Story Telling with Tableau

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About this Data

The data set is from the World Bank, collected as part of a pilot study on the feasibility of crowd-sourced price data collection. Price data was collected by non-professionals for thirty specific food items across several months in eight countries. The Excel file contains geographic data (city and country), time data (date of observation), product information (name, quantity) and price (standardized quantities, prices converted to comparable currency).

Creating a Table – *Create a table in SAP HANA, which will be used as data source.*

Steps to create a table in SAP HANA.

1) Logon to the SAP HANA Studio

Start → All Programs → SAP HANA → SAP HANA Studio

If we have already added the SAP HANA database system, go to step 2.

If we have not yet added the SAP HANA database as new system in the SAP HANA Studio, please perform this step now. Details for this step are provided in HANA Reference Guide.

Create a database table for the crowd sourced grocery prices

Use following details to create the table:
Table name: CROWD_SOURCE_GROCERY_PRICES_**379**
Table type: Column Store

Add following columns to the table:

Name	Key	Data type	Length (Dim)
COUNTRY		VARCHAR	20
CITY		VARCHAR	20
OBS DATE		DATE	
PRODUCT CODE		VARCHAR	5
QUANTITY		VARCHAR	10
PRICE		DECIMAL	17,2
PRODUCT NAME		VARCHAR	40

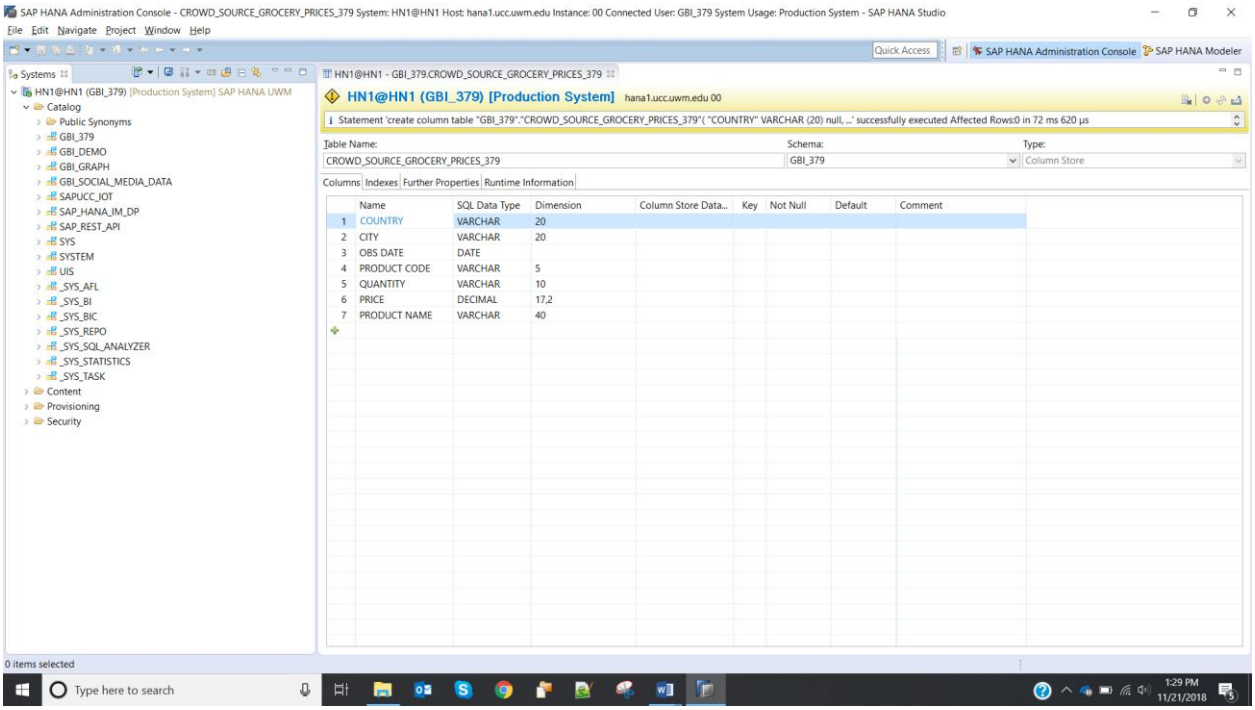
Steps:

a. Navigator View → Catalog → 18_STUDENT_379 → Tables → Right click → New Table

b. Enter Table Name, Field Name, SQL Data Type and Dim (Field Length).

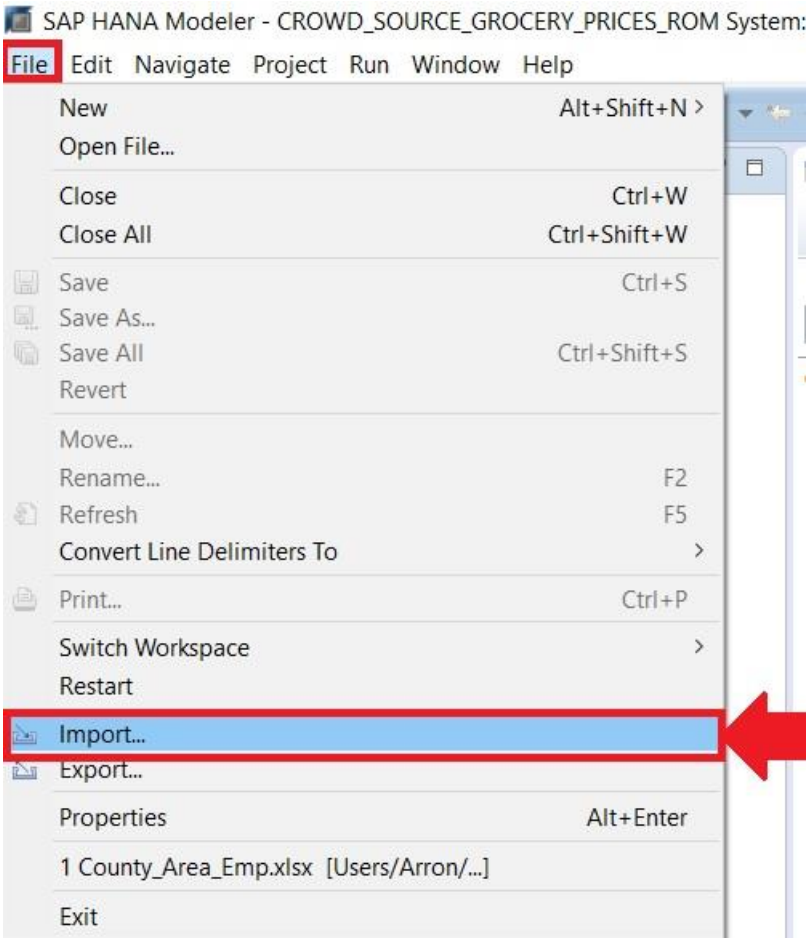
c. Create the table using the Execute button.

