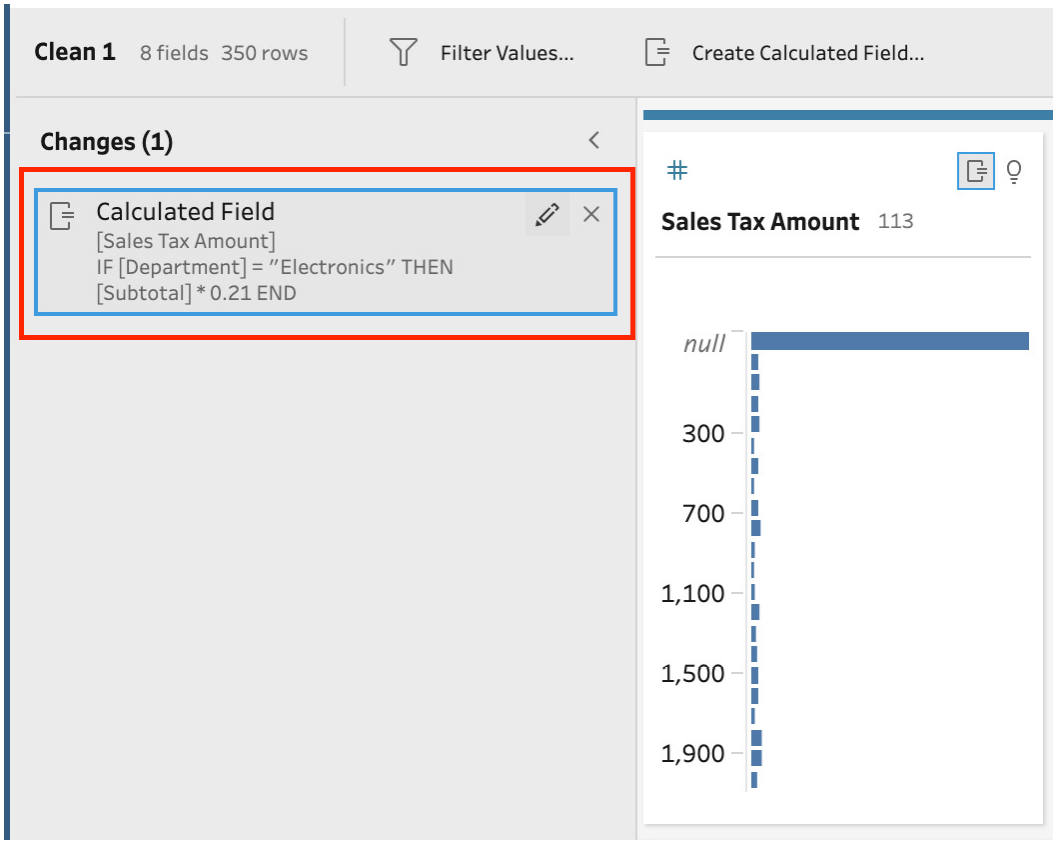


5. You can see from the **Calculation is valid** text in the bottom-right corner of the calculation editor that this calculation is ready to be saved. Although it is incomplete for our purposes, the **END** keyword in our calculation indicates to Tableau Prep that this is the end of our **IF** expression. Save the calculation and observe the data preview values for the newly added **Sales Tax Amount** field:

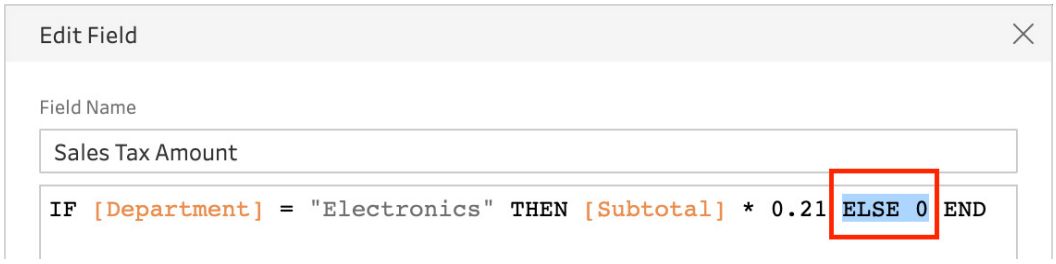
Sales Tax Amount	Date	Subtotal	Department	Cashier	Store ZIP	Store City	Store Region
584.22	04/12/2016	2,782	Electronics	Battle, Jane Q.	31777	Barrie	ON
null	05/12/2016	3,943	Groceries	Burch, Athena R.	B6X 4T1	St. Petersburg	FL
1,846.11	26/12/2016	8,791	Electronics	Yates, Lewis O.	27776	Drachten	Fr
1,691.97	16/12/2016	8,057	Electronics	Farrell, Venus W.	88825	Ganganagar	RJ
null	25/12/2016	2,665	Groceries	Matthews, Stephen F.	6895IZ	Alajuela	A
null	21/12/2016	1,637	Groceries	Barnes, Vaughan Y.	42696	Katsina	KT
null	28/12/2016	2,947	Groceries	Wooten, Scarlet J.	34990	Kawerau	North Island
null	06/12/2016	6,522	Household Appliances	Merrill, Suki G.	37127	Hamburg	Hamburg
null	01/12/2016	1,665	Groceries	Anthony, Joan C.	71899	Istanbul	Istanbul
null	08/12/2016	5,945	Household Appliances	Harmon, Remedios D.	16153	Merchtem	Vlaams-Brabant
null	17/12/2016	3,757	Household Appliances	Mccoy, Fritz L.	42570	LaSalle	Ontario
717.99	18/12/2016	3,419	Electronics	Landry, Yael Z.	95578	Aubagne	PR
308.28	03/12/2016	1,468	Electronics	Bush, Jennifer L.	N4R 8T3	Cumberland	ON

