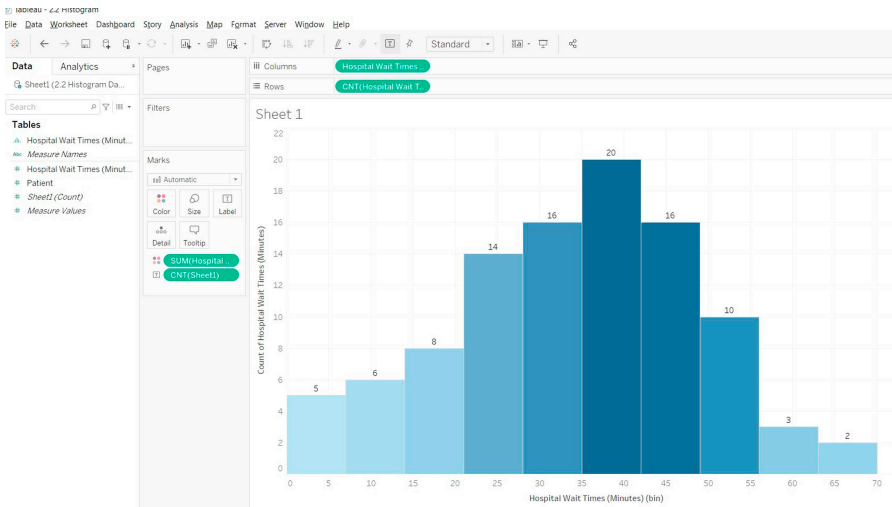

FIGURE 2.22 Final histogram.

2.3 BUTTERFLY CHART

2.3.1 Introduction of Butterfly Chart

The butterfly chart is useful to compare two data sets. It is often called the Tornado chart or Divergent chart. This chart uses horizontal bars for two data sets, and their X-axis values start from the center, which makes the plot like the butterfly wings.

2.3.2 Tableau Example

Table 2.5 shows the flow width (microns) measurements data for two different Wafers types over ten days. The goal is to see any difference in flow width between two wafers over ten days.

Step 1: Open the "Butterfly chart data" Excel file in Tableau. Click "Sheet1". You may be able to see the measure names in the left-hand side panel (Figure 2.23).

Step 2: Drag and drop the "Day" in Rows [1] on the shelf. Drag and drop the "Wafer A" [2] and "Wafer B" [3] variables in the Columns in the shelf (Figure 2.24).

Step 3: For the drop-down menu [1] in Marks, select the "Bar" shape [2] (Figure 2.25).

Step 4: Right-click a blank space on the left sidebar and choose "Create calculated field" (Figure 2.26).

Step 5: Create "Central Axis" and set 0 value. Hit OK (Figure 2.27).

TABLE 2.5
Flow Width (Microns) Measurement Data for Two Different Wafers Over 10 Days

Day	Wafer A	Wafer B
1	1.597	1.4128
2	1.6887	1.3592
3	1.4720	1.4039
4	1.1449	1.5821
5	1.3688	1.4738
6	1.5220	1.3281
7	1.7559	1.4177
8	1.1928	1.5265
9	1.6914	1.3574
10	1.4573	1.5089

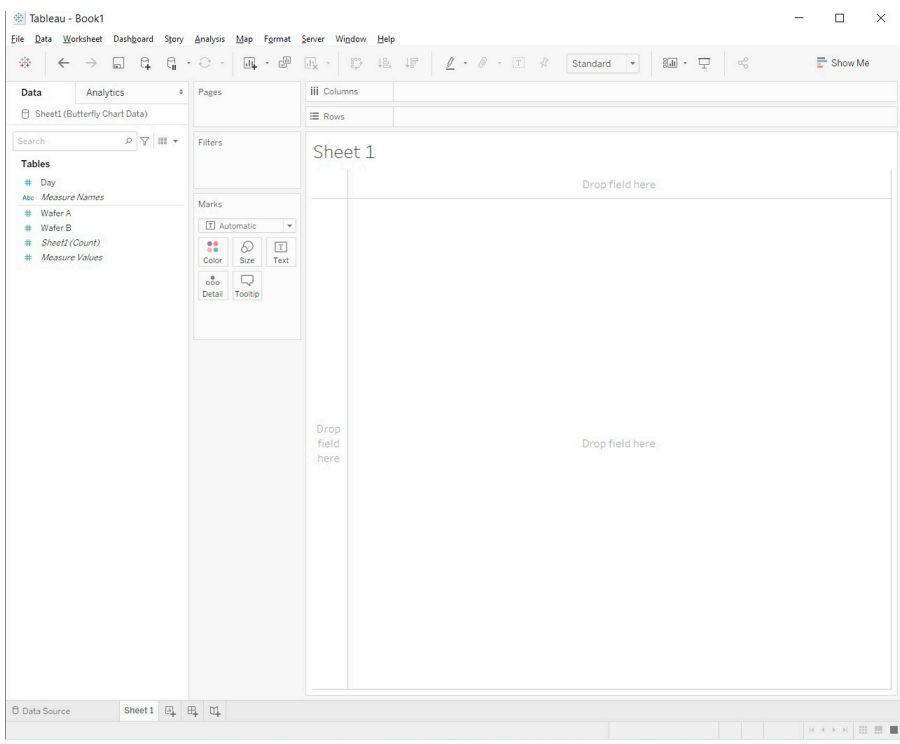

FIGURE 2.23 Step 1 in Section 2.3.

