

## Tableau Exercise Week 4

The following exercises are not marked. However, the skills taught in these exercises are essential.

Please post your questions about these non-assessable exercises on the Ed forum.

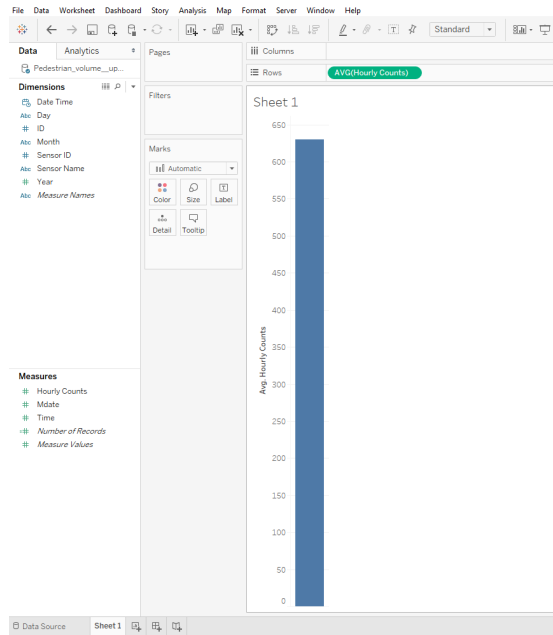
### 1. Tableau: Dual Axis Visualisation

In this tutorial, you will learn how to create a meaningful visualisation by combining two axes. We will use the ***Pedestrian Volume.csv*** dataset on Moodle for this activity.

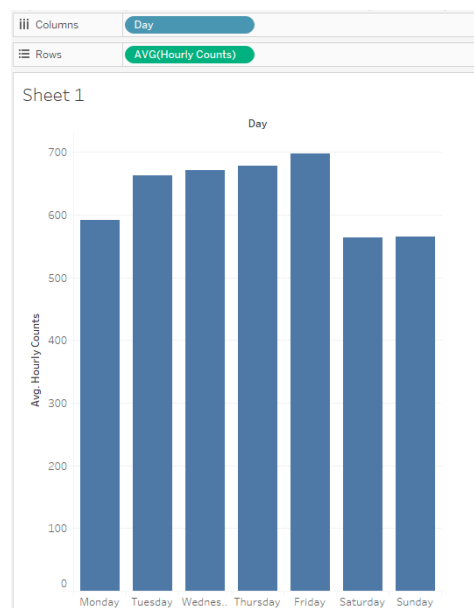
1. Create a new sheet
2. First, we want to create a **bar chart** showing the **average number of pedestrians each day**.

*Don't scroll to the next page. See if you can make it!*

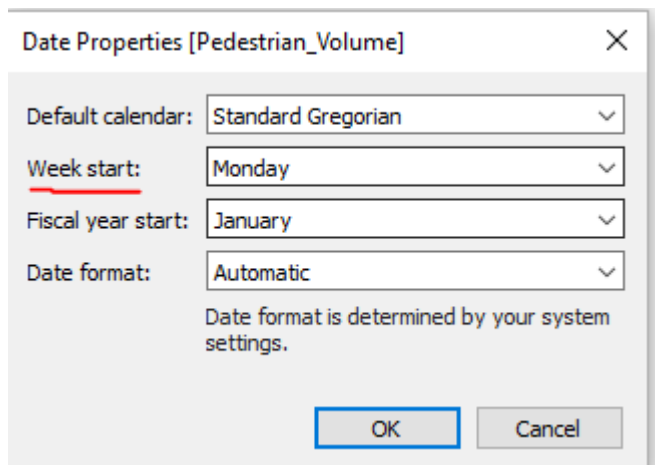
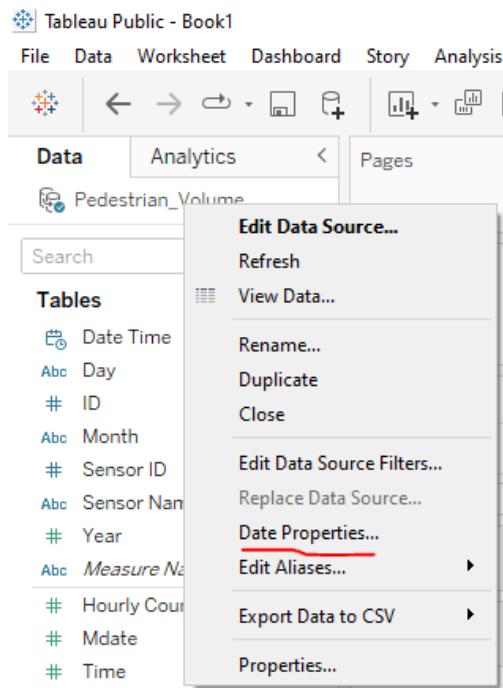
3. So, here is how to do it. Drag and drop the **Hourly Count** measure to Rows. Then, change the measure to **average**.