In our updated dataset, as shown in the previous screenshot, we can see that each row with a **Department** value of **Electronics** has the **Sales Tax Amount** field populated. However, all other rows, that is, those with **Groceries** or **Household Appliances**, have a **null** value for **Sales Tax Amount**. This exercise illustrates what happens when we do not provide what is known as a **catch-all**. A catch-all will allow us to set a value for any scenarios we have not anticipated, or at least not specified.

6. Let's add a catch-all to our **Sales Tax Amount** calculated field. Expand the **Changes** pane and select the edit button for our calculated field to return to the calculation editor:



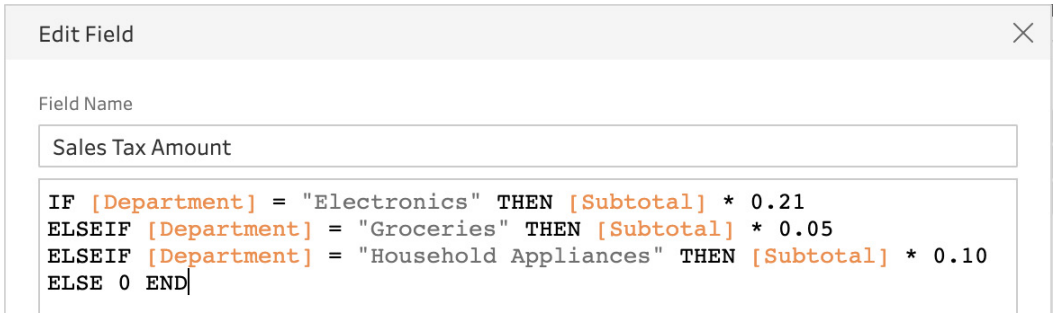
7. Update the calculation by inserting **ELSE 0** before **END**. This will tell Tableau Prep that if none of the conditions you specified are met, it should return a zero:



8. Save the updated calculated field and observe the result in the data preview. All rows with **Groceries** or **Household Appliances** now have a **Sales Tax Amount** value set at zero:

Sales Tax Amount	Date	Subtotal	Department	Cashier	Store ZIP	Store City	Store Region
584.22	04/12/2016	2,782	Electronics	Battle, Jane Q.	31777	Barrie	ON
0	05/12/2016	3,943	Groceries	Burch, Athena R.	B6X 4T1	St. Petersburg	FL
1,846.11	26/12/2016	8,791	Electronics	Yates, Lewis O.	27776	Drachten	Fr
1,691.97	16/12/2016	8,057	Electronics	Farrell, Venus W.	88825	Ganganagar	RJ
0	25/12/2016	2,665	Groceries	Matthews, Stephen F.	6895IZ	Alajuela	A
0	21/12/2016	1,637	Groceries	Barnes, Vaughan Y.	42696	Katsina	KT
0	28/12/2016	2,947	Groceries	Wooten, Scarlet J.	34990	Kawerau	North Island
0	06/12/2016	6,522	Household Appliances	Merrill, Suki G.	37127	Hamburg	Hamburg
0	01/12/2016	1,665	Groceries	Anthony, Joan C.	71899	Istanbul	Istanbul
0	08/12/2016	5,945	Household Appliances	Harmon, Remedios D.	16153	Merchtem	Vlaams-Brabant
0	17/12/2016	3,757	Household Appliances	Mccoy, Fritz L.	42570	LaSalle	Ontario
717.99	18/12/2016	3,419	Electronics	Landry, Yael Z.	95578	Aubagne	PR
308.28	03/12/2016	1,468	Electronics	Bush, Jennifer L.	N4R 8T3	Cumberland	ON

9. Head back to the calculation editor and this time, we're going to add in logic for the **Groceries** and **Household Appliances** departments. To do this, we'll use the **ELSEIF** statement after the current condition; that is, if **Department** is not **Electronics**, then check whether it is **Groceries** and apply the relevant tax rate, and if it's not **Groceries**, check whether it is **Household Appliances** and apply the relevant tax rate. And, of course, if it is none of these, proceed to the catch-all, zero. Update the calculation by adding the following code after **0.21** to evaluate the department and apply the right tax rate: **ELSEIF [Department] = "Groceries" THEN [Subtotal] * 0.05 ELSEIF [Department] = "Household Appliances" THEN [Subtotal] * 0.10**. You can move code onto new lines to make your calculation more legible. Save your calculation when ready:



Important note

The calculation here can be written in different ways. We included some duplicative code here, namely **[Subtotal] ***. This is causing the calculation to become lengthier but easier to read. You may apply a different calculation, such as the following, to achieve the same output:

```
[Subtotal]*

IF [Department] = "Electronics" THEN 0.21

ELSEIF [Department] = "Groceries" THEN 0.05

ELSEIF [Department] = "Household Appliances" THEN 0.10

ELSE 0 END
```