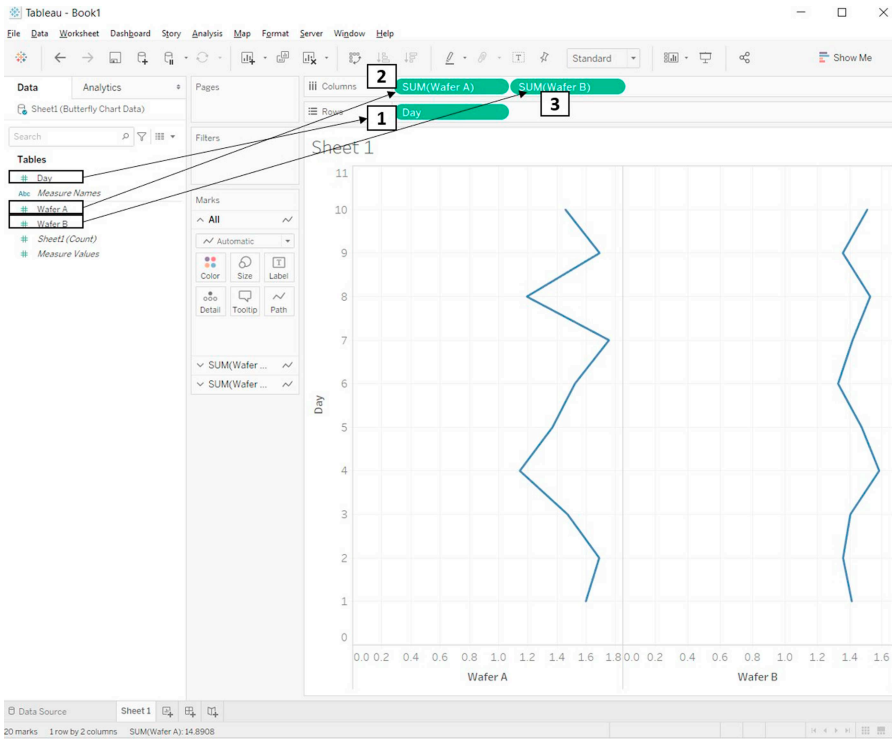

FIGURE 2.24 Step 2 in Section 2.3.

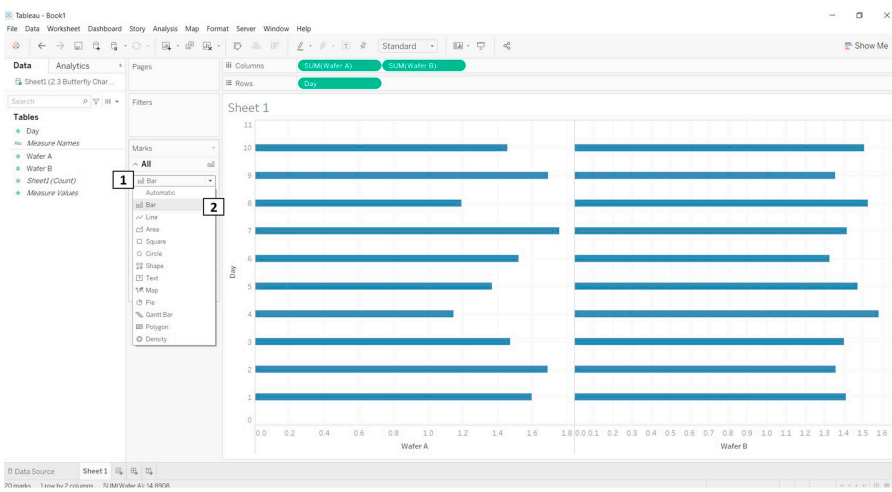

FIGURE 2.25 Step 3 in Section 2.3.