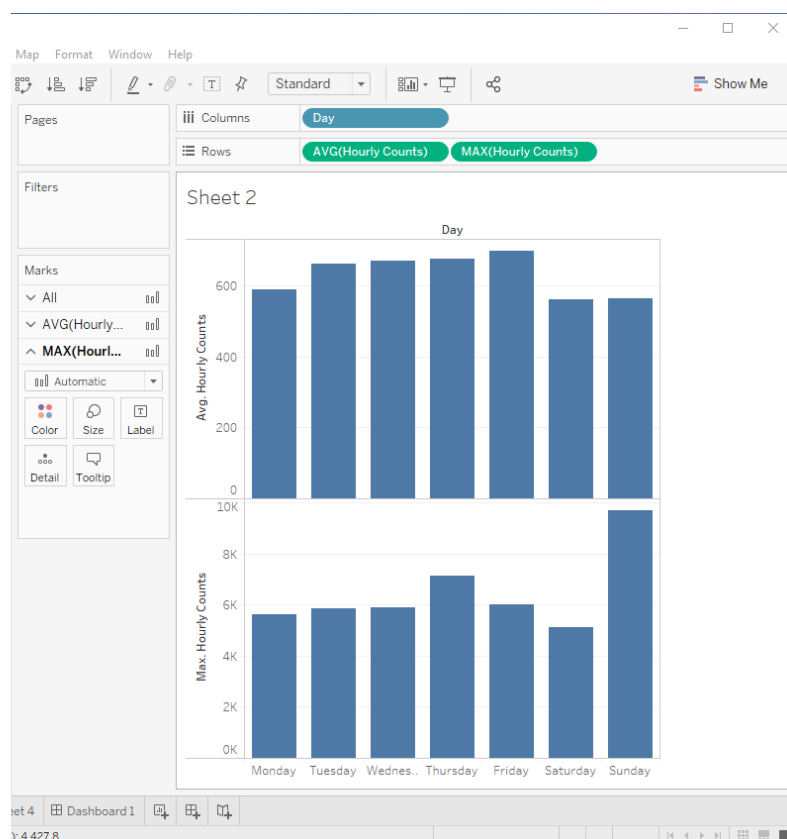
4. Drag and drop the **Day** dimension into Columns. You will immediately get the expected result: a **bar chart** showing the **daily average number of pedestrians**. Please note this is the average number of pedestrians in all sensors.



- a. If you want to change the first day of the week (i.e. Sunday or Monday), you can right-click on the data source in the sheet level tab and select **Date Properties**. Then change the **Week start** option.

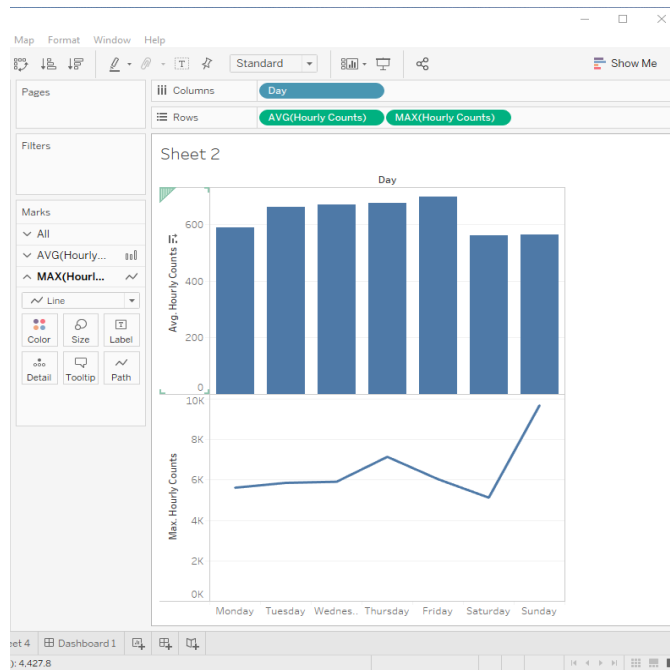


5. Now, plot the maximum number of pedestrians each day to see the difference between the **average** and **maximum** during the peak hours.
6. Drag and drop **Hourly Counts** to Rows and change the measure to **Maximum**.

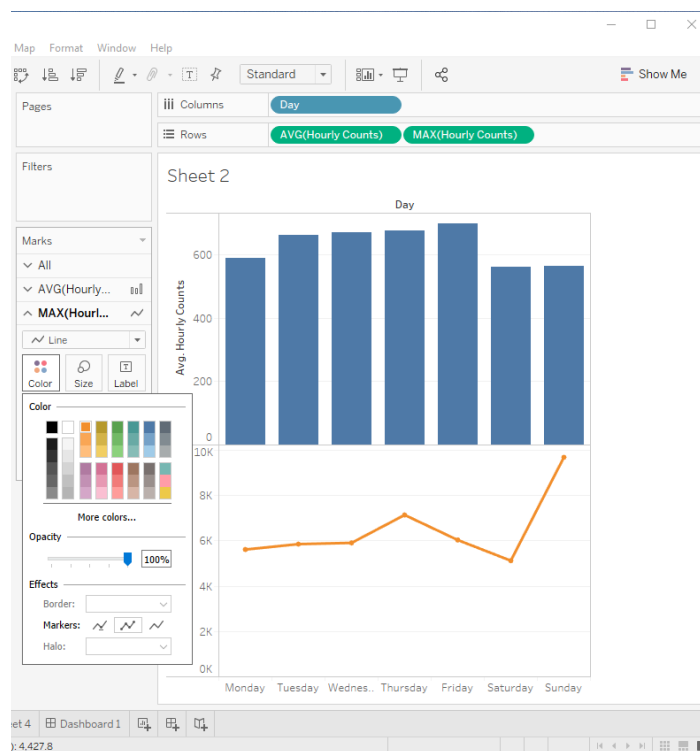


7. Now you have two bar charts with different measures. You can also see there are three sections in the **Marks** panel. This means you can change the mark properties of each bar chart separately.

For instance, you can have a **line chart** for the maximum. Let's do it and change the **Max** mark to the **line**.

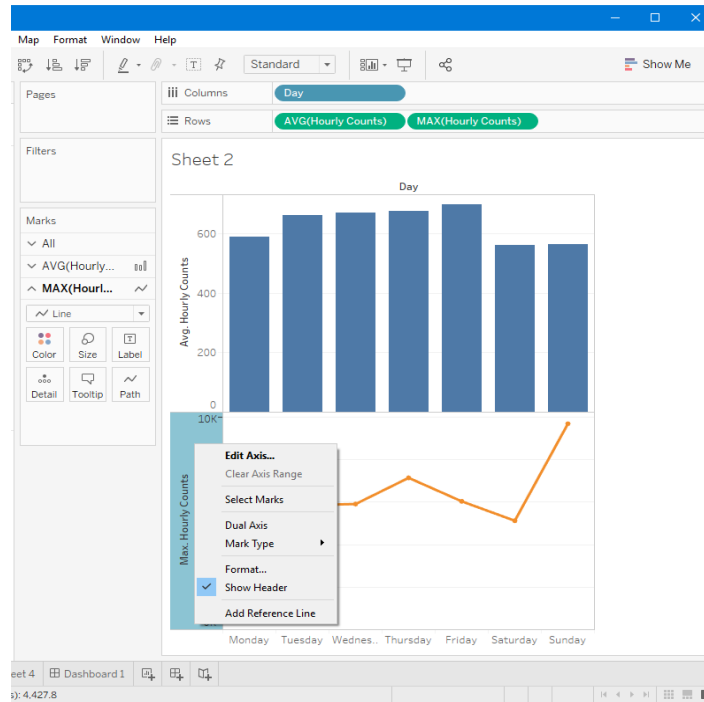


8. You could also change the **colour** of the line.

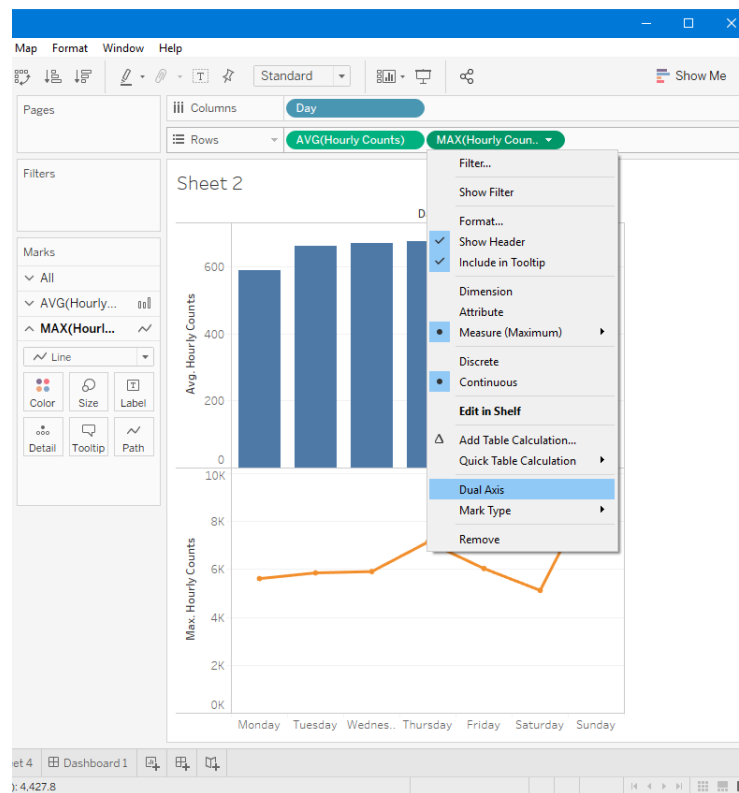


9. That's looking good. Now, recall the **"least ink" principle**. You would want to minimise the **amount of ink** used in your visualisation and maximise the **amount of information**. In this case, you can see that both charts share a common variable: Hourly Counts. It obviously makes sense to combine them into a single visualisation with a **shared axis**.

10. In Tableau, we can do it by utilising **dual axis**. First, right-click on **Max. Hourly Counts** axis (the **line chart**). You will see an option called **Dual Axis**.



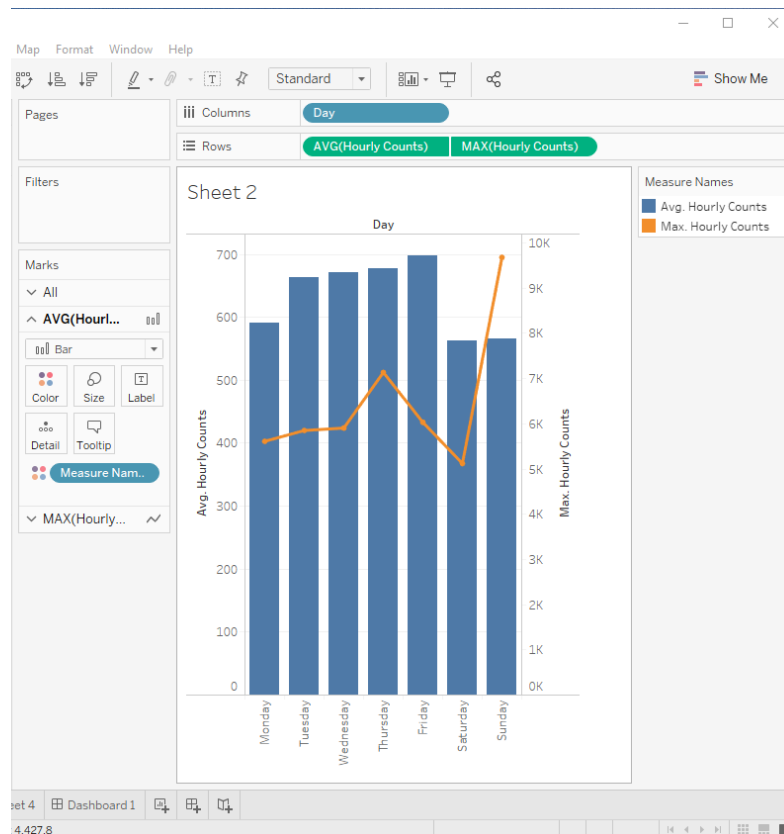
- a. You can also see the dual axis option by clicking the **Max(Hourly Counts)** in the Rows.



11. Once you've clicked on the **Dual Axis**, you will have a **composite chart** showing both the **Average** and the **Maximum** number of pedestrians each day. You will also notice that the **bar chart has turned into a dot chart**.

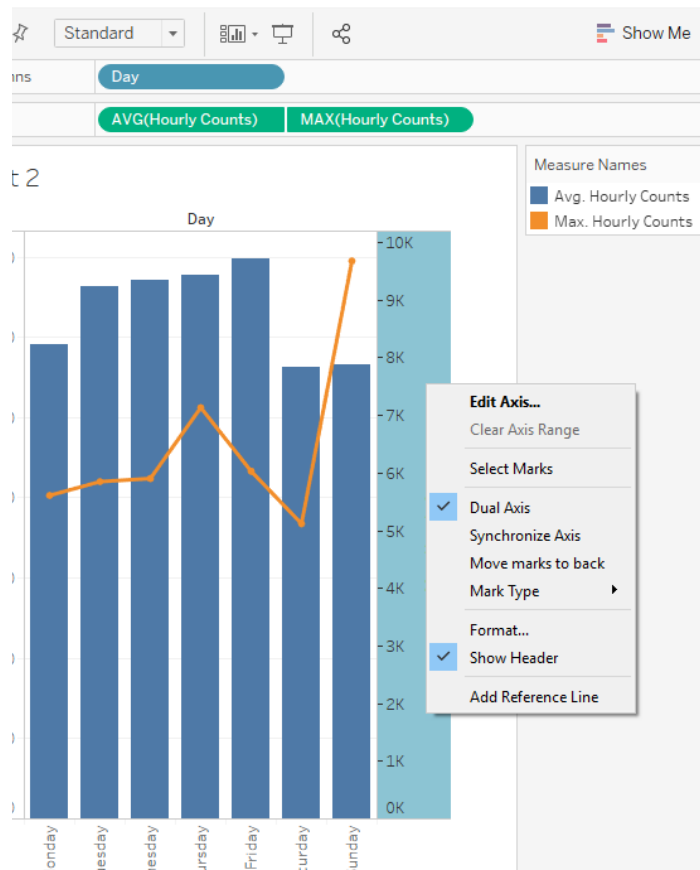
*Why do you think Tableau changed the bar chart to a dot chart?*

12. Let's revert to the bar chart. Change the **AVG(Hourly Counts)** mark to **bar**.

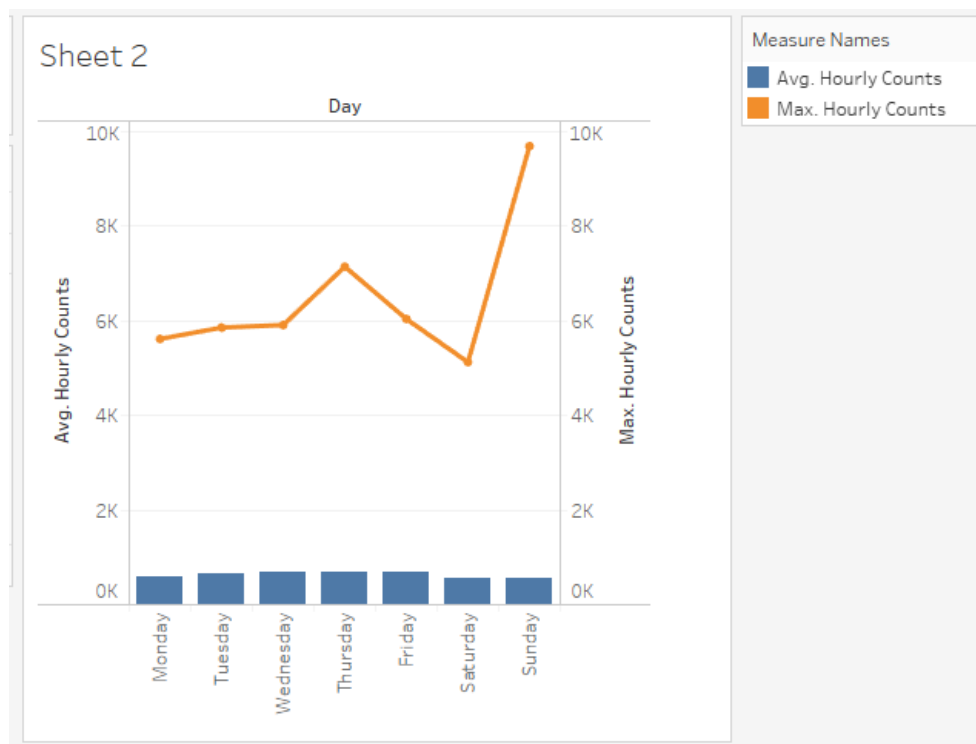


13. Nicely done! We now have a **composite chart**. But wait a minute, don't you see any problem with this chart?

*Before proceeding, discuss the problem with your peers and think of ideas on how to fix it!*



14. If you find that the problem is **the maximum values being below the average values**, you are right. You can tell the difference from the marks used, but this is not a good way of visualising it. You might want to **synchronise the axis** and have a **single shared axis**. To do this, right-click on the axis, and click **Synchronise Axis**.



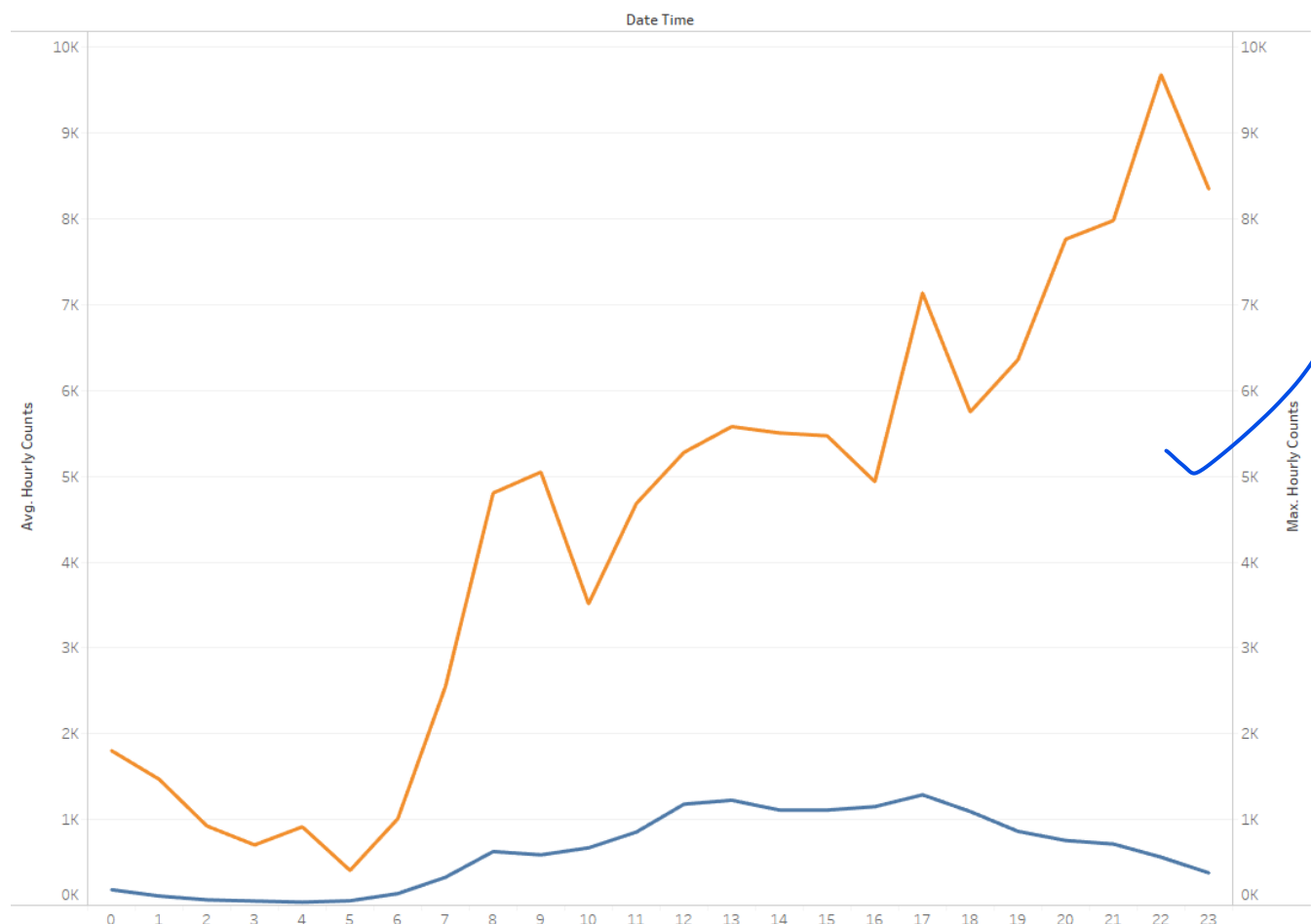
15. Now, our visualisation is not lying. Remember, it is important to **synchronise** the axis when you have **multiple measures sharing a common axis** (in this case, they are sharing the Day axis). This example maybe not be the ideal one since it is very hard to see differences in Avg. Hourly Counts. Try to think about it if you decide to use dual axis in your visualisation project.



## 2. Tableau: Dual Axis and Simple Label Exercise

In this activity, you need to apply the skills you have learned from the previous activity to create a similar visualisation (with average and maximum) using the **Hour** dimension. It will be used later to see the distribution of the number of pedestrians among different hours within a day.

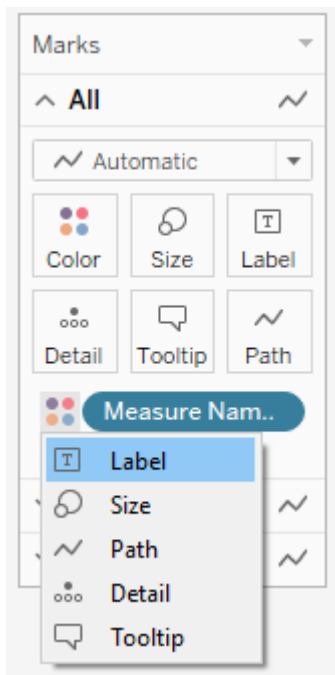
Create a new sheet and go ahead. Your visualisation should look like this:



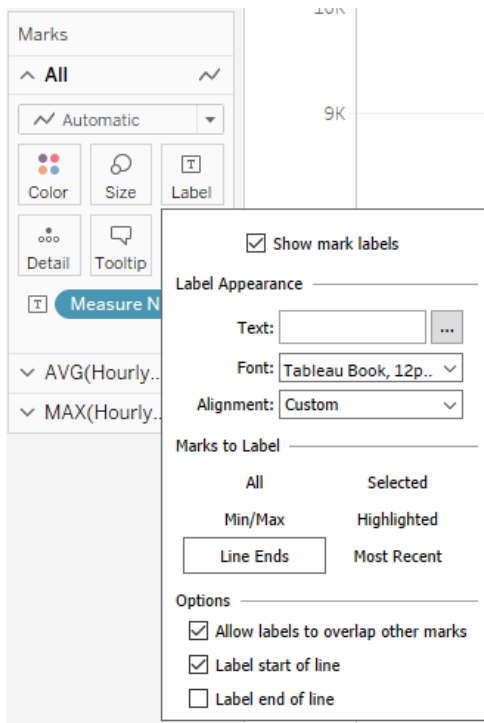
Note that the x-axis contains the **Hours** dimension while the y-axis illustrates both the **average** and the **maximum** number of pedestrians per hour. The hour dimension can be derived from the **Date Time** dimension. ✓

As a final touch, let's **reduce the use of colour** in this visualisation by using Label instead of Colour.

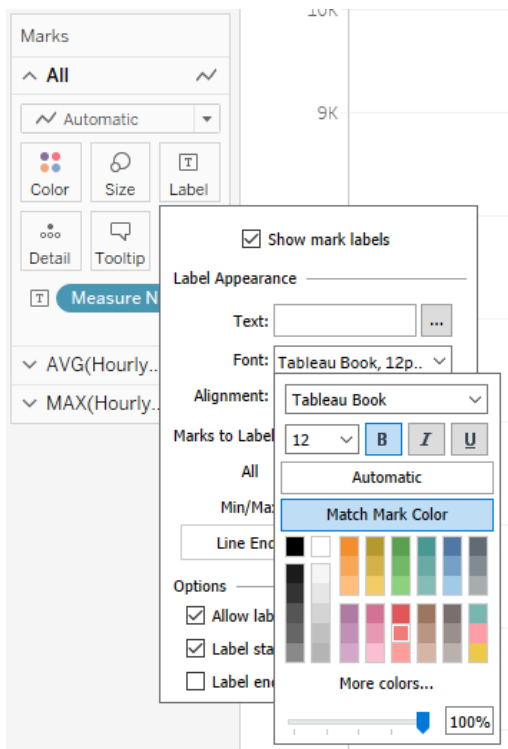
1. First, change **the Measure Names** of **All** marks from **Color** to **Label**.



2. Then click the **Label** icon to show label options. Check **Show mark labels**. Set **Marks to Label** option to **Line Ends**. Most of us read from left to right, so it might be a good idea only to check the **Label start of line** option to increase the data-ink ratio.



3. We could also increase the font size and weight as well as match the font colour to the line colour. Click **Font** drop-down menu to adjust those options.



4. Your final line chart should look like this.