The screenshot of the crowd source grocery prices table is:

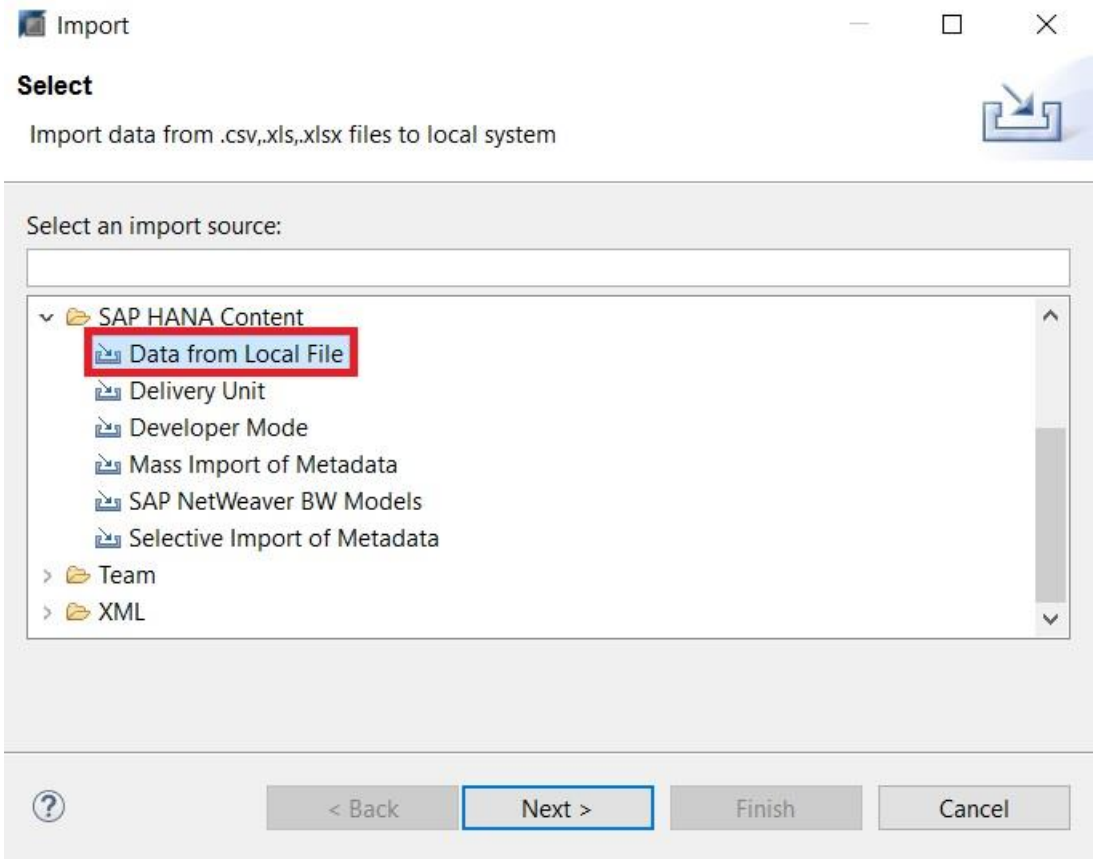


Direct Flat File Import – *Loading data using a flat file into the table created previously.*

Select the HANA System in the Navigator and click on File → Import



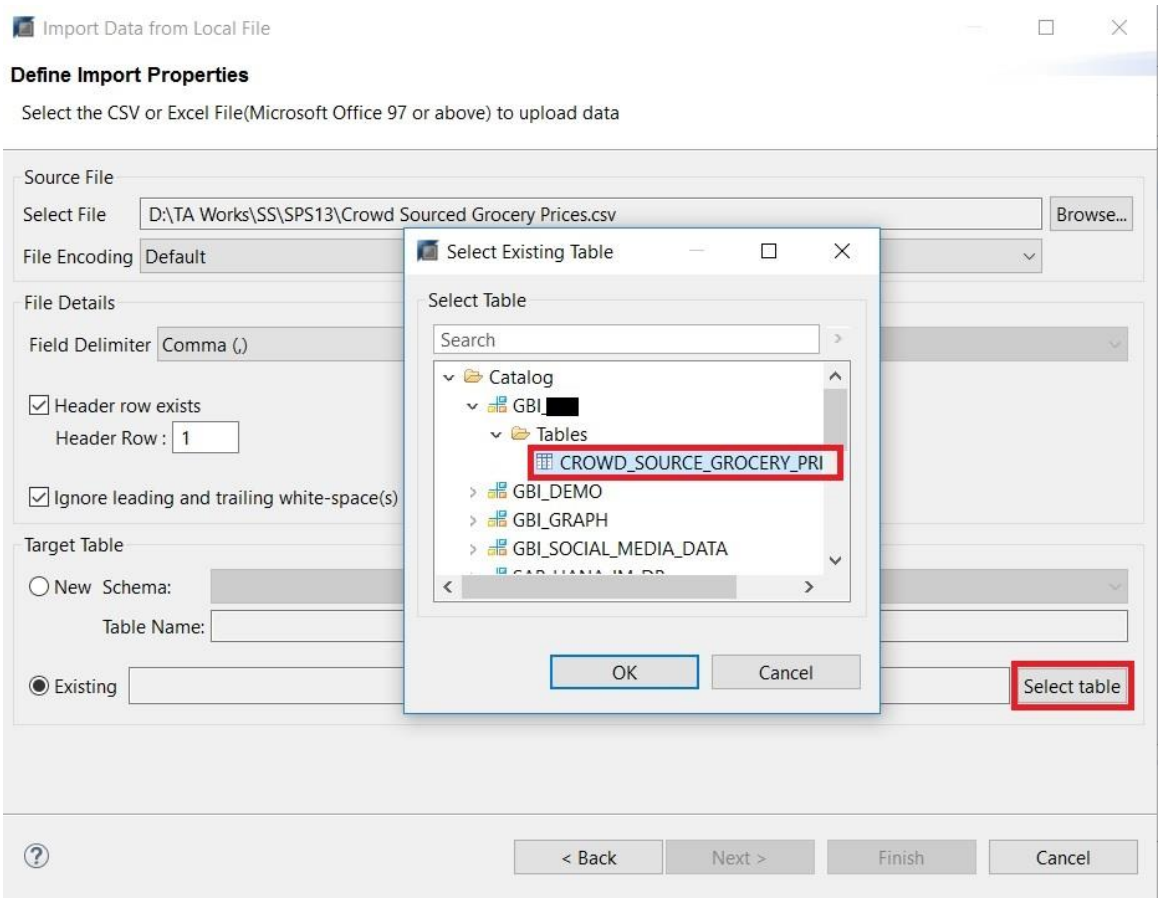
Select SAP HANA Content → Data from Local File and click on Next.



Select the system in which you want to import the flat file and click on Next.

Select Flat File

Click on Browse to the select the file for the import. The different files of the GBI Dataset are located under Desktop → SAP HANA Training GBI Data.
After you selected the file, change the different properties of the file import to match the properties of the CSV-File (as shown in the screenshot).
If you create a new table, make sure that you selected your schema (GBI_379) and that you assigned a proper table name. In this scenario, since you have already created a target table, you can select it by selecting the Existing radio button and clicking on Select Table.