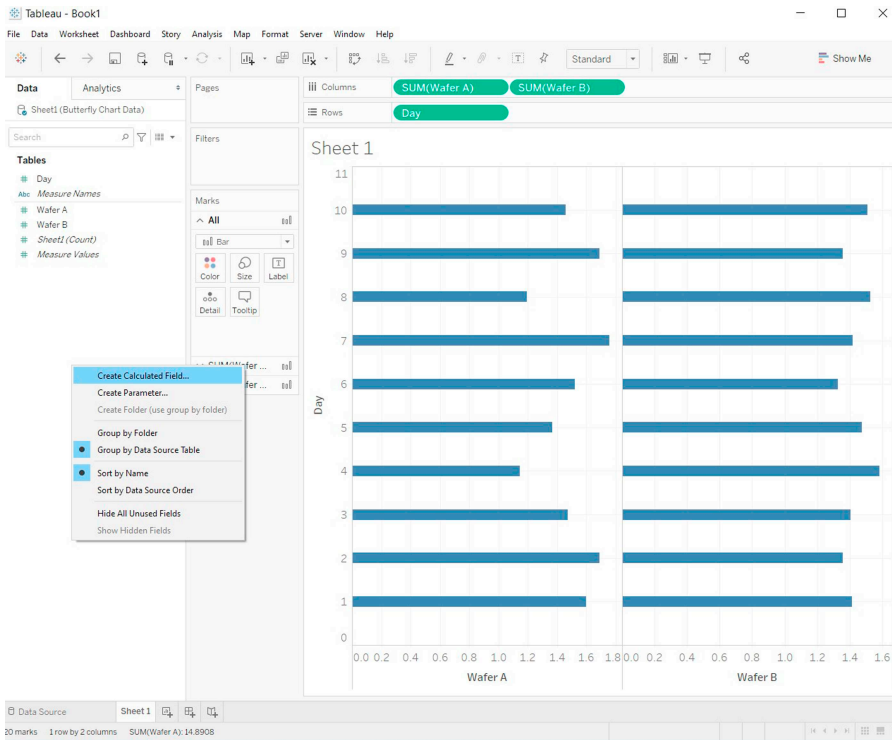

FIGURE 2.26 Step 4 in Section 2.3.

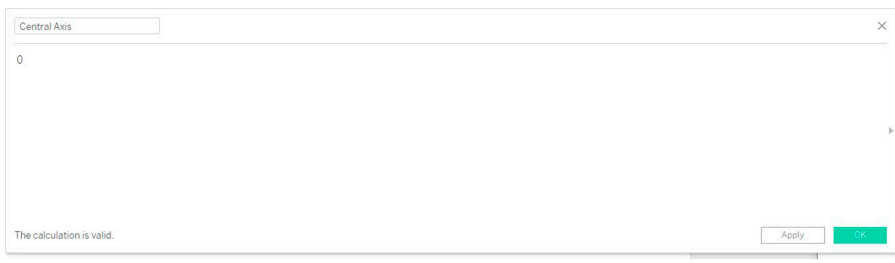

FIGURE 2.27 Step 5 in Section 2.3.

Step 6: Drag and drop the "Central Axis" between the "Wafer A" and "Wafer B" pills [1] in the Columns (Figure 2.28).

Step 7: Select the Central Axis section in Marks [1]. Drag and drop "Day" in Label under Marks [2]. Select "Text" shape [3] for the drop-down menu under Marks (Figure 2.29).

Step 8: Right-click around "Central Axis" and select "Edit Axis" (Figure 2.30).

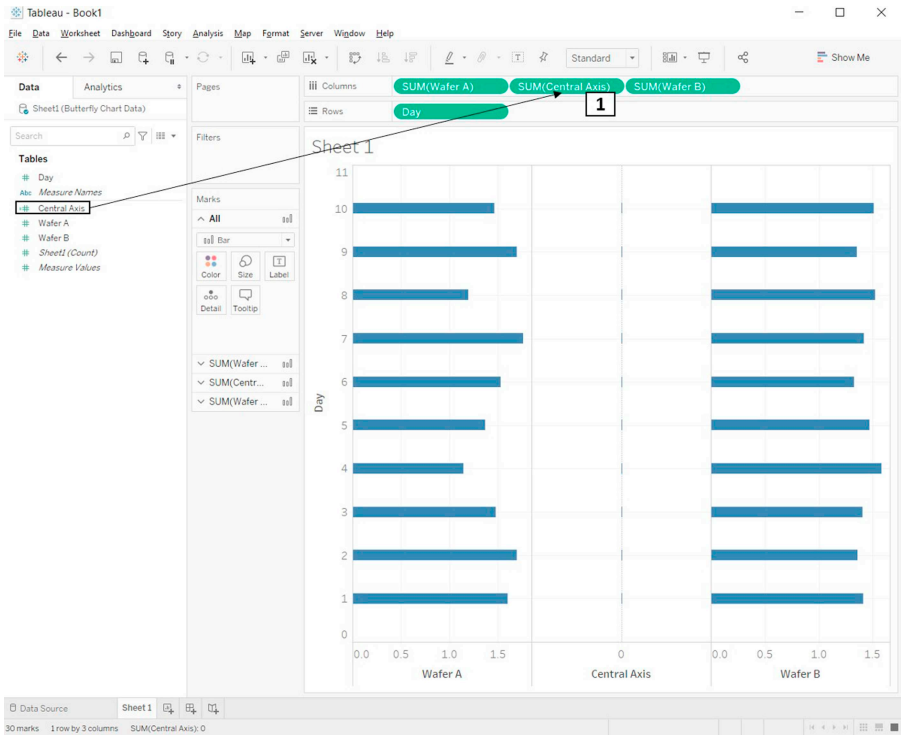

FIGURE 2.28 Step 6 in Section 2.3.