10. In the data preview, confirm that each **Department** type now has a calculated **Sales Tax Amount** value:

Sales Tax Amount	Date	Subtotal	Department	Cashier	Store ZIP	Store City	Store Region
584.22	04/12/2016	2,782	Electronics	Battle, Jane Q.	31777	Barrie	ON
197.15	05/12/2016	3,943	Groceries	Burch, Athena R.	B6X 4T1	St. Petersburg	FL
1,846.11	26/12/2016	8,791	Electronics	Yates, Lewis O.	27776	Drachten	Fr
1,691.97	16/12/2016	8,057	Electronics	Farrell, Venus W.	88825	Ganganagar	RJ
133.25	25/12/2016	2,665	Groceries	Matthews, Stephen F.	6895IZ	Alajuela	A
81.85	21/12/2016	1,637	Groceries	Barnes, Vaughan Y.	42696	Katsina	KT
147.35	28/12/2016	2,947	Groceries	Wooten, Scarlet J.	34990	Kawerau	North Island
652.2	06/12/2016	6,522	Household Appliances	Merrill, Suki G.	37127	Hamburg	Hamburg
83.25	01/12/2016	1,665	Groceries	Anthony, Joan C.	71899	Istanbul	Istanbul
594.5	08/12/2016	5,945	Household Appliances	Harmon, Remedios D.	16153	Merchtem	Vlaams-Brabant
375.70000000000005	17/12/2016	3,757	Household Appliances	Mccoy, Fritz L.	42570	LaSalle	Ontario
717.99	18/12/2016	3,419	Electronics	Landry, Yael Z.	95578	Aubagne	PR
308.28	03/12/2016	1,468	Electronics	Bush, Jennifer L.	N4R 8T3	Cumberland	ON

With these steps completed, you've successfully added a conditional calculation and determined the **sales tax amount** based on the **department**.

How it works...

In this exercise, we learned how to apply conditional calculations using Tableau Prep's logical functions. We learned that we could use conditions to perform a given calculation. Conditions are one of the most powerful calculation functions you can employ in order to prepare your data and account for various scenarios, as we've done with the **Department** field in this exercise. By using calculated fields, we were able to determine a new value, **Sales Tax Amount**, based on the value of another field, **Department**. Conditional calculations are evaluated row by row and may be resource-intensive, which will be noticeable when working with relatively large datasets and running your flow. Nonetheless, applying these powerful calculations during data preparation will benefit downstream analysis since the output of Tableau Prep will already include the calculated value.

Extracting substrings

More often than not, data is delivered to us in a less-than-ideal state, with multiple values being held in a single field. We saw how to split data into multiple fields in the *Splitting columns with multiple values* exercise, in *Lab 3*, *Cleaning Transformations*. However, splitting fields relies on the data being organized, and will never leave out any of the data. In this exercise, we'll look at extracting substrings, which will result in new fields as well. However, unlike splitting fields, we'll be able to more narrowly define what data we want to include in our new field. Furthermore, extracting substrings is non-destructive, that is, the original field will remain unaffected. In this exercise, we'll load a dataset into Tableau Prep that has a field with multiple values in it. We'll then proceed to extract each value and create separate fields for each.

Getting ready

To follow along with this exercise, download the **Sample Files 7.3** folder from this course's GitHub repository. There, you'll find the **December 2016 Sales.xlsx** Excel file. In the version of the sales data we've been using throughout this course, you'll find that we have a field called **Customer Name**. The **Customer Name** field holds multiple values: the name of the customer, organized by last name, first name, middle name, and initial.

How to do it...

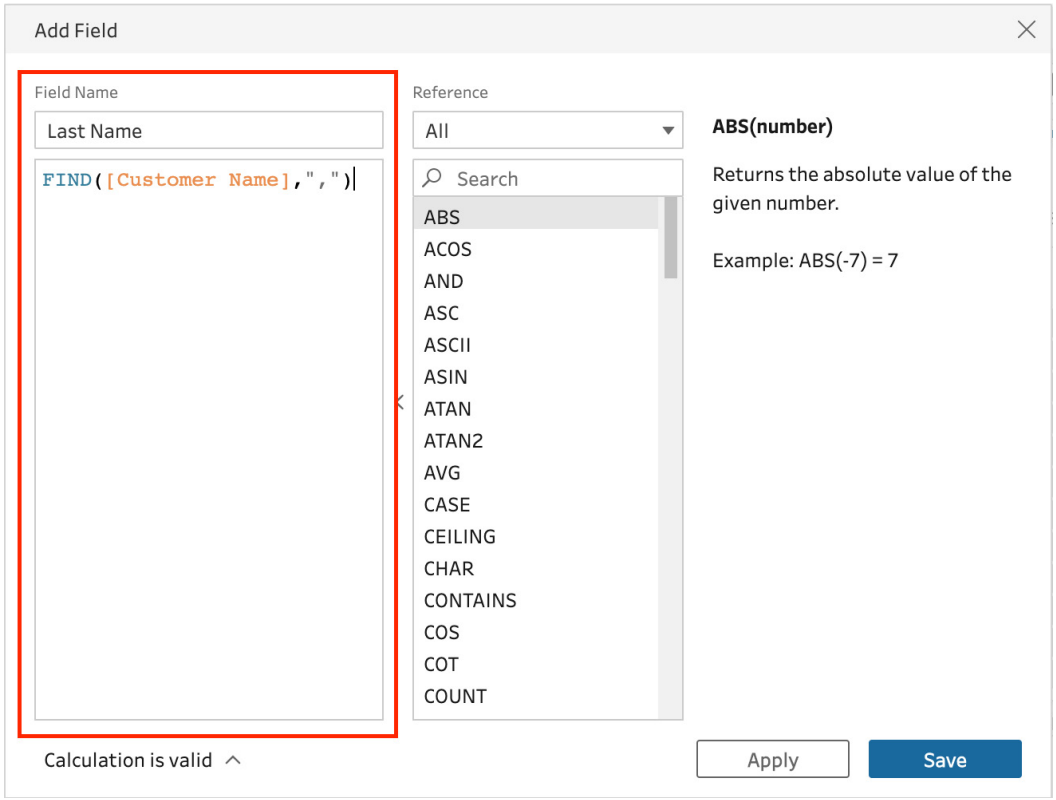
Start by opening the **December 2016 Sales.xlsx** flow from the **Sample Files 7.3** folder in **Tableau Prep**, then follow these steps:

1. Add a clean step to your flow and examine your data in the data preview grid. Observe the **Customer Name** field to confirm its contents are organized by last name, first name, middle name, and initial:

Date	Transaction Amount	Department	Customer Name	Store ZIP	Store City	Store Region
04/12/2016	2,782	Electronics	Battle, Jane Q.	31777	Barrie	ON
05/12/2016	3,943	Groceries	Burch, Athena R.	B6X 4T1	St. Petersburg	FL
26/12/2016	8,791	Electronics	Yates, Lewis O.	27776	Drachten	Fr
16/12/2016	8,057	Electronics	Farrell, Venus W.	88825	Ganganagar	RJ
25/12/2016	2,665	Groceries	Matthews, Stephen F.	6895IZ	Alajuela	A
21/12/2016	1,637	Groceries	Barnes, Vaughan Y.	42696	Katsina	KT
28/12/2016	2,947	Groceries	Wooten, Scarlet J.	34990	Kawerau	North Island

2. Let's first extract the last name substring. Click on **Create Calculated Field** and name your new calculation **Last Name**.

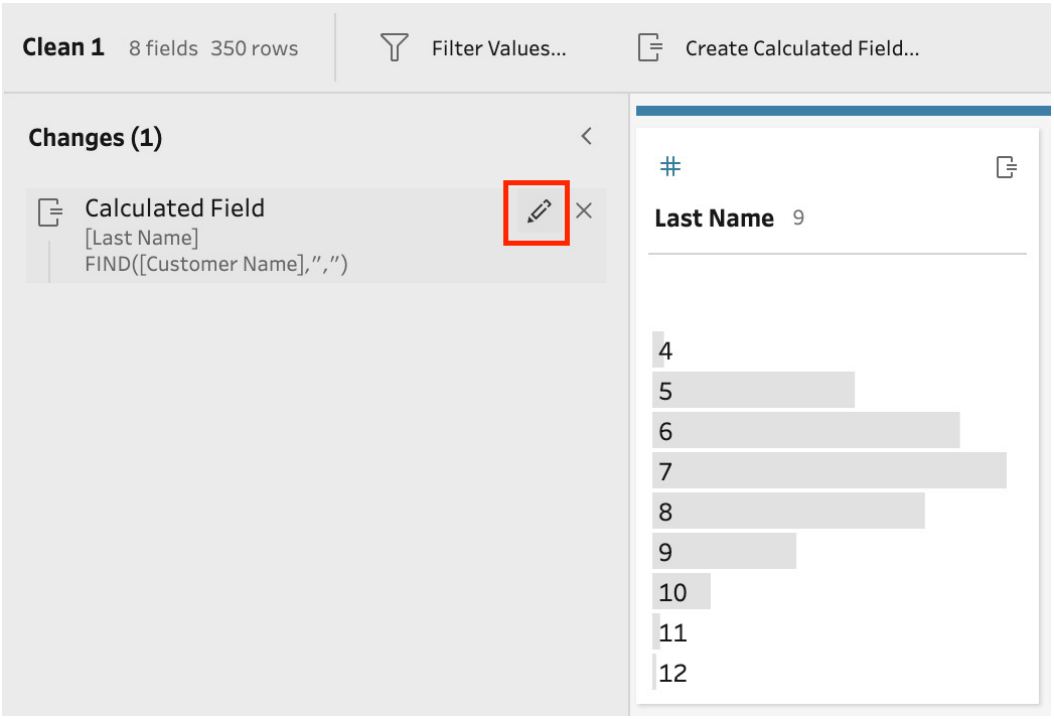
3. Since the last name is always followed by a comma, we are going to locate the position of the comma first. To do this, enter the **FIND([Customer Name],",")** calculation. The **FIND** function will evaluate a given field, **Customer Name** in this case, and locate a given substring, a *comma* character in our use case. When the **FIND** function locates the *comma* substring, it will return its position number:



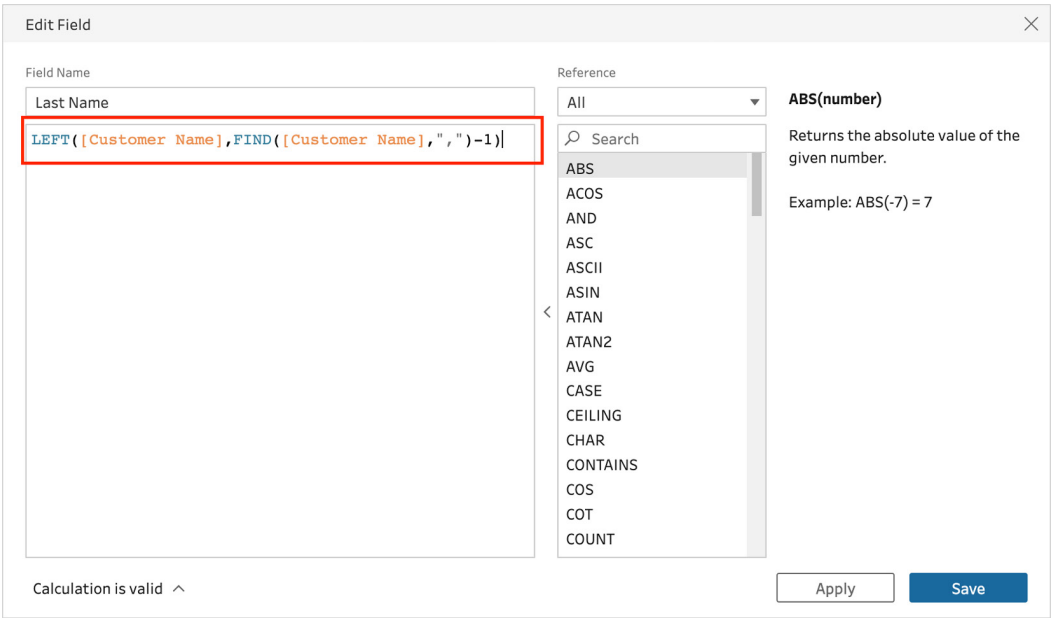
4. Click **Save** to add your new calculated field to the dataset and observe the results. The number indicates the position of the comma character in the **Customer Name** field. For example, the name **Yates, Lewis O.** has a comma character located at position 6. The first five characters make up the name **Yates**, and the sixth character is the comma:

Last Name	Date	Transaction Amount	Department	Customer Name	Store ZIP	Store City	Store Region
7	04/12/2016	2,782	Electronics	Battle, Jane Q.	31777	Barrie	ON
6	05/12/2016	3,943	Groceries	Burch, Athena R.	B6X 4T1	St. Petersburg	FL
6	26/12/2016	8,791	Electronics	Yates, Lewis O.	27776	Drachten	Fr
8	16/12/2016	8,057	Electronics	Farrell, Venus W.	88825	Ganganagar	RJ
9	25/12/2016	2,665	Groceries	Matthews, Stephen F.	6895IZ	Alajuela	A
7	21/12/2016	1,637	Groceries	Barnes, Vaughan Y.	42696	Katsina	KT
7	28/12/2016	2,947	Groceries	Wooten, Scarlet J.	34990	Kawerau	North Island

5. We need to amend our calculation in order to return the last name in full. To amend an existing calculation, expand the **Changes** pane, then click on the edit icon for our calculated field, as highlighted in the following screenshot:



6. We want to get all the starting characters of the string, up to the comma character position, excluding the comma. To do this, we can use the **LEFT** function. **LEFT** will return a specified number of characters from a given string. Update your calculation to **LEFT([Customer Name],FIND([Customer Name],",")-1)**. Here, we're instructing the **LEFT** function to get a substring from the **Customer Name** field, specifically the first number of characters as defined by the **FIND** function we wrote in *Step 3*. Notice how we added **-1** to the **FIND** function, in order to exclude the comma character itself:



7. Verify, in the data preview, that we're now returning the full last name:

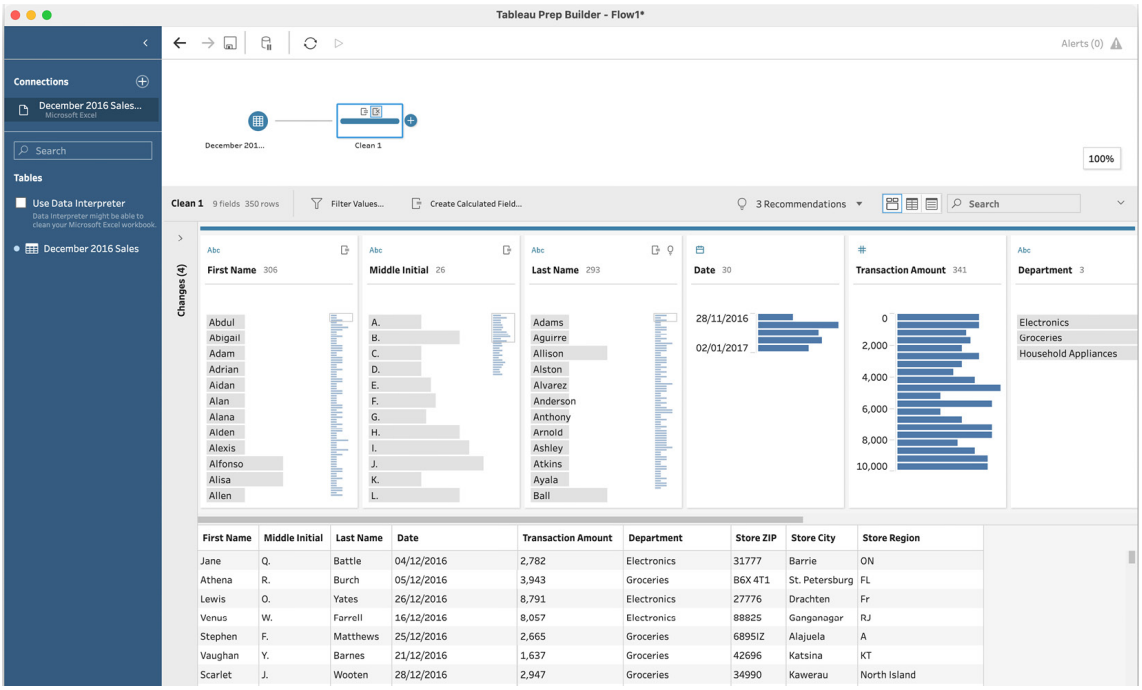
Last Name	Date	Transaction Amount	Department	Customer Name	Store ZIP	Store City	Store Region
Battle	04/12/2016	2,782	Electronics	Battle, Jane Q.	31777	Barrie	ON
Burch	05/12/2016	3,943	Groceries	Burch, Athena R.	B6X 4T1	St. Petersburg	FL
Yates	26/12/2016	8,791	Electronics	Yates, Lewis O.	27776	Drachten	Fr
Farrell	16/12/2016	8,057	Electronics	Farrell, Venus W.	88825	Ganganagar	RJ
Matthews	25/12/2016	2,665	Groceries	Matthews, Stephen F.	6895IZ	Alajuela	A
Barnes	21/12/2016	1,637	Groceries	Barnes, Vaughan Y.	42696	Katsina	KT
Wooten	28/12/2016	2,947	Groceries	Wooten, Scarlet J.	34990	Kawerau	North Island