Manage Table Definition and Data Mappings

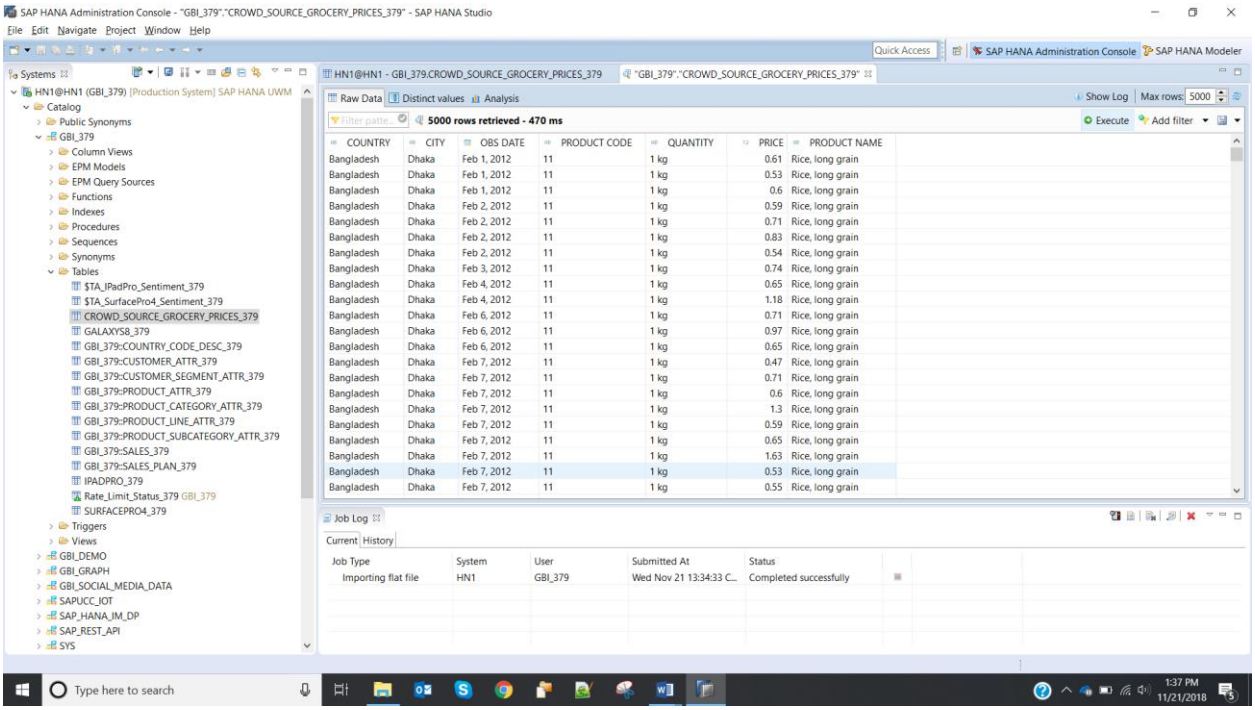
In this step, you can define the properties of the different columns in the target database (in case you are creating a new one), for example column names, data types, keys etc. as well as the mapping of the different file fields to the table columns.

Drag & drop each source field from .csv file to the corresponding target field of Target table as seen in the screenshot.

After we have pressed FINISH, you will be directed to the job log.
If the batch job has been performed successfully, you should see a corresponding message in the bottom line of the job log.

Open the SAP HANA Studio
Navigator View → Catalog → 18_STUDENT_379 → Tables → CUSTOMER_ATTR_379 → Right click→ Open Data Preview.

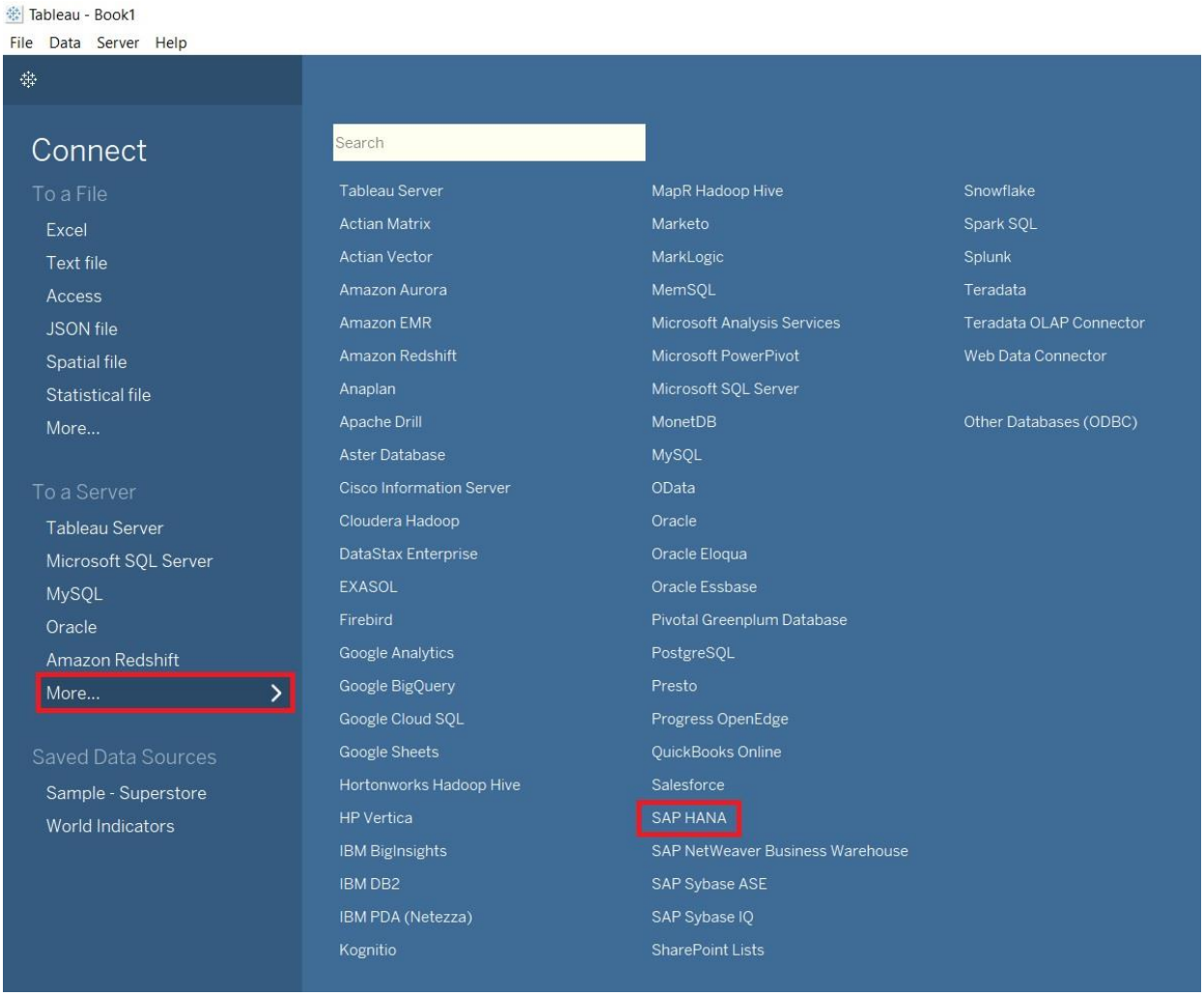
The screenshot of data preview for crowd source grocery prices table is:



Connect to SAP HANA – *Load the table created previously from SAP HANA into Tableau.*

1) Steps to load the table from SAP HANA into Tableau:

1) Open Tableau Desktop
2) Connect to Server->More->SAP HANA



3) A popup will appear, enter the following details:

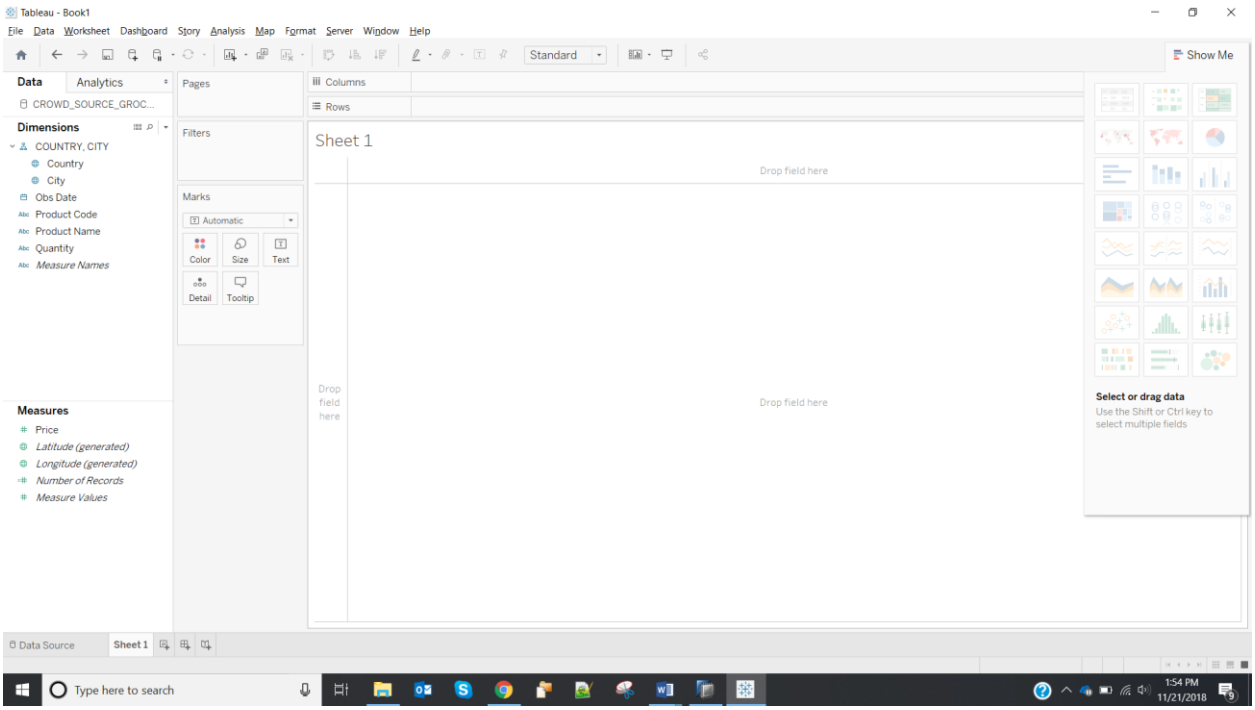
- Server: hana1.ucc.uwm.edu
- Port: 30041
- User ID and password: Enter user id and password.

4) Click on Sign In

5) In Table pane, click Contains and enter the name of your sales table that you created in SAP HANA. Double click on it and under connections, select extract.

6) Click on Sheet 1, which is located in the bottom left section of the screen. A new pop-up will open, click save. Your screen should look like this:

The screenshot of sheet 1 is:



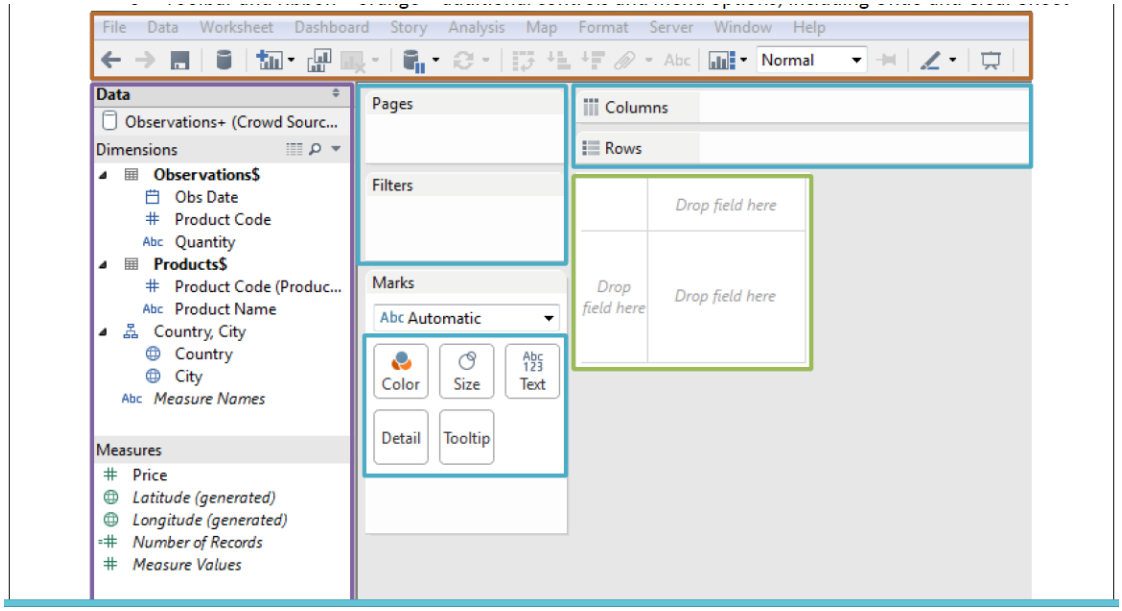
Overview of Tableau Basics and Concepts

• Fields are broken up into Dimensions and Measures.
o **Dimensions** (blue) are categorical fields. They are the labels in a visualization, the buckets that data falls into such as locations, product names, etc.
o **Measures** (green) are quantitative fields. They are the axes in a visualization, the numbers that can be analyzed, such as price and counts of records.