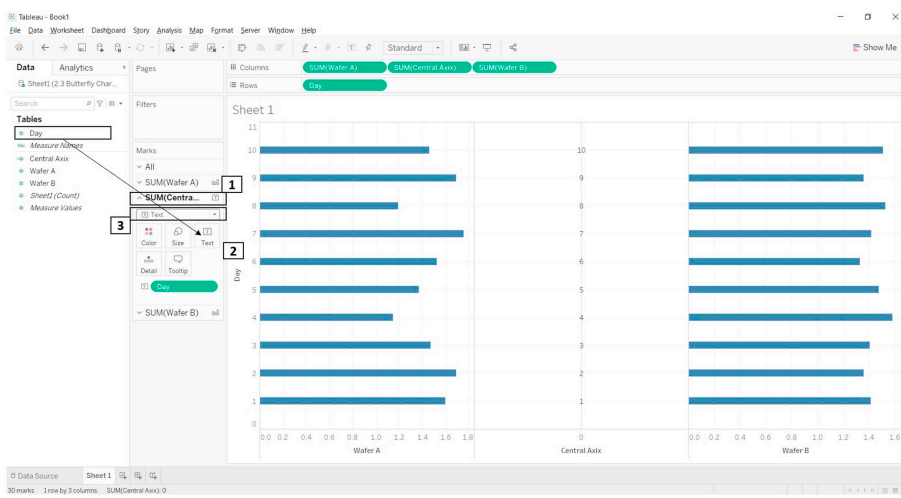

FIGURE 2.29 Step 7 in Section 2.3.

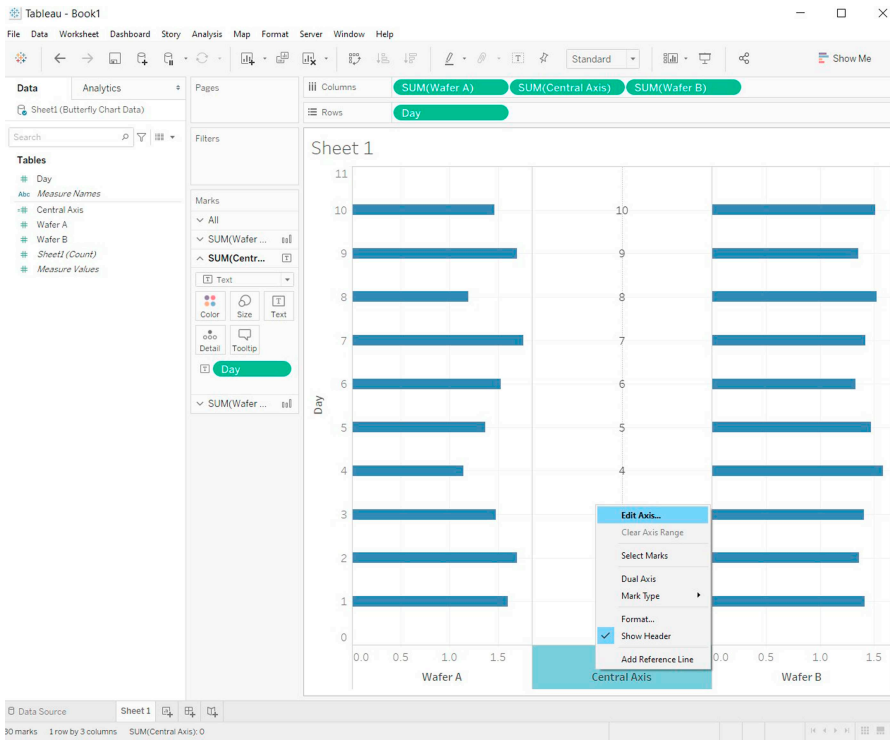

FIGURE 2.30 Step 8 in Section 2.3.

Step 9: Go to the Tick Marks tab and set both Major and Minor tick marks as none (Figure 2.31).

Step 10: Right-click around "Day" and uncheck "Show Header" for Wafer A (Figure 2.32).

Step 11: Right-click around "Wafer A" and select "Edit Axis" (Figure 2.33).

Step 12: Under the General tab, check the scale as "Reversed" (Figure 2.34).

Step 13: Under the SUM(Central Axis) pill, right-click and select "Dual Axis" (Figure 2.35).

Step 14: Right-click around "Wafer A" then check "Synchronize Axis" of Wafer A (Figure 2.36).

Step 15: Right-click around "Wafer A" and select "Edit Axis" for "Wafer A" variable. Under the General tab, set 0 as a Fixed start and set Automatic as an end (Figure 2.37).

Step 16: Similarly, drag and drop "Central Axis" in the Columns right next to "SUM (Wafer B)" pill [1]. Drag and drop "Day" variable Label for SUM (Central Axis) under Marks [2]. Select "Text" [3] for the drop-down menu (Figure 2.38).

Step 17: Right-click around "Central Axis" then check "Dual Axis" for the Central Axis (Figure 2.39).

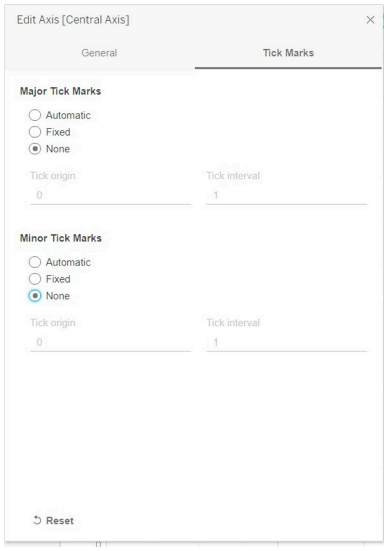

FIGURE 2.31 Step 9 in Section 2.3.