8. Next, we are going to return the first name. Click on **Create Calculated Field** and name your new field **First Name**. Enter the **SPLIT([Customer Name]," ",2)** calculation. In this calculation, we're using the **SPLIT** function to separate values in the **Customer Name** column by a given character. The character we've specified between the quotation marks is blank, so we're splitting by an empty space. In doing so, we get three parts in our **Customer Name** field, that is, **last name**, **first name**, and **middle initial**. Since we want the second part, we specify **2** in the **SPLIT** function. Click **Save** to add your new field.

9. Next, let's create our final field for the middle initial. Click **Create Calculated Field** and name it **Middle Initial**. Enter the **RIGHT([Customer Name],2)** calculation. This calculation uses the **RIGHT** function. **RIGHT** will return the number of specified, in this case, **2**, rightmost characters in the **Customer Name** field. Click **Save** to add your new field.

10. To organize your dataset, drag the **Middle Initial** field between the **First Name** and **Last Name** fields.

11. We do not need the **Customer Name** field anymore. We can safely remove it and the three derived calculations will continue to function. Go ahead and remove the **Customer Name** field from your flow:



With these steps completed, you've successfully transformed your dataset by extracting three different substrings from the original **Customer Name** field.

How it works...

In this exercise, we learned how to create calculated fields using various string functions: **LEFT**, **RIGHT**, **SPLIT**, and **FIND**. Using each of these functions, we extracted a specific part of a text string, using **LEFT** or **RIGHT** to get the beginning or ending characters, **SPLIT** to break up a field into separate values, and **FIND** to locate the position of a substring so that we may then extract it. These are powerful functions as they allow you to create dynamic data extraction from a field. For example, the comma character we located using the **FIND** function could be in a different position in every row or every time the dataset is refreshed. Using this function, Tableau Prep will always evaluate the field to locate the right position first.

Changing date formats with calculations

When you work with many different disparate systems, you're bound to run into a scenario where a date is formatted in such a way that it isn't recognized by Tableau Prep as a date. As a result, Tableau Prep will set the data type for such a field to a string. So, we don't lose any data, but we cannot perform any date functions on such a field. To resolve this, we can create a calculation to re-organize the date string so that the newly added field can be recognized as a date. In this exercise, we'll process a data file using Tableau Prep that holds a date field with values not recognized as a date by Tableau. During the process, we'll change the format of the field using a calculation so that Tableau will then correctly recognize the field as a date data type.

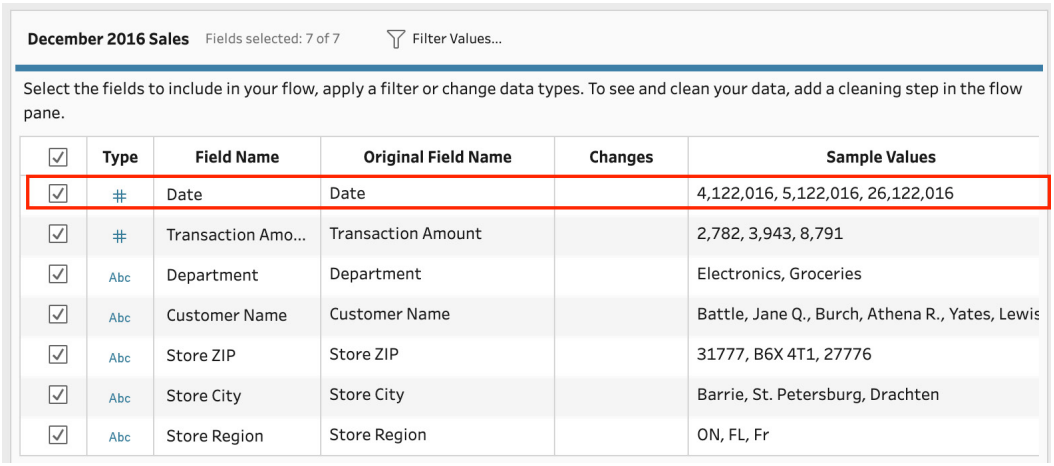
Getting ready

To follow along with this exercise, download the **Sample Files 7.4** folder from this course's GitHub repository. There, you'll find the **December 2016 Sales.csv** Excel file.