• Tableau creates some fields that can be used in a visualization that do not exist in the original data set.
o If the data set contains geographic fields, such as country or city, Tableau searches an internal database and generates **Latitude** and **Longitude** fields. This enables the geographic data to be plotted on a map
o **Number of Records** is a simple count of rows in the data set

• **Show Me** can be accessed in the upper right corner of the screen. With field(s) selected, Show Me offers one-click options for chart types

• The Tableau canvas
o Data window – purple – drag fields from here to bring them into the view
o Shelves – blue – areas where fields can be placed to control exactly how they appear in the view
o Canvas – green – where the visualization is built. Fields can be placed directly here as well as on shelves
o Toolbar and ribbon – orange – additional controls and menu options, including Undo and Clear Sheet


File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Normal
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Product Name
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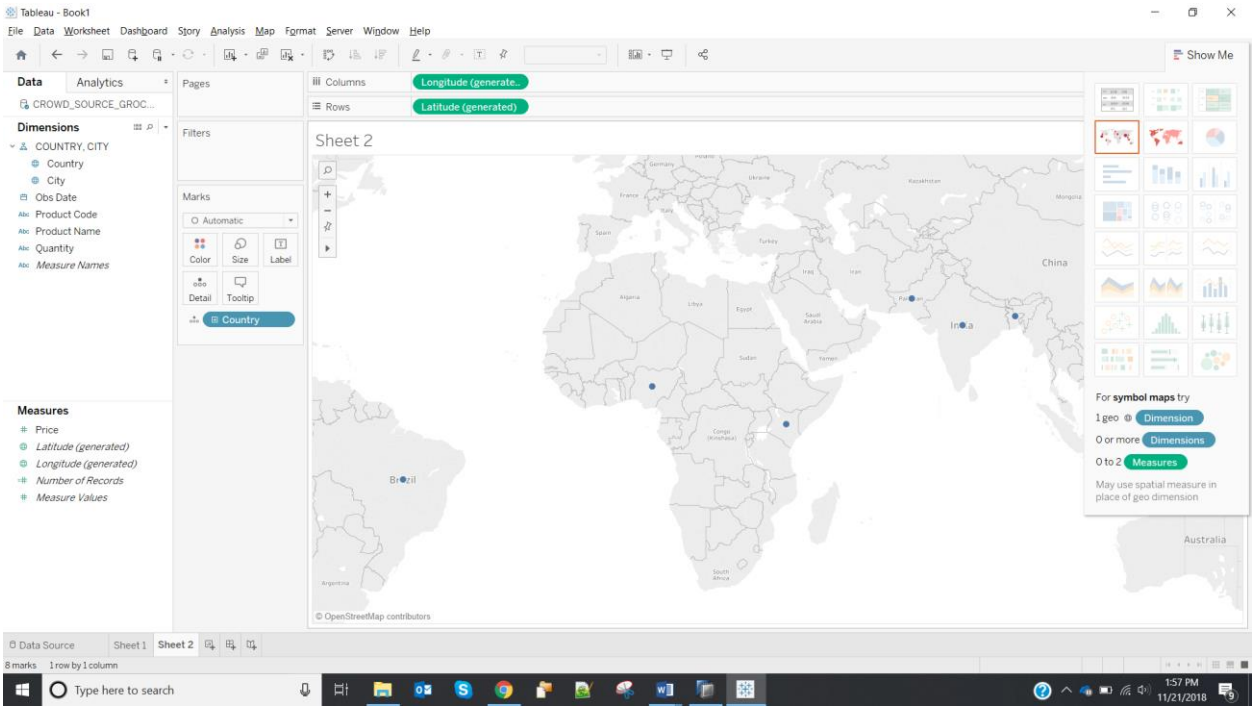
City
Measure Names
Measures
Price
Latitude (generated)
Longitude (generated)
Number of Records
Measure Values
Pages
Filters
Marks
Automatic
Color
Size
Text
Detail
Tooltip
Columns
Rows
Drop field here
Drop field here
Drop field here

2) Plot countries as a map

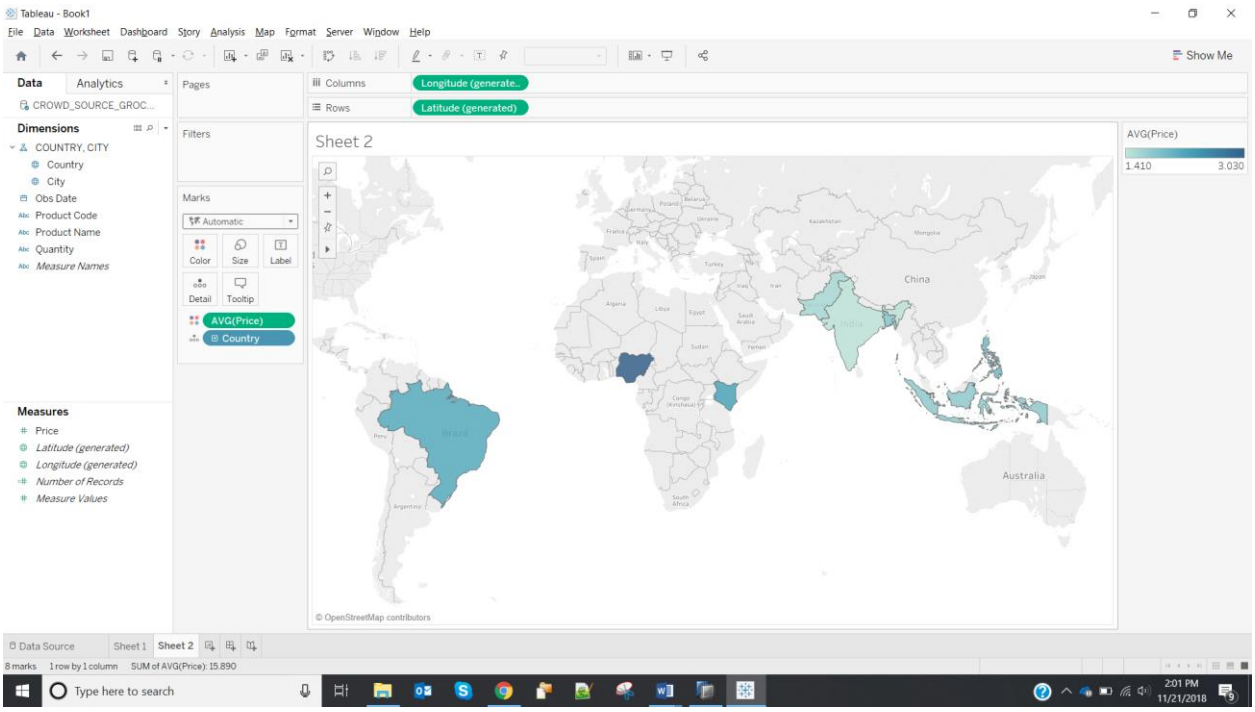
1) Clear the sheet  (in the ribbon) or create a new sheet (at the bottom)
2) Drag **Country** from the data window to the canvas
a. If you get anything other than a map, undo and try dropping the field **Country** into the large, bottom right rectangle that says “Drop field here”. Alternatively, double click on the field name to bring **Country** out as a map
b. Note that the generated Latitude and Longitude were automatically plotted on the Rows and Columns shelves.