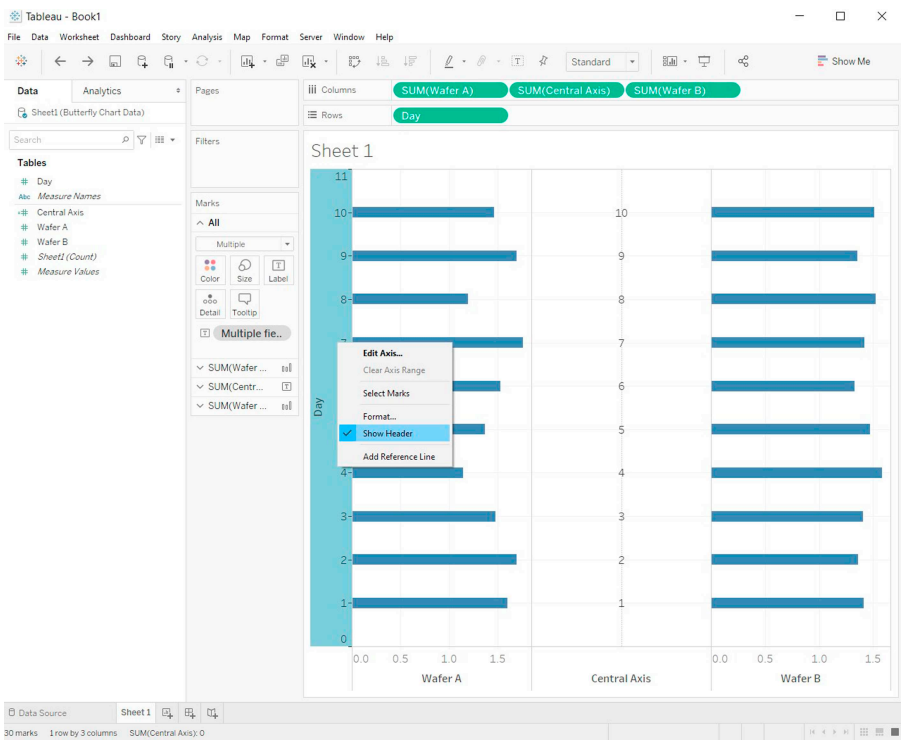

FIGURE 2.32 Step 10 in Section 2.3.

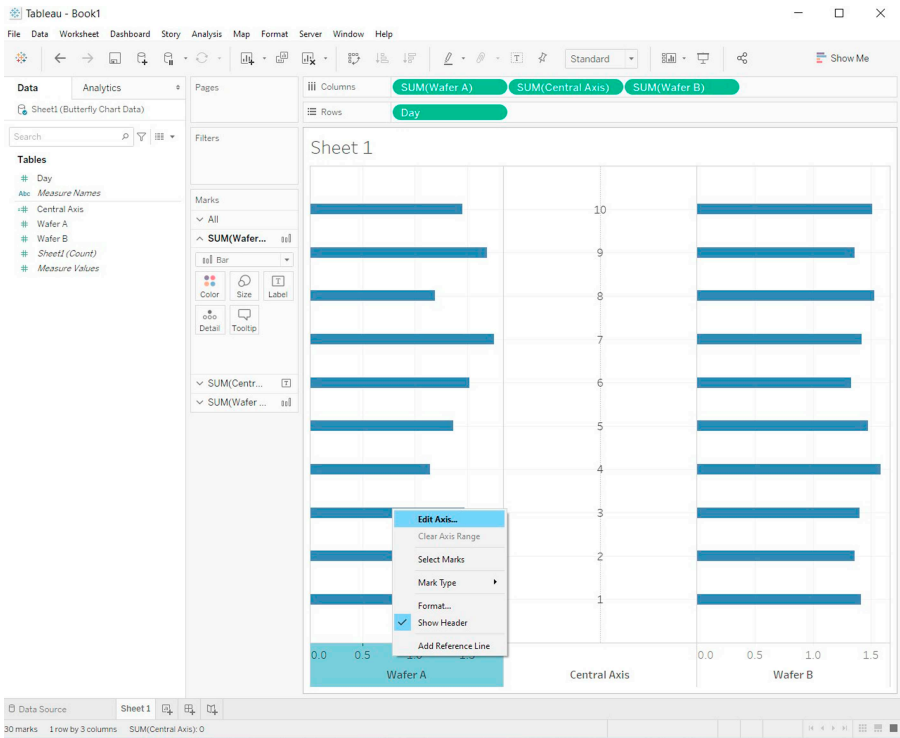

FIGURE 2.33 Step 11 in Section 2.3.

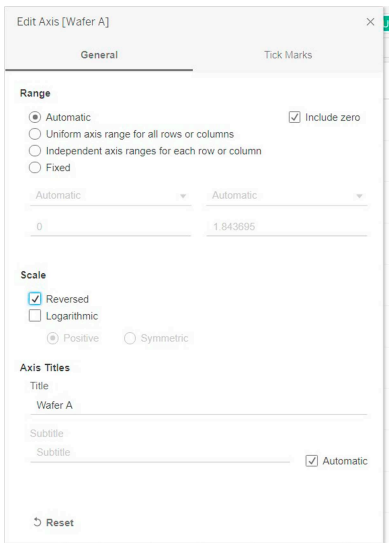

FIGURE 2.34 Step 12 in Section 2.3.