How to do it...

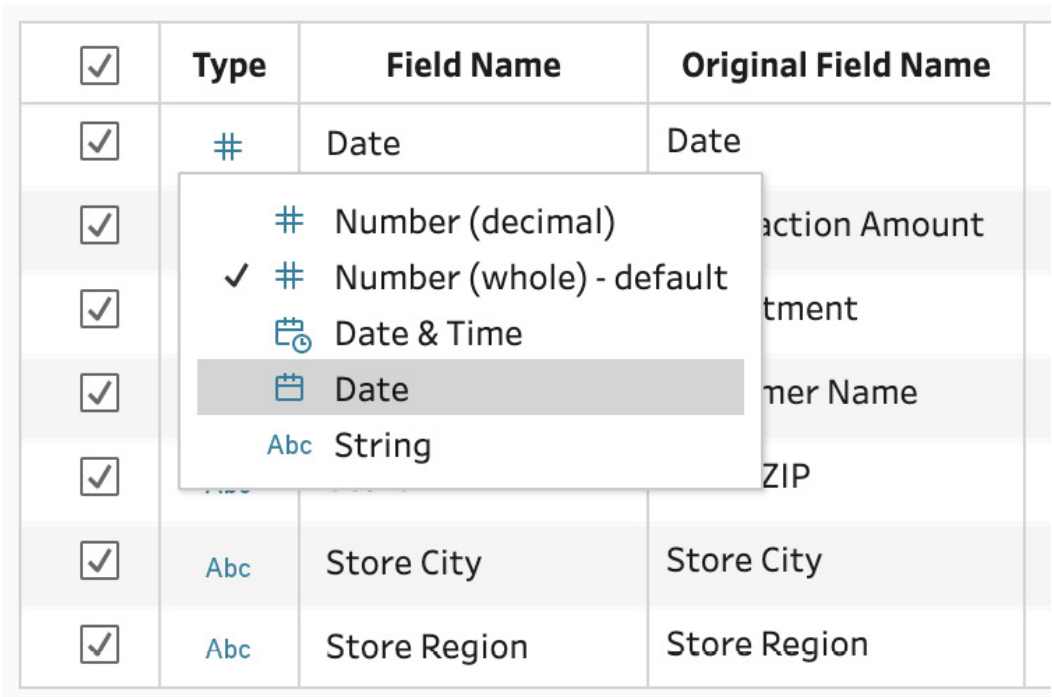
Start by connecting to the **December 2016 Sales.csv** file from the **Sample Files 7.4** folder in **Tableau Prep**, then follow these steps:

1. Before adding any additional tools, observe the **Date** field and its data type in the input step. Note that **Type** did not auto-detect a date and the sample values appear formatted as numbers:



	Type	Field Name	Original Field Name	Changes	Sample Values
☑	#	Date	Date		4,122,016, 5,122,016, 26,122,016
☑	#	Transaction Amo...	Transaction Amount		2,782, 3,943, 8,791
☑	Abc	Department	Department		Electronics, Groceries
☑	Abc	Customer Name	Customer Name		Battle, Jane Q., Burch, Athena R., Yates, Lewis
☑	Abc	Store ZIP	Store ZIP		31777, B6X 4T1, 27776
☑	Abc	Store City	Store City		Barrie, St. Petersburg, Drachten
☑	Abc	Store Region	Store Region		ON, FL, Fr

2. Click the **#** symbol in the **Type** column and set the data type to **String**:



Important note

You can change the data type of any field during an input step, or in any subsequent clean step. However, in this particular scenario, we'll want to change the data type during the input step. The reason for this is that Tableau Prep

has detected the field as a number, and if we pass data along to the next step with this setting, we'll lose the leading zero some dates have. For example, December 4, 2016 exists in our source file as **04122016**. Setting the format to string during the input step retains the leading zero and makes our subsequent calculations easier.

3. Add a clean step and determine the date format by reviewing the data in the preview pane. It seems our data is formatted as **DDMMYYYY**, that is, two digits to indicate the day, two digits to indicate the month, and four to indicate the year, without any separator symbols:

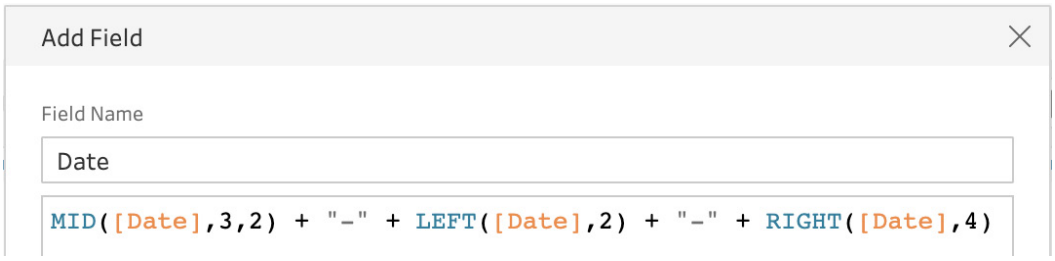
Date	Transaction Amount	Department	Customer Name	Store ZIP	Store City	Store Region
04122016	2,782	Electronics	Battle, Jane Q.	31777	Barrie	ON
05122016	3,943	Groceries	Burch, Athena R.	B6X 4T1	St. Petersburg	FL
26122016	8,791	Electronics	Yates, Lewis O.	27776	Drachten	Fr
16122016	8,057	Electronics	Farrell, Venus W.	88825	Ganganagar	RJ
25122016	2,665	Groceries	Matthews, Stephe	6895IZ	Alajuela	A
21122016	1,637	Groceries	Barnes, Vaughan Y	42696	Katsina	KT
28122016	2,947	Groceries	Wooten, Scarlet J.	34990	Kawerau	North Island

4. Click on **Create Calculated Field** and name your new field **Date**.

   Important note

   We already have a field name of **Date** in our dataset. When you name any new calculated field the same as an existing field in your dataset, Tableau Prep will automatically hide the original field and show the calculated field instead. This is a great feature to speed up your flow design as we do not have to manually remove the soon-to-be-redundant source **Date** field.

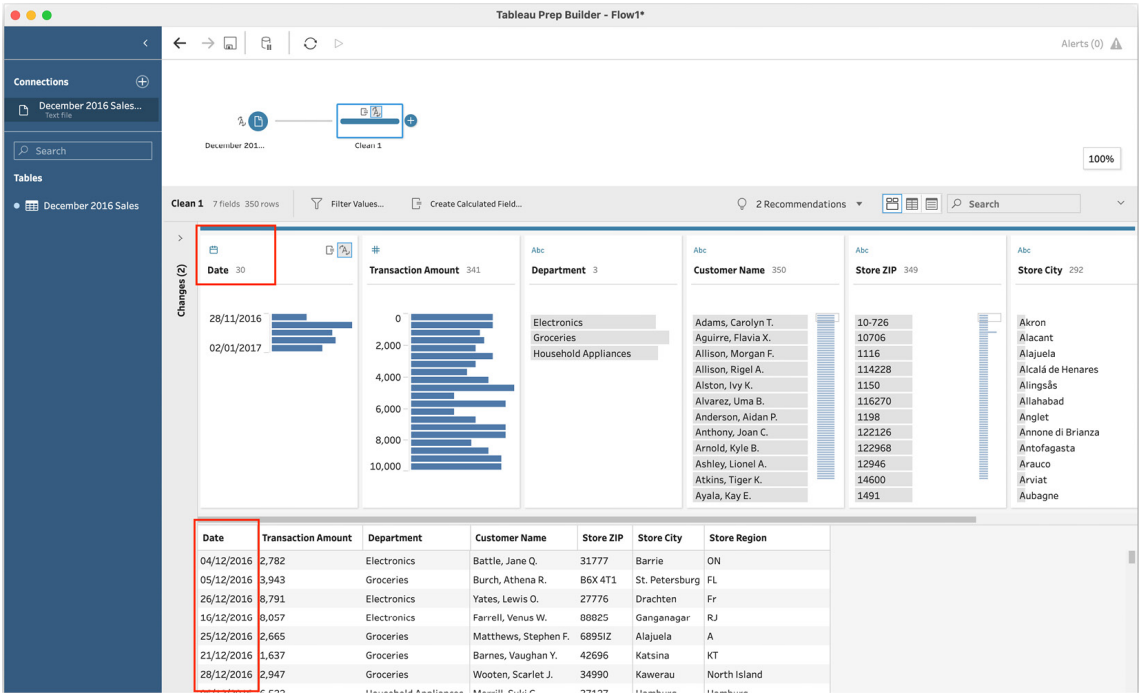
5. Enter the **MID([Date],3,2) + "-" + LEFT([Date],2) + "-" + RIGHT([Date],4)** calculation. We've seen the **LEFT** and **RIGHT** functions in action in previous exercises. The **MID** function is one we have not used before. **MID** returns a substring from a given field, starting at a certain position. In this case, **MID** takes the **Date** field, starts at the third character, and returns the subsequent two characters. In doing so, it returns our month value. Because our source field has a string data type, we can apply string functions, which we've done by adding text in the form of **+ "-" +**. In string fields, the plus symbol concatenates values, rather than adding them:



Important note

As we saw in *Step 3*, the date format in our source is day, month, year. Yet in our calculation, we organized it as month, day, year. The reason for this US-style date formatting is that is the format that Tableau Prep will recognize, as we'll see in *Step 6*.

6. Click **Save** to view your calculation result. Notice how the newly added **Date** calculation has replaced the source **Date** field. It now looks like a date. However, the type is still **String**. Click the type icon for the **Date** field and change it to **Date**:



With these steps completed, you have successfully transformed your data into a proper date format.

How it works...

In this exercise, we learned how to leverage calculations to change a string field to a date. We did so by breaking down the values in our dataset, specifically identifying and extracting the day, month, and year values. We then re-arranged these values and formatted them with additional symbols to create the appearance of a properly formatted date. We then changed the data type to **Date** and in doing so, added benefits to any further calculations you may wish to perform that involve date functions, either in Tableau Prep or an analytics application such as Tableau Desktop.