The screenshot after dragging country is:



3)To analyze which country has the most expensive average price.

1) Drag **Price** from Measures to the Color shelf (button)
a. This should create a filled map colored on a gradient of “SUM(Price)”
The default aggregation for measures is **SUM**.
2) Right click on the pill on the Marks Card that says “SUM(Price)”
a. Click on the option “Measure(Sum)”
b. Click on “Average” to change the aggregation from Sum to Average

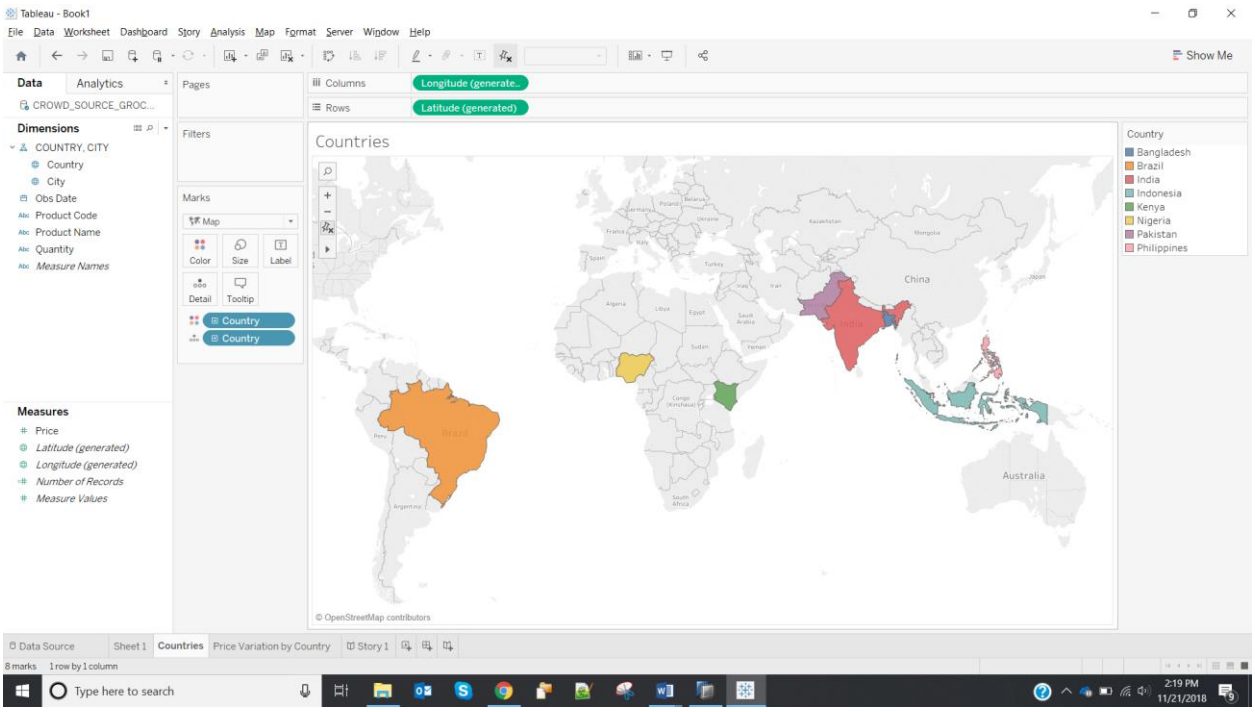


The country that has the highest average price is **Nigeria**

4) Make a filled map of countries

1) Clear the sheet
2) Double click on **Country** to plot the map
3) Drag **Country** from the data window to the color shelf
4) Select the dropdown on the Marks card and change from “Automatic” to “Filled Map”
5) Right click on the sheet tab and Rename the sheet “Countries” and create a new sheet

The screenshot of filled map of countries is:

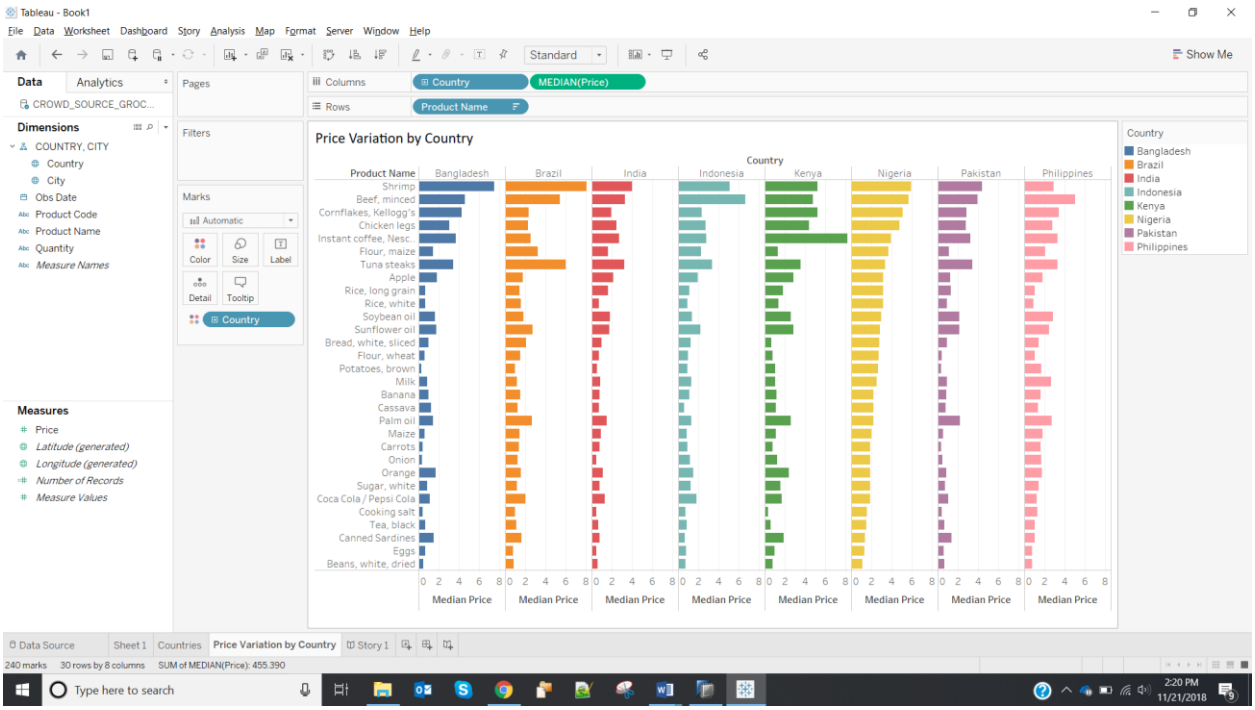


5) To analyze how much variation is there in product prices across each country

Steps:

1) Click on New Sheet.
2) Holding down the Control key (Command on a Mac) click to select the fields: **Product Name**, **Price**
3) With those two fields selected, click on the Show Me tab
4) Select the Horizontal Bar Chart and click the Show Me tab again to close it
5) Right click on the "SUM(**Price**)" pill on the Columns shelf
a. Click on the option "Measure(Sum)"
b. Click on "Median" to change the aggregation from Sum to Median
6) Hover over the words "Median Price" on the X axis until the Sort icon appears. Click the icon to sort
7) Drag **Country** from the Rows shelf to the Columns shelf in front of **Price**.
8) Drag a new copy of **Country** from Dimensions to the Color shelf
9) Right click on the sheet tab and rename the sheet "Price Variation by Country"

The screenshot of price variation by country is:



We can compare the median product prices in a category for different countries.