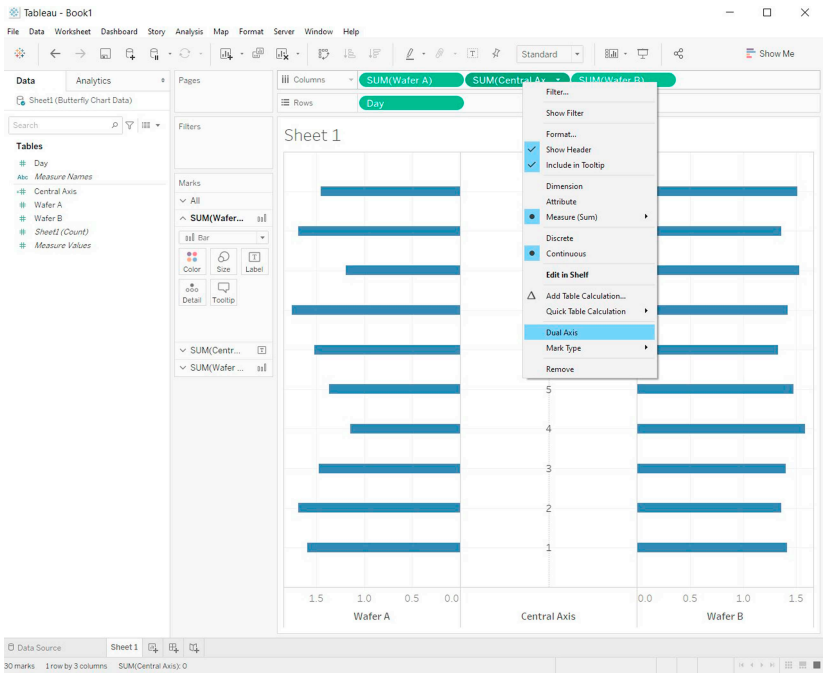

FIGURE 2.35 Step 13 in Section 2.3.

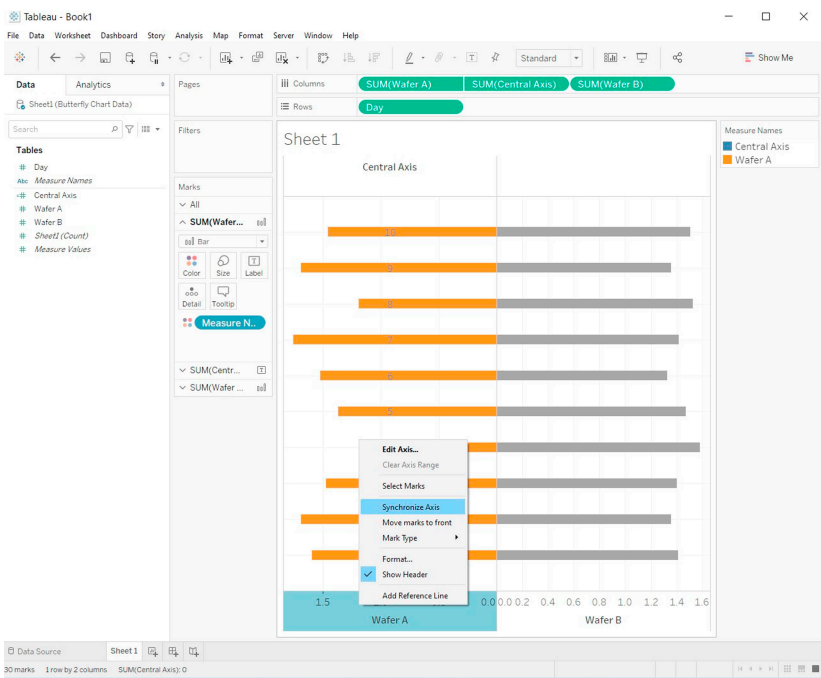

FIGURE 2.36 Step 14 in Section 2.3.

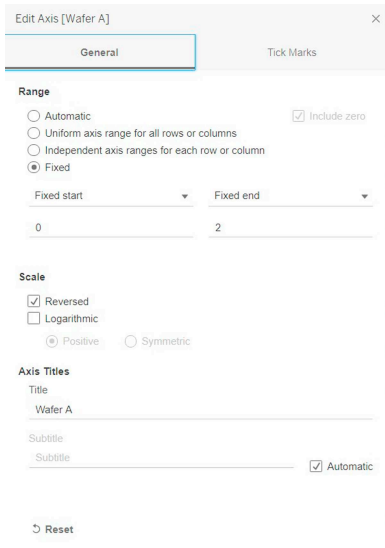

FIGURE 2.37 Step 15 in Section 2.3.

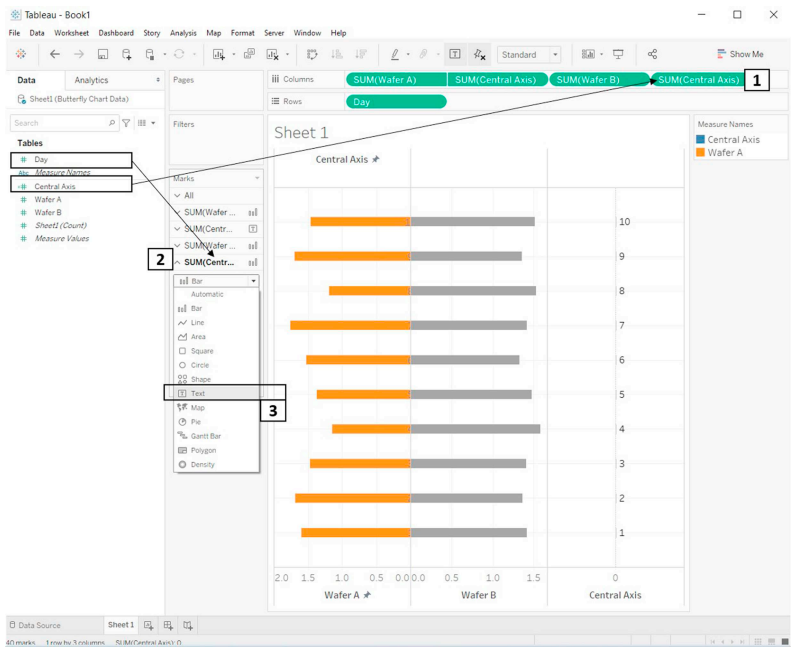

FIGURE 2.38 Step 16 in Section 2.3.

Step 18: Right-click around "Wafer B" then check "Synchronize Axis" of "Wafer B" variable (Figure 2.40).

Step 19: Right-click around "Wafer B" then select "Edit Axis" of the "Wafer B" variable. Set "Fixed start" as 0 and "Fixed end" as 2 (Figure 2.41).

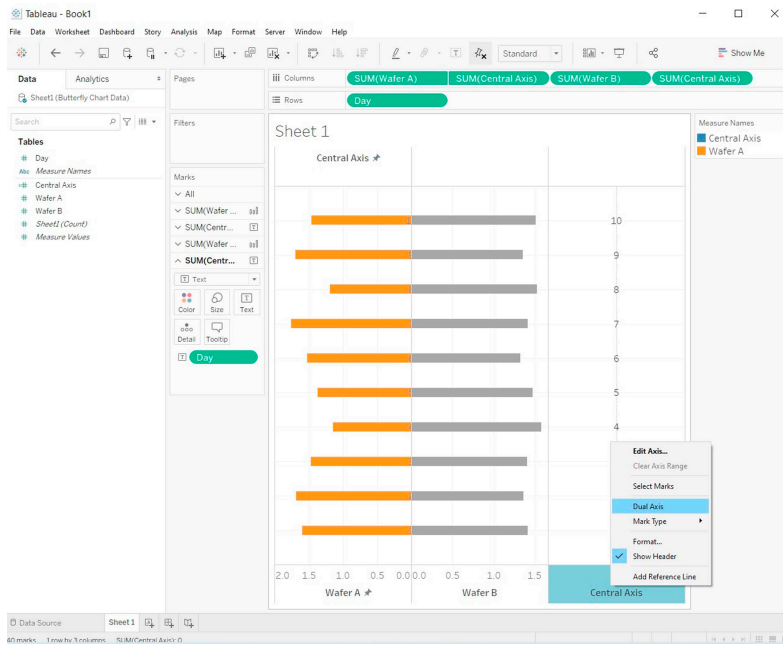

FIGURE 2.39 Step 17 in Section 2.3.

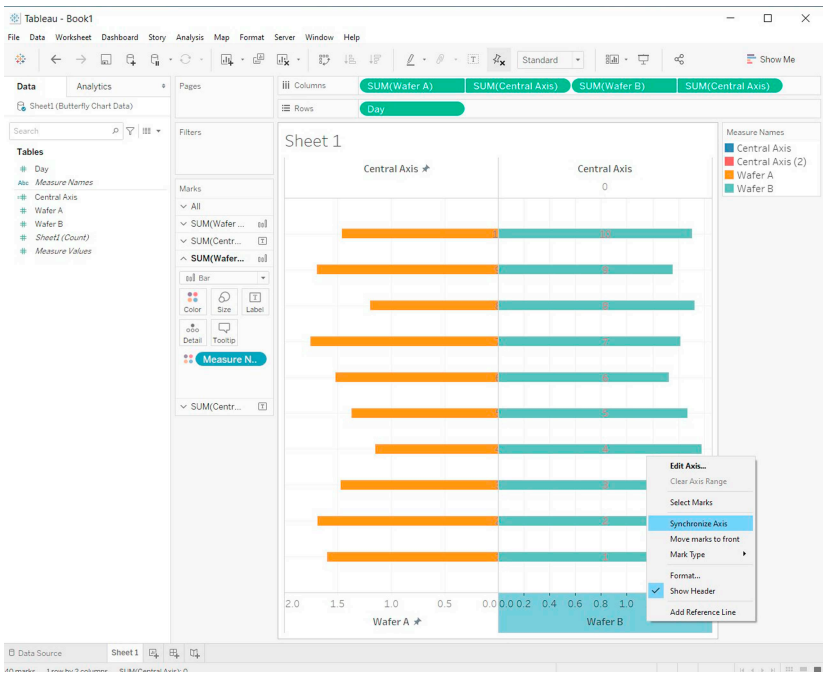

FIGURE 2.40 Step 18 in Section 2.3.

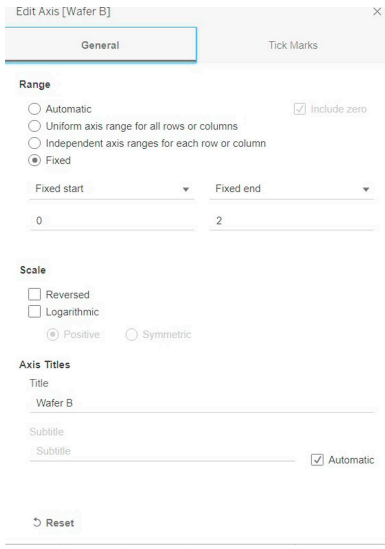

FIGURE 2.41 Step 19 in Section 2.3.

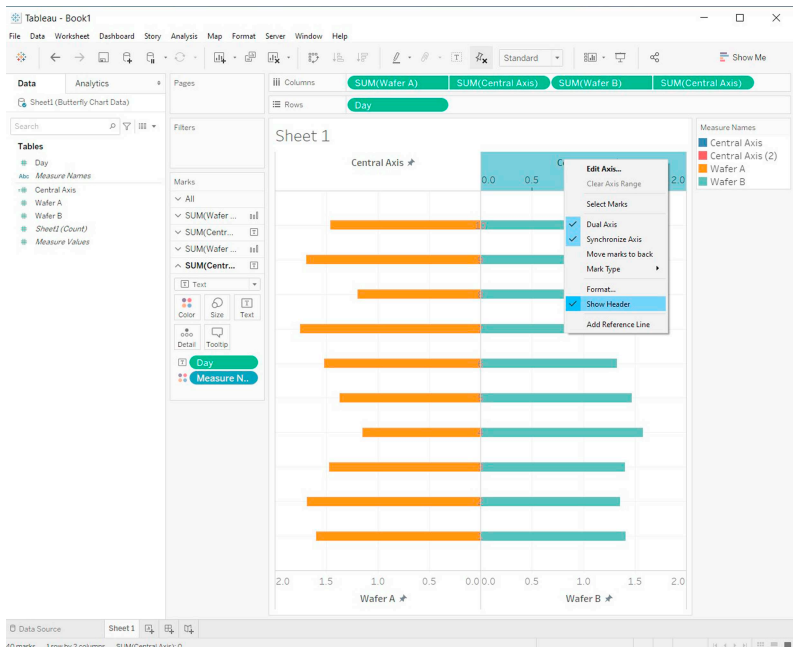

FIGURE 2.42 Step 20 in Section 2.3.

Step 20: Right-click then uncheck "Show Header" of "Wafer B" variable (Figure 2.42).

You would be able to see the final butterfly chart.

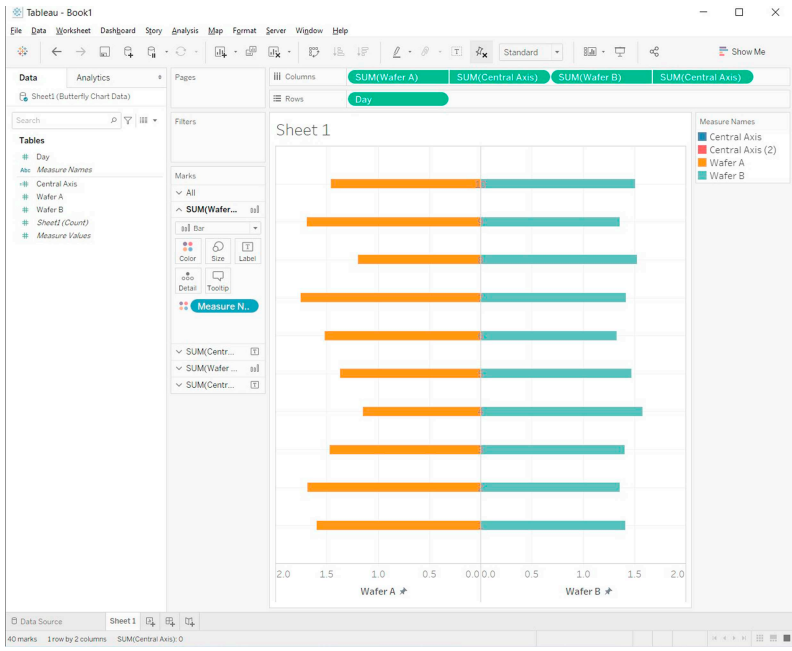

FIGURE 2.43 The final butterfly chart of the flow width in Wafers A and B.

Based on the butterfly chart (Figure 2.43), we can see that Wafer A tends to have a larger flow width than Wafer B. In addition, Wafer A has more variation of the flow width over ten days compared to Wafer B. It suggests that Wafer B may have a better quality control of the flow width than Wafer A.

2.4 DONUT CHART

2.4.1 Introduction of Donut Chart

Donut charts are a type of pie chart that shows the proportion of categorical data. The proportion of individual categories is related to the size of each piece in the chart. On top of that, there is a hole in the middle, which differentiates from a traditional pie chart. The information of the total amount of data often is shown in this hole. Table 2.6 shows the sample data of video game sales (https://www.kaggle.com/gregorut/videogamesales), consisting of rank, genre, publisher, and global sales amount (in millions) worldwide. There 16,598 records of the information in the full data set. We could use Tableau to understand which genre accounts high portion of global sales in a video game. This would help understand the potential needs of the video game that will be published by the company.