Brazil is the highest in shrimp prices, Indonesia in beef, minced, Kenya in coffee. From the pattern, we can infer that **Nigeria** has higher prices than other countries.

6) Story

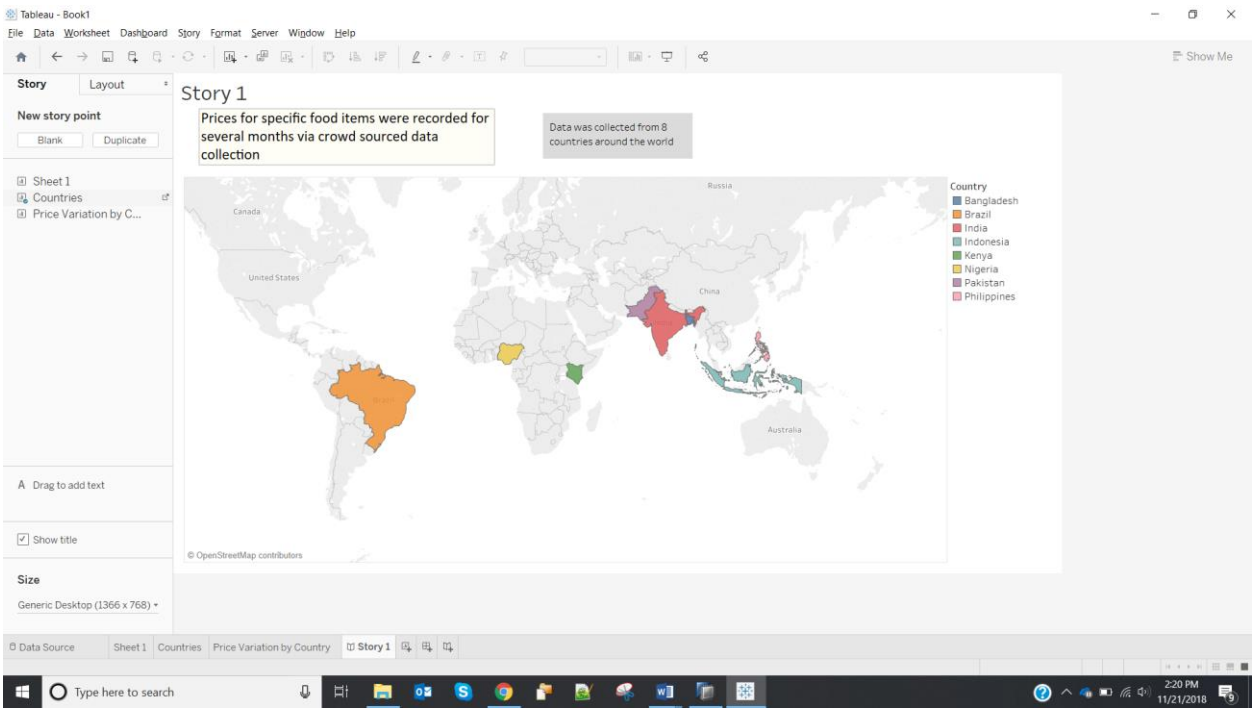
Create a Story using the visualizations created above to tell the story of the data. Stories can have captions, floating descriptions, and are fully interactive. Filter selections can be saved (updated) or duplicated as new points.

Detailed Steps:

I. Create a story and add a point with description

1) Click “Story” in the ribbon and select “New Story”
2) If necessary, use the sizing menu in the bottom left corner to adjust the size of the story to fit your screen (laptop or automatic)
3) Click and drag out **Countries** (Map)
4) Click in the navigator box to add a caption for the map
a. “Data was collected from 8 countries around the world”
5) Click and drag out the Description option from the left pane to add a comment about the map
a. “Prices for specific food items were recorded for several months via crowd sourced data collection”

The screenshot of the story (Countries) is:



II. Add another point and modify the visualization

Click on "New Story Point - **Blank**"

6) Double click **Price Variation by Country**
7) Click in the navigator box to add a caption
a. “Prices of the food products varied between countries”
8) Go back to the sheet for **Price Variation by Country**
9) In the ribbon, use the drop down to change the fit from “Normal” to “Entire View”
a. If you want to maximize screen real estate, you can remove the color legend. Click on the caret on the Countries color legend and select “Hide Card”
10) Click back on the story to verify there are no longer scroll bars on the story
a. Note: most changes to a visualization must be made on the underlying sheet, not in the Story

It appears like the following screen:

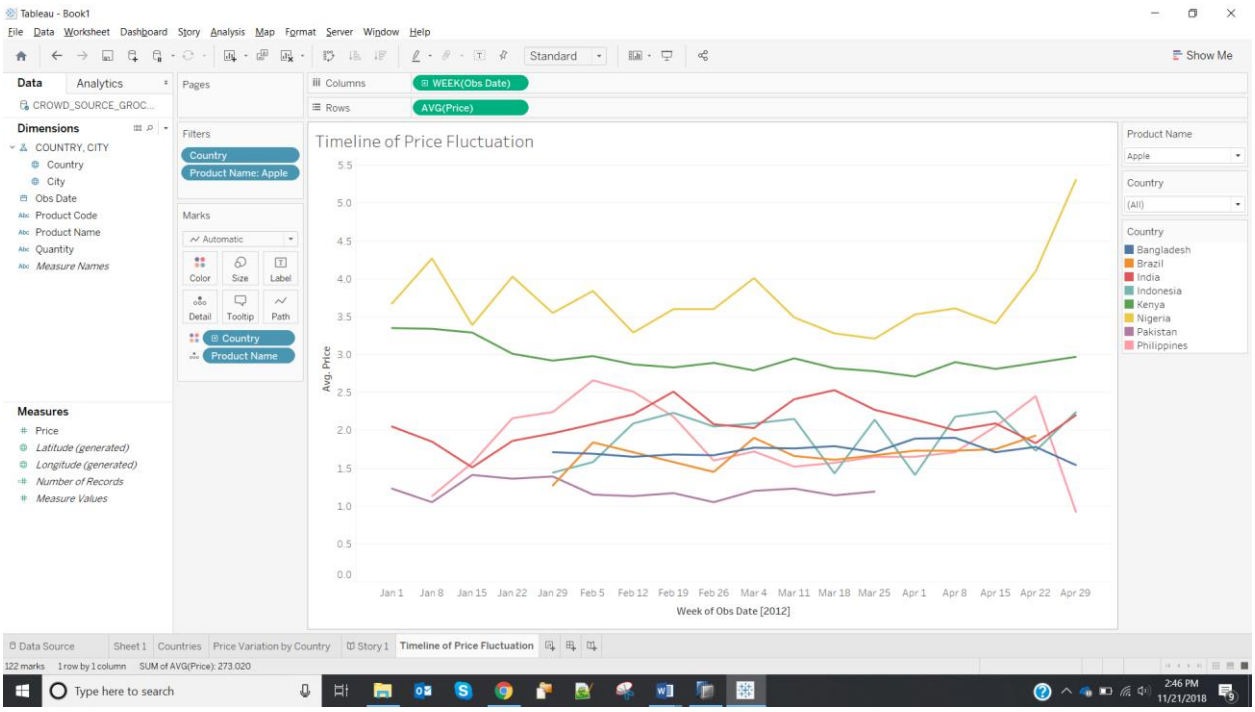
III. Showcase interactivity and saving a specific state of a visualization

11) On the current point (“Prices of the food products varied between countries”),
a. Hold down the control key (command key on a Mac) and click on several bars that don’t seem to fit the overall trends
12) Click the button “New Story Point - **Duplicate**”
a. This duplicates the point – the visualization is the same but with those selections still highlighted
b. If you want to change which bars you’ve selected, you can select other bars and click “Update” above the navigator box to save those modifications
13) Click in the navigator box to add a caption
a. “Which products were more expensive varied by country”

7) Dashboards and Stories

Detailed Steps:
Are there price fluctuations or have prices held fairly steady?
1) Create a new sheet
2) Drag **Obs Date** to the Columns shelf
3) Right click on the pill and select the option “Week Number”
4) Drag **Price** to the Rows shelf
5) Right click on the “SUM(**Price**)” pill on the Rows shelf
a. Click on the option “Measure(Sum)”
b. Click on “Average” to change the aggregation from Sum to Average
6) Drag **Country** to Color
7) Right click on **Country** anywhere you see it and select “Show Quick Filter”
a. If desired, click on the caret in the upper right corner of the filter to bring up the menu and select “Multiple Value (Dropdown)”
8) Drag **Product Name** to Detail
9) Right click on **Product Name** anywhere you see it and select “Show Quick Filter”
a. Click on the caret in the upper right corner of the filter to bring up the menu and select “Single Value (Dropdown)”
10) Right click on the sheet tab and rename the sheet “Timeline of Price Fluctuation”

The screenshot of Timeline of Price Fluctuation is:

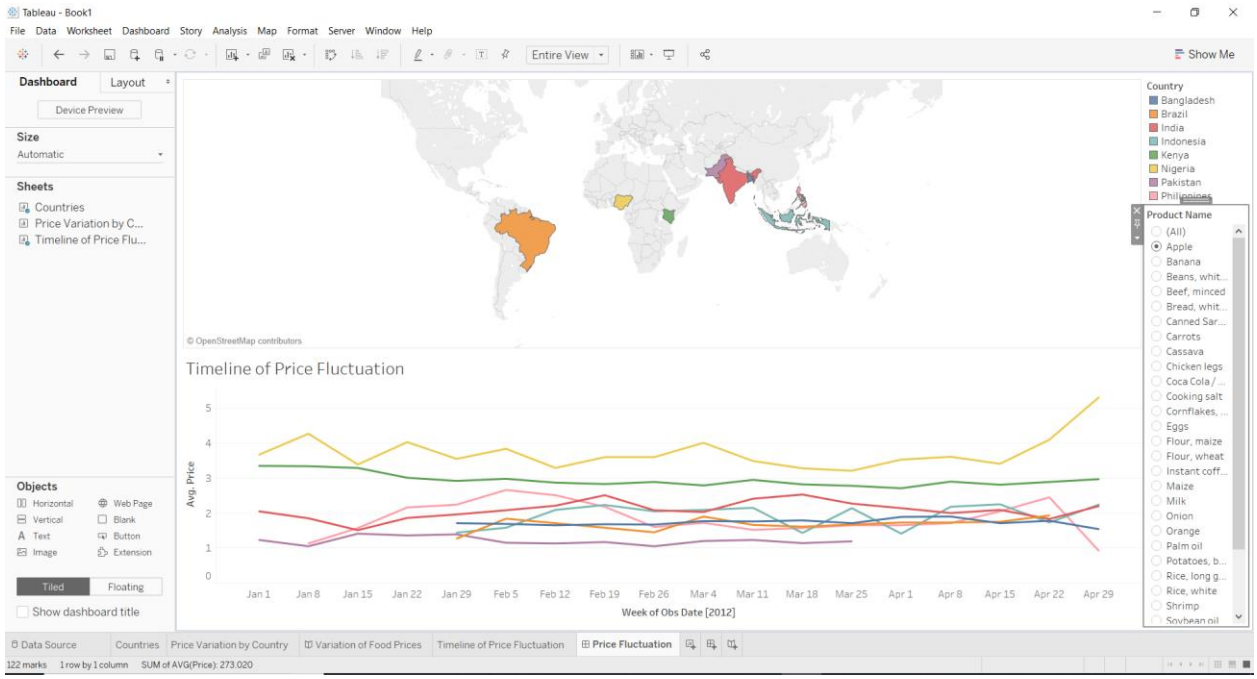


There have been fluctuations in prices. However, a few countries have very less fluctuations in prices as can be seen from the timeline.

8) Creating Dashboard

Steps:
1) Create a blank dashboard by clicking on the tab at the bottom
2) Drag out **Countries**
3) Drag out **Timeline of Price Fluctuation** to the bottom
4) Click on the map to bring up its border
    a. At the top right corner, click the caret to bring up the menu
    b. Select “Use as Filter” to set the map as a filter for the timeline
5) Right click on the title “Countries” above the map and chose “Hide title”
6) Click on the name of the Product Name quick filter to bring up the border
a. At the right top corner, click the caret to bring up the menu
b. Choose “Single Value (List)
c. If desired, close the Country color legend by clicking to bring up the border and clicking the X
7) Double click on the tab to rename the sheet **Price Fluctuation**

The screenshot of Dashboard is:



9) Back on the Story

IV. Add another point and finish the story

14) Double click **Price Fluctuation** to bring it out to the story

15) If the dashboard doesn't fit well:

a. Go back to the sheet for the dashboard

b. At the bottom left corner, open the Size flyout menu

c. Select "Fit to Story 1"

d. Go back to the story

16) Click in the navigator box to add a caption

a. "Explore the dashboard to see how prices changed over time"

17) Click and drag out the Description to add a caption

a. "Click on a country to see just the records for that country"

b. "Click on a product (or "All") to change the timeline"

18) Double click "Story Title" to add a title to the story

a. "Variation of Food Prices"

The screenshot of the story is: