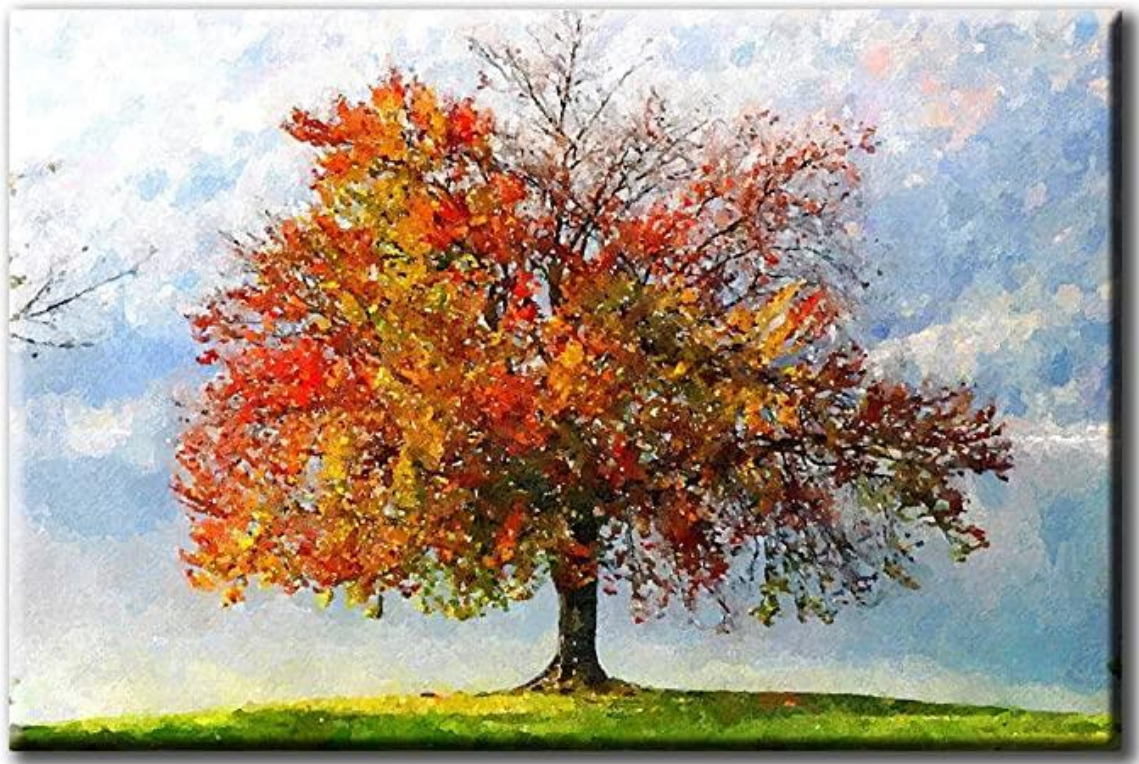


DR. ALVIN'S PUBLICATIONS

LEARNING TABLEAU PART III STORYTELLING

BY DR. ALVIN ANG



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I. HOW TO APPROACH DIFFERENT AUDIENCES

A. C-LEVEL EXECUTIVES

- Most are not familiar with Tableau.
- Make it VERY SIMPLE for them.

B. FELLOW ANALYSTS OR PEERS

- They might have Tableau experience.
- You can give them more interactivity, allowing them to discover insights on their own.
- Use more parameters, filters, and/or dashboard actions to let them ask their own questions of the data.

C. ANALYTICAL TYPE

- They demand details.
- They want trend lines, forecasts, clustering.
- They want to see raw data to trust the data.
- They demand full understanding of the situation clearly

D. COMPETITIVE

- They have strong opinions and want to know how to get themselves ahead.
- You should be succinct, direct, and focus on the facts so they can efficiently decide a course of action.

E. AMIABLE TYPE

- They are easy-going and respectful.
- They want trust and relationships.
- They trust the visualizations you've developed if they trust you personally.
- Try to connect with them by acknowledging their shared ownership in projects, asking them questions, and listening to what they value.

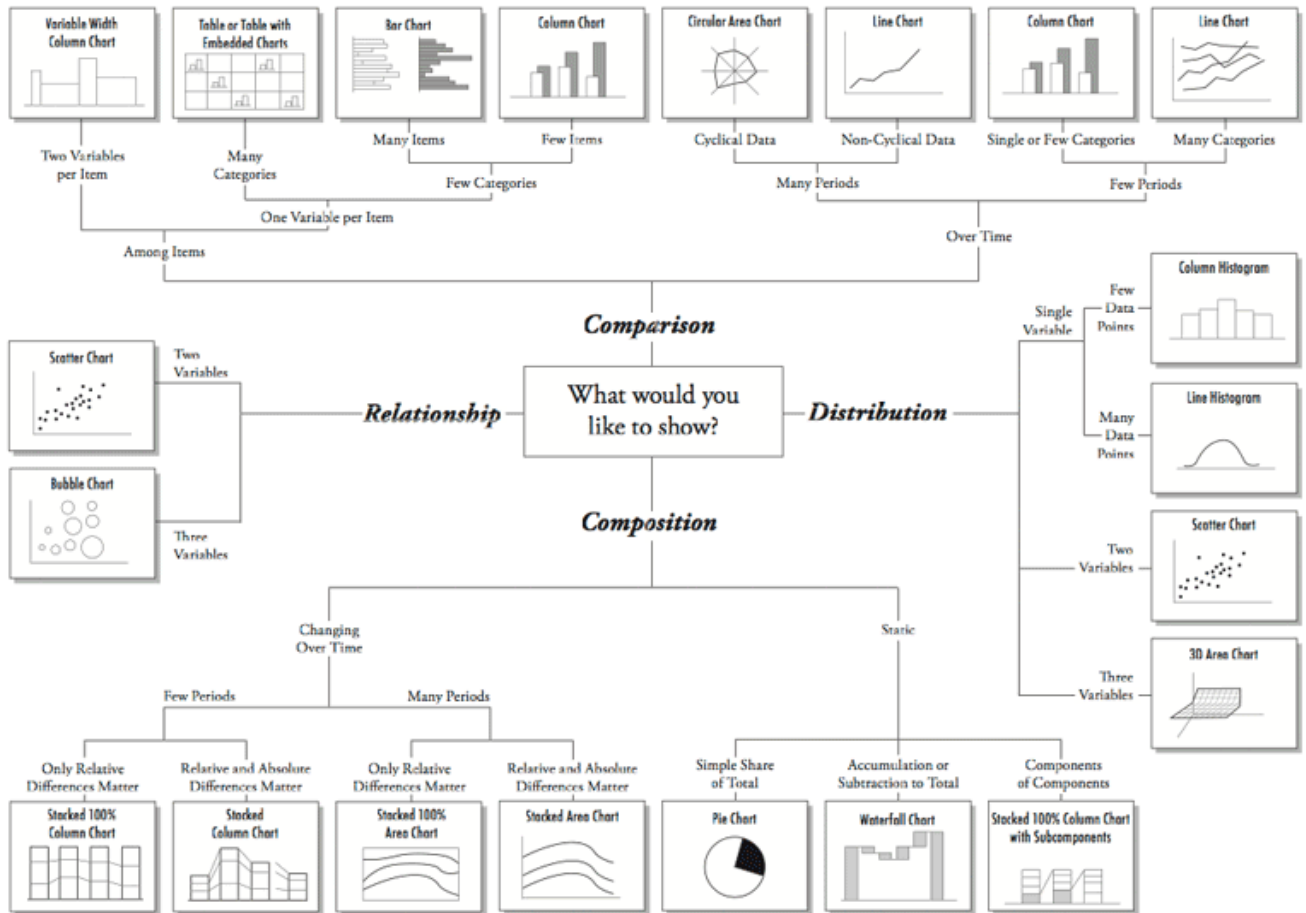
F. EXPRESSIVE TYPE

- Expressive audiences are more free-spirited than the analytical or amiable type.
- They often lean more towards the creative side and trust their gut over data
- The best approach with this group is to focus on storytelling.

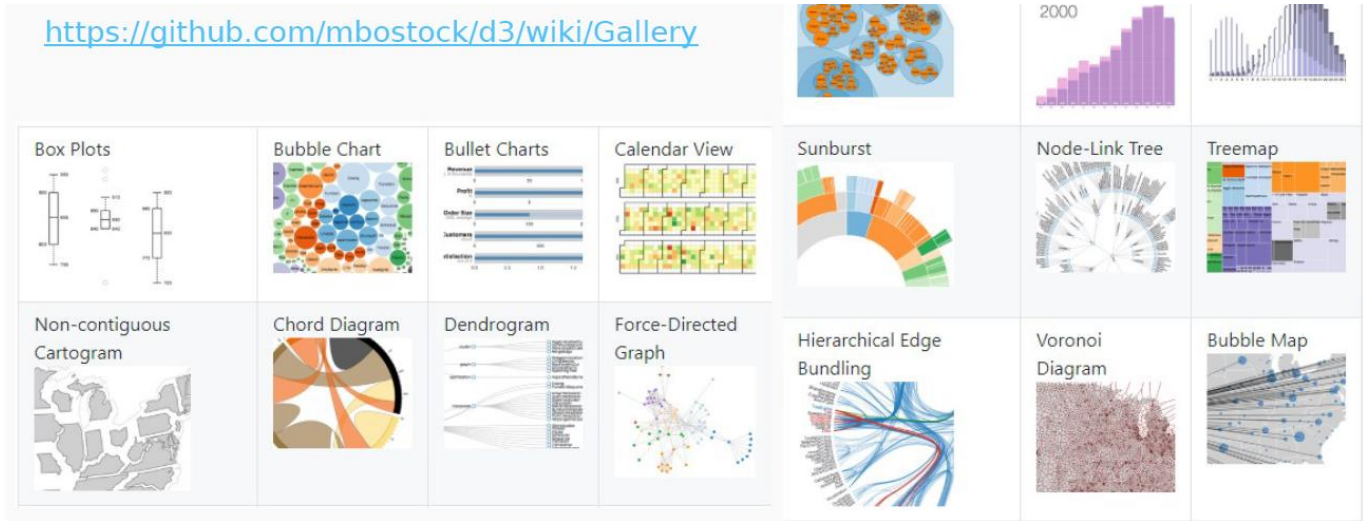
II. CHARTING BEST PRACTICES

A. CHART SUGGESTIONS

Chart Suggestions—A Thought-Starter



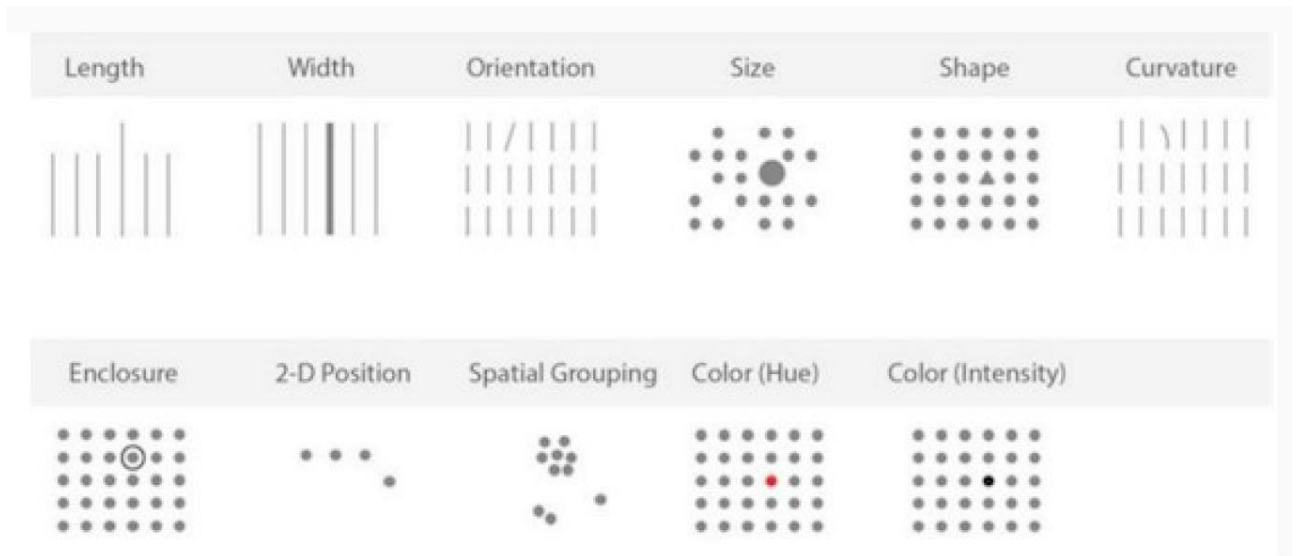
B. MANY DIFFERENT CHART TYPES



<https://github.com/d3/d3/wiki/gallery>

<https://informationisbeautiful.net/>

C. TAKE NOTE OF THE FOLLOWING WHEN CHARTING....

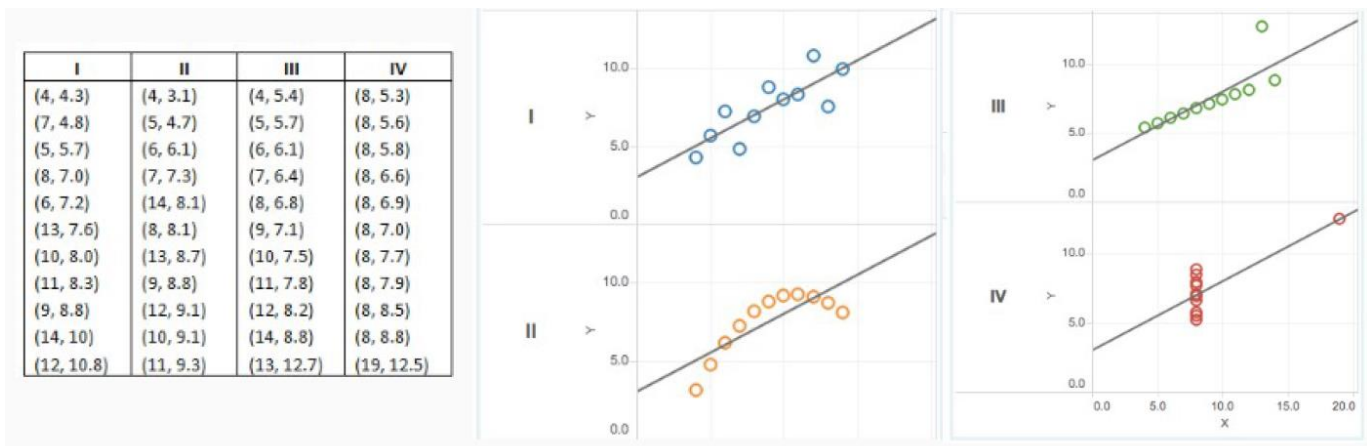


D. ANSCOMBE'S QUARTET

- Statistically, do all the numbers look the same to you?
- You might be fooled that all their graphs will look the same (based on their statistics)...

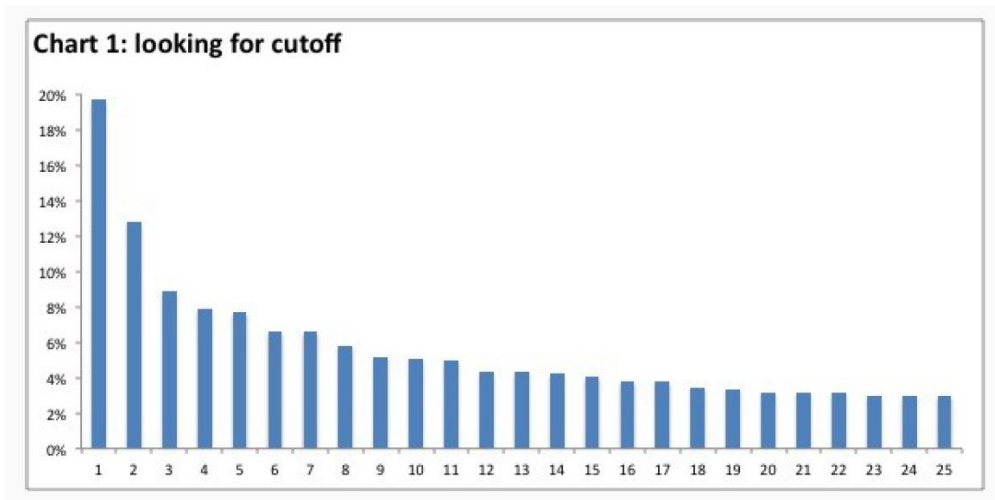
Plot	sum X	sum Y	avg X	avg Y	stdev X	stdev Y
I	99.0	82.5	9.00	7.50	3.32	2.03
II	99.0	82.5	9.00	7.50	3.32	2.03
III	99.0	82.5	9.00	7.50	3.32	2.03
IV	99.0	82.5	9.00	7.50	3.32	2.03

- Anscombe did this to disprove that graphing is useless...
- Because most statisticians prefer to work with numbers rather than charts....
- He proved his point that graphing is needed and you can't trust your numbers all the time....



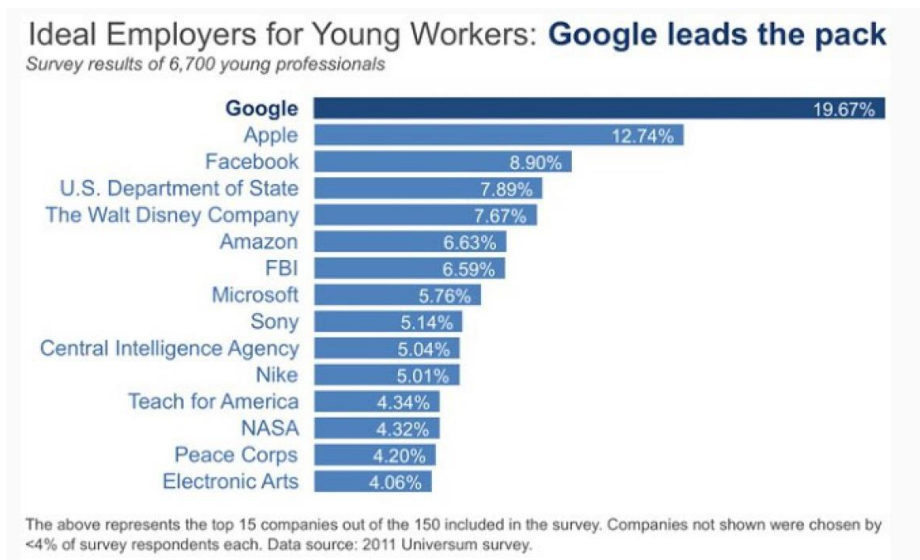
E. USING BAR CHARTS

Don't do this... it's a very bad chart... no details, thin bars, unknown axes.... No context...etc...

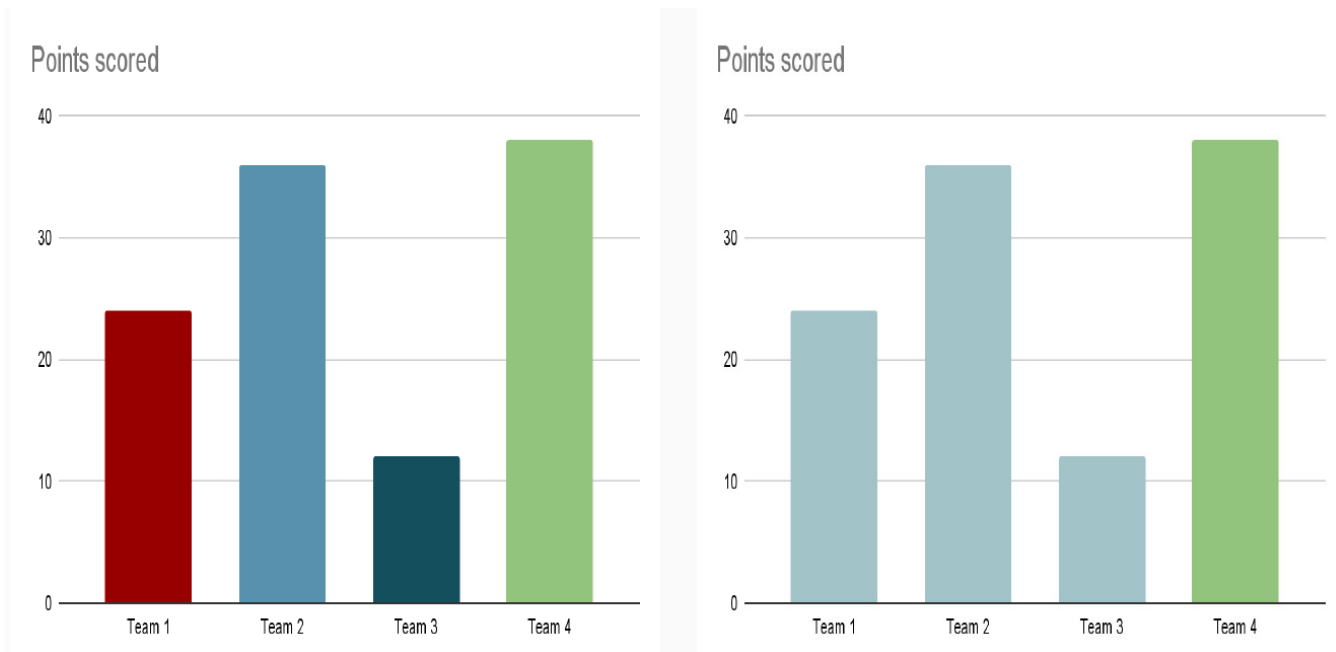


Do this instead.....

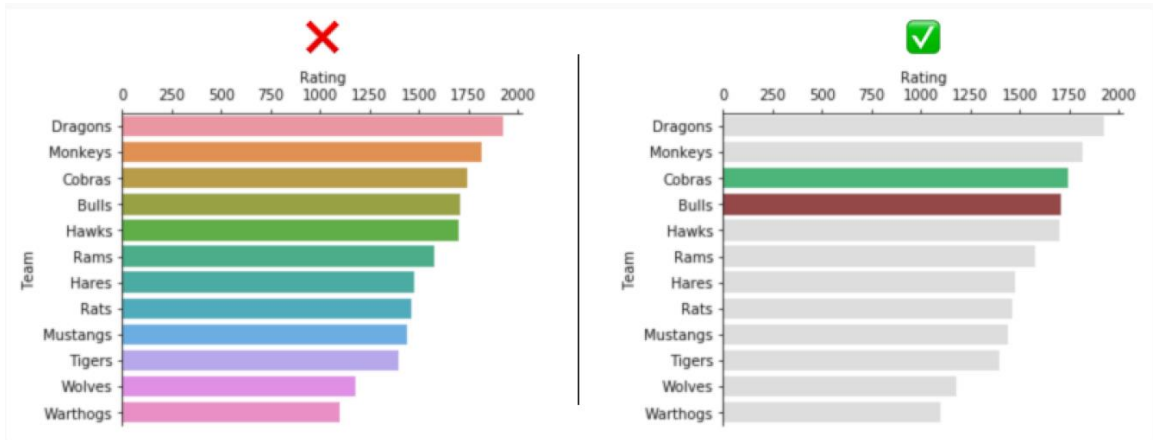
- Ample description / simple and easy to understand
- Big font words at the top, gradually progressing to smaller fonts as it goes down



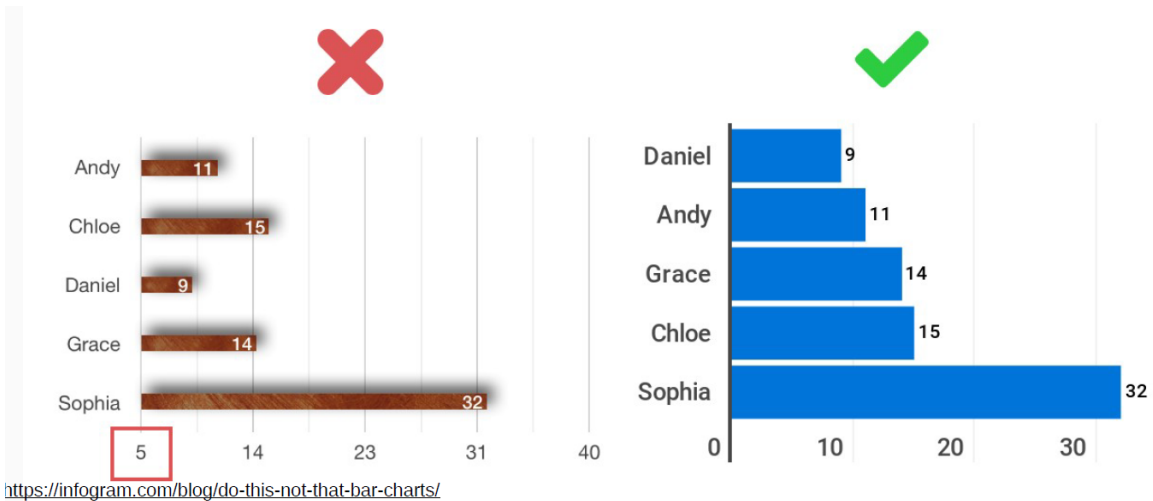
- Compare the Left bar chart to the one on the Right... there's no right or wrong answer....
- The one on the Left appears to be colour coded to the Team's colour themes
- The one on the Right is trying to draw attention to the green bar on the most Right (showing that its the highest)....However, the colour toning is wrong (all colours are too light)....
- In other words, it doesn't achieve its effect.
- Go to <https://colors.co/> to find the appropriate colour toning.



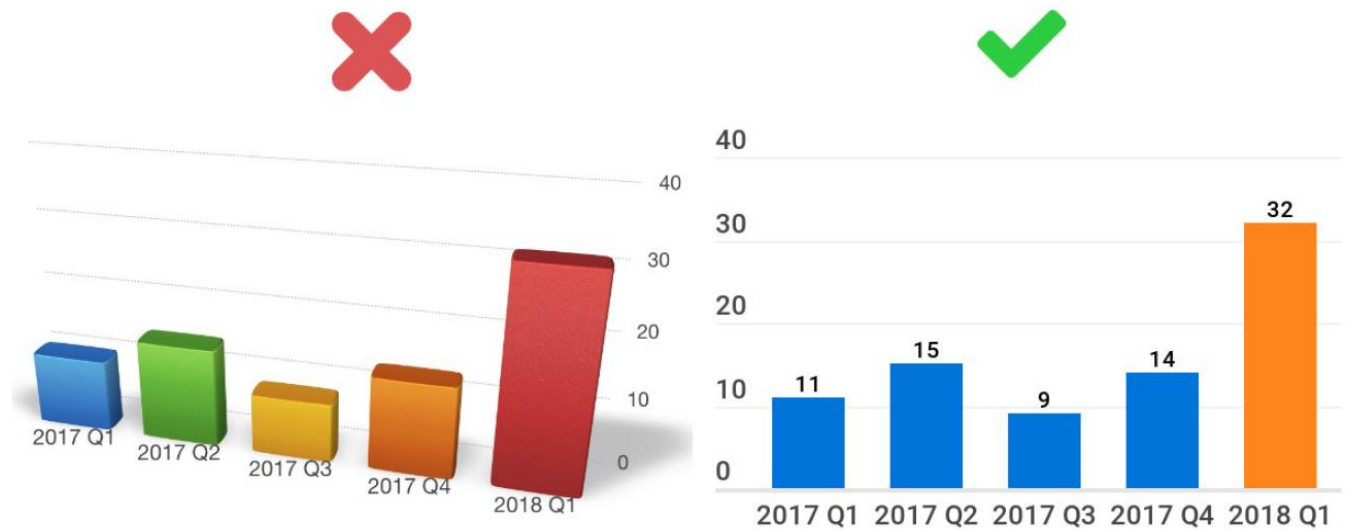
- The Left chart is bad, the Right chart is good.
- Left chart is too colourful (the colours don't serve purpose).
- Right chart highlights the teams to be compared.



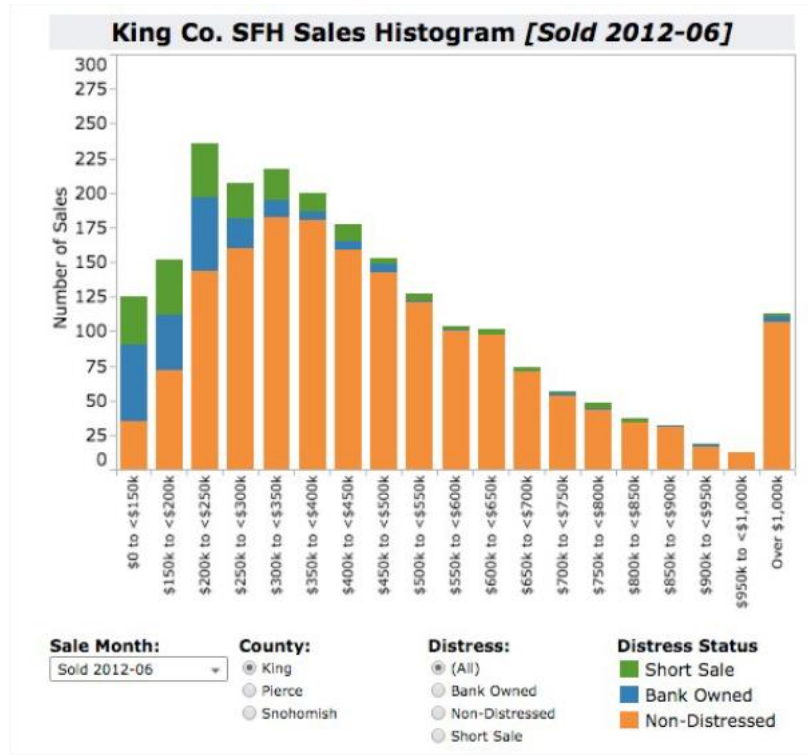
- Left chart is bad, Right chart is good.
- Left chart has shadows + doesn't start at 0 + not in proper order + bars too thin



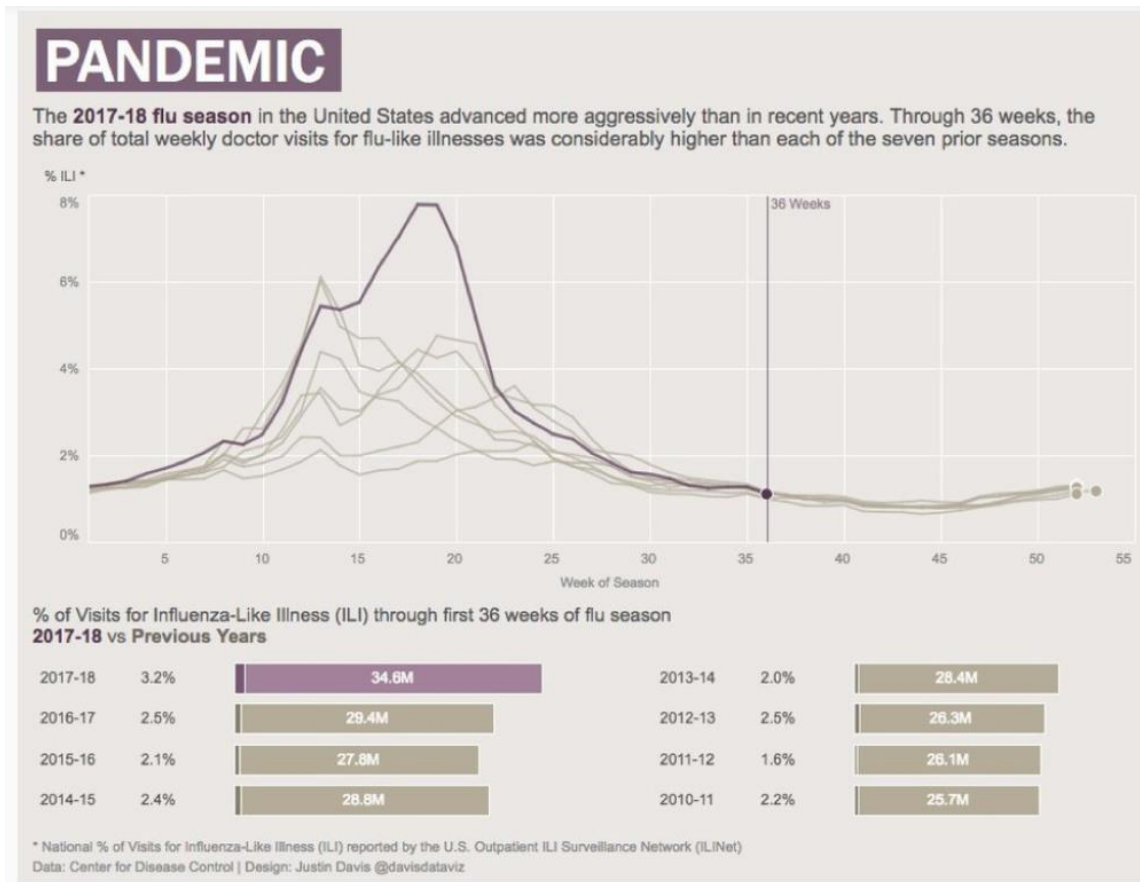
- Left chart is bad / Right chart is good.
- 3D distorts that view and viewer can't align Q1 vs Q3 properly
- Shadows cause distortion.
- Right chart last bar is highlighted orange to display greatest height.
- Left chart too colourful and colours don't serve purpose.



- What is the histogram below trying to say?
- It's a stacked bar histogram.
- As the bins increase (income range expands), you notice that the green and blue bars disappear.
- This shows that as people get richer, the properties they own ad “non-distressed” sales.
- The lower income range have the most distressed sales (particularly bank owned).

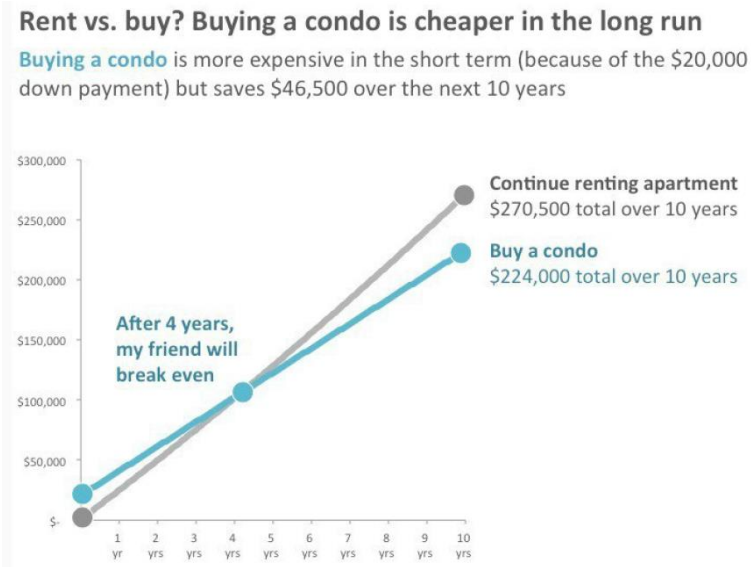


F. USING LINE CHARTS

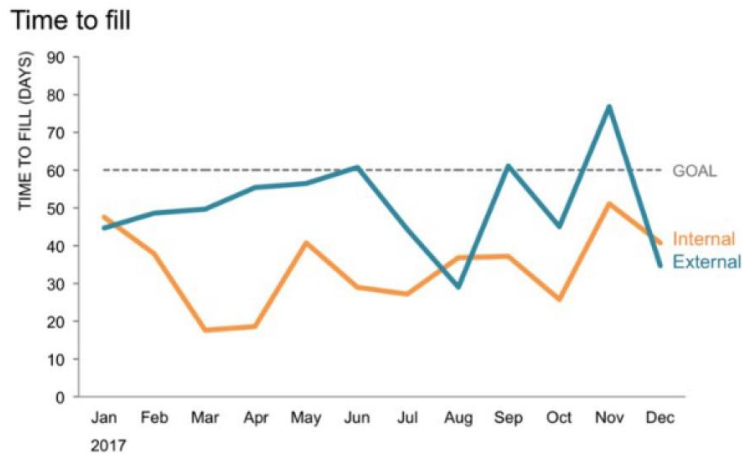


- Above is a good line chart.
- Proper use of colour: Purple highlights the peak year (2017 – 2018) and corresponds to the 34.6M.
- The rest are unimportant; thus they are coloured brown altogether.
- The line drawn at 36 weeks show that pandemic all ends there.

1. CHOOSE PROPER CONTRAST IF COMPARING LINES

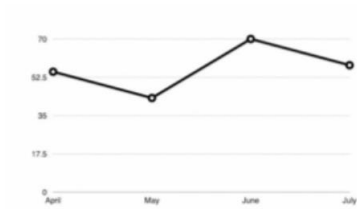


- Above is a good line chart.
- The highlighted blue line overpowers the grey line suggesting people to buy rather than rent.
- The word “Buying a Condo” is highlighted in blue that corresponds to the blue line.



- Above shows a simple good line chart.

Contrast



60

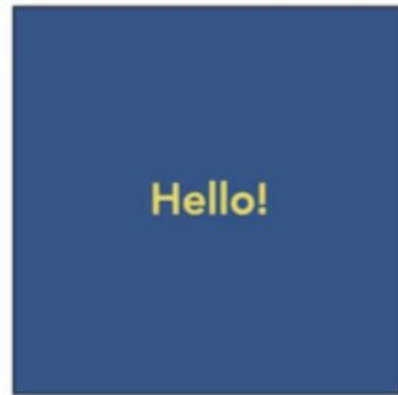
Choose appropriate contrast.... Black vs White line.. the White line disappeared!

Rather, use a Purple vs Yellow contrast.. both lines will be shown....

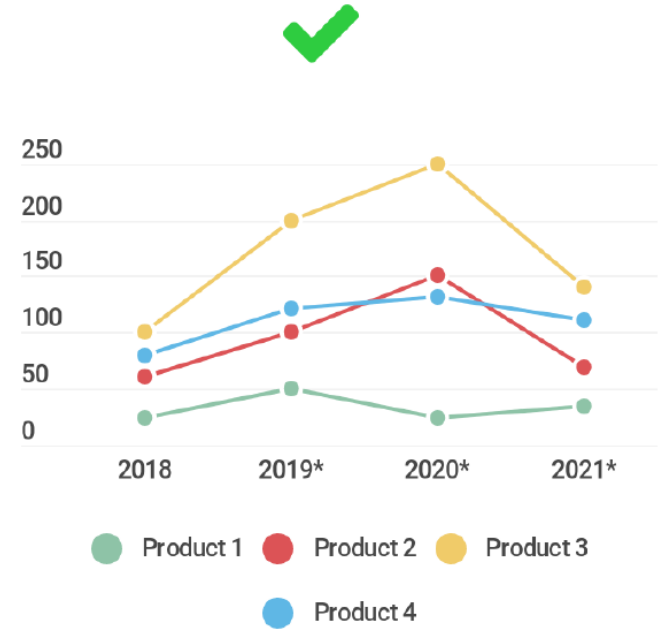
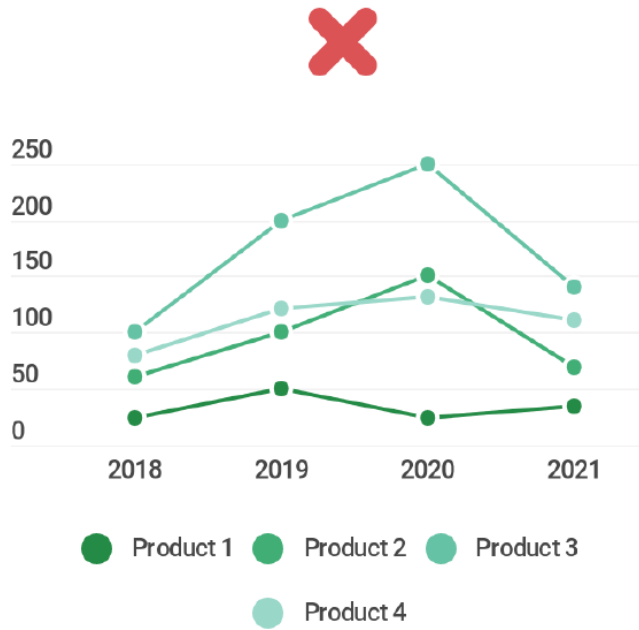
Poor Contrast



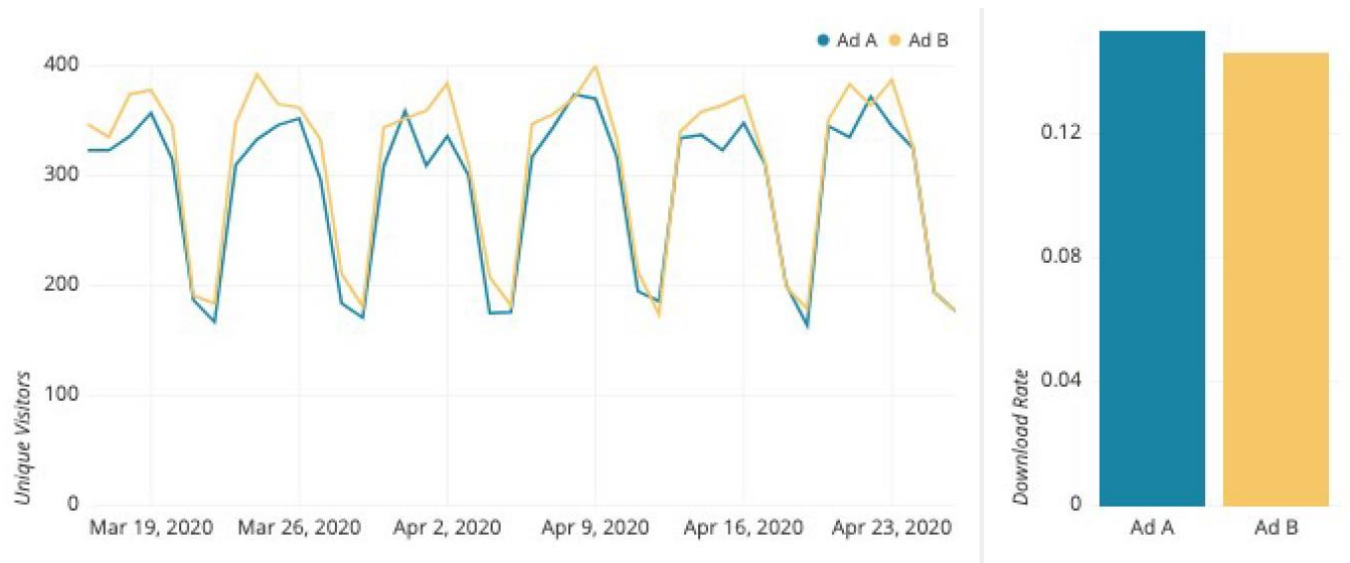
Good Contrast



61

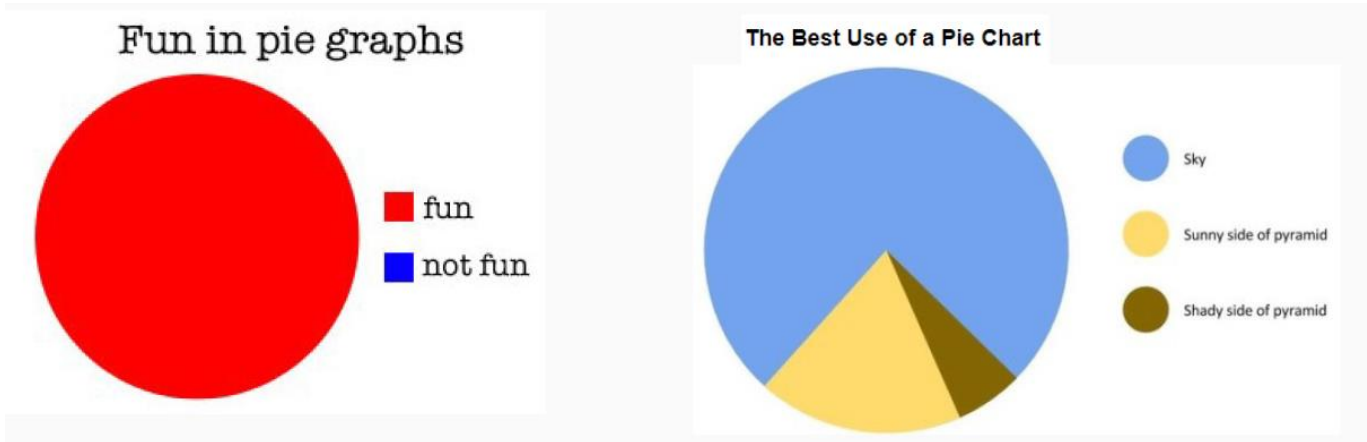


- The colour tone of the left chart is wrong.
- The dark green line should be placed at the top while the light coloured one should be placed at the bottom.
- The right chart is better because different colours represent different products.

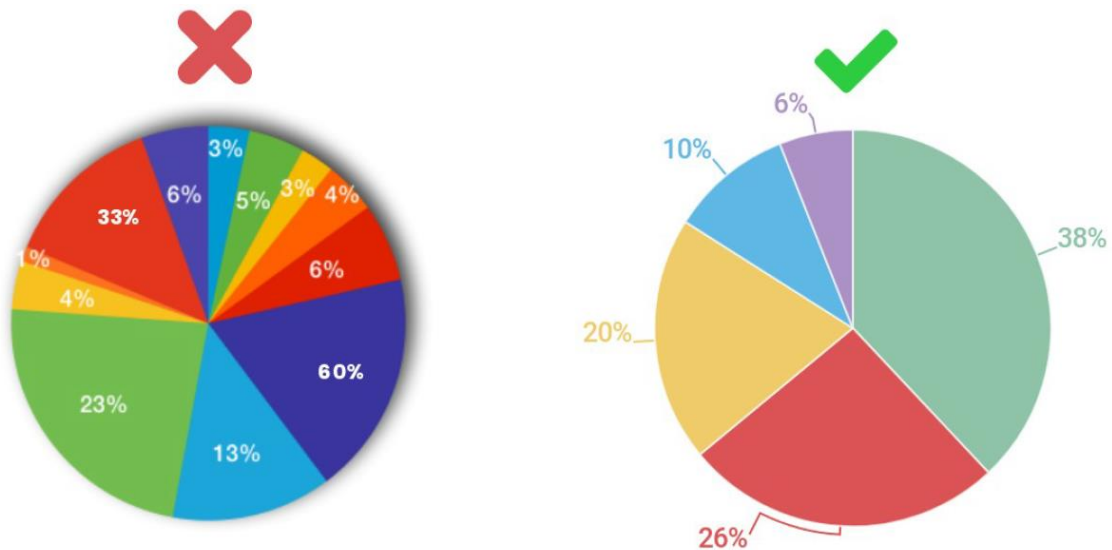


- The purpose of the line chart used together with the bar chart above is to show:
 - There's a greater traffic visiting Ad B than A
 - But surprisingly, many people still prefer to download Ad A than B.
- The diagram above clearly shows Web Analytics people to have actionable insights.

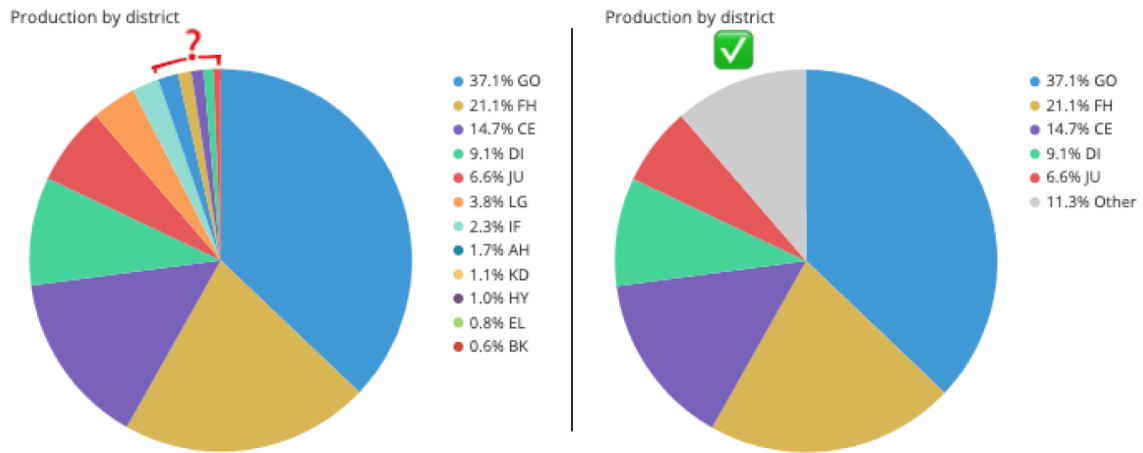
G. USING PIE CHARTS



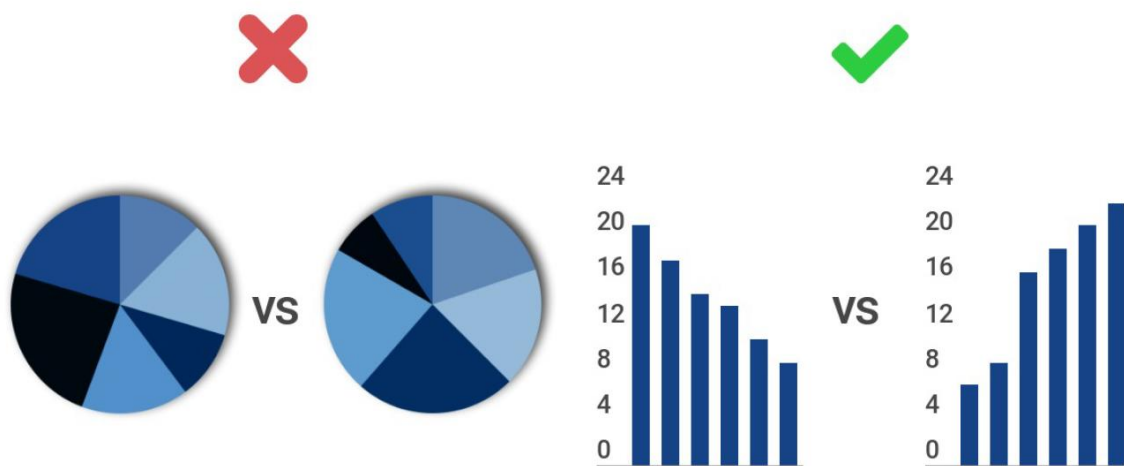
- The Left pie chart is no good because it doesn't help by showing anything that is "not fun".
- Rather, the proper way to do a pie chart is the Right chart.
- Don't have too many categories, showcasing the majority of market share at the top, followed by the 2nd and 3rd at the bottom.



The Left pie chart has too many categories and too many colours. The percentages are hidden within the chart and there's a shadow that distorts the view.

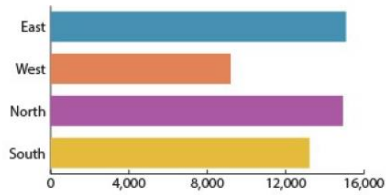


- One way to prevent showing too many categories is to combine them.



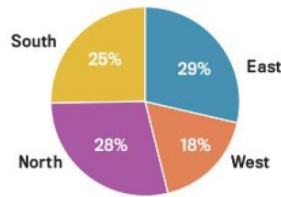
- Don't use a pie chart for comparison. Use a bar chart instead.
- Its difficult to compare two pie charts together.
- Pie charts are meant to display market share. Pie chart in itself is already a comparison.

USE A BAR CHART



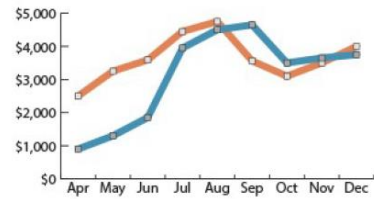
WHEN comparing single or aggregate values (not percentages) between groups or demonstrating comparisons across items (for example, regions, products, or services).
Example: sales revenue by region or department

USE A PIE CHART



WHEN presenting the contribution of multiple groups to a total or the relation of a slice to the whole of the pie.
Example: percentage of total sales revenue by region

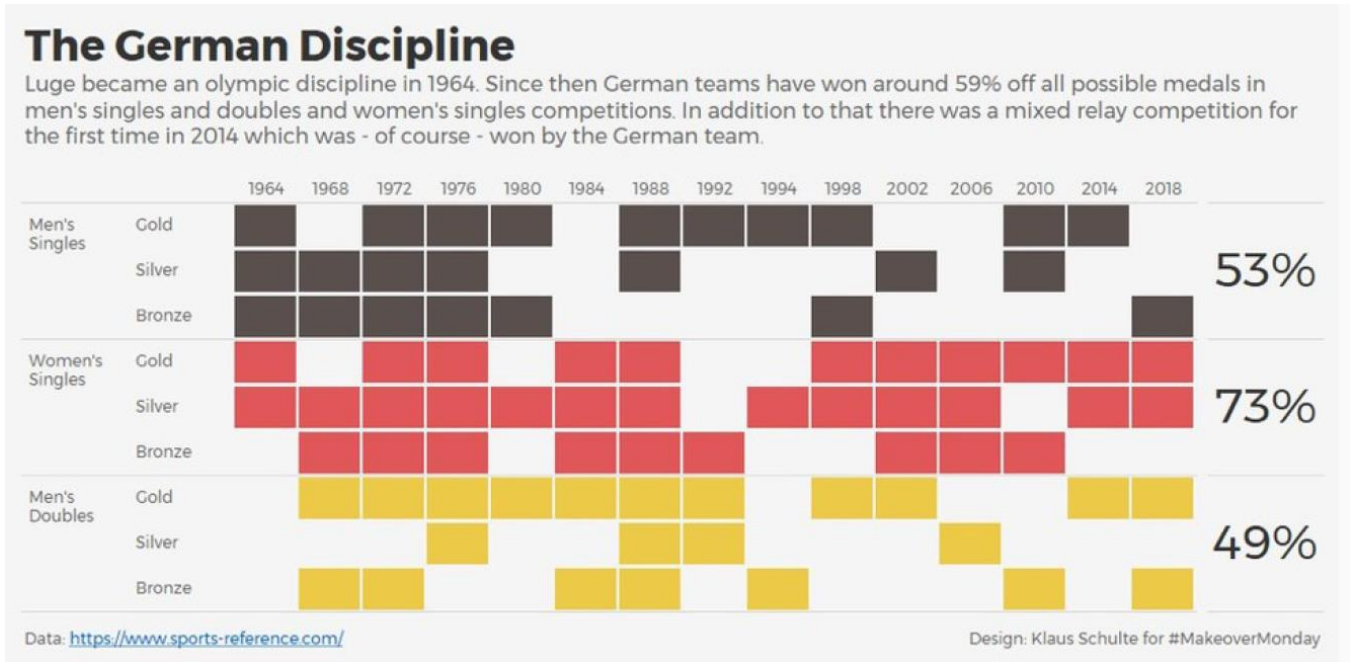
USE A TIME SERIES GRAPH



WHEN comparing a key performance indicator's performance against its target value over time; line charts are often best for comparing series.
Example: direct materials actual cost vs. budget for each quarter

H. USING HEAT MAPS

- Did you notice a German flag in the colours below?
- Notice also that they are trying to tell you that German Women outperform Men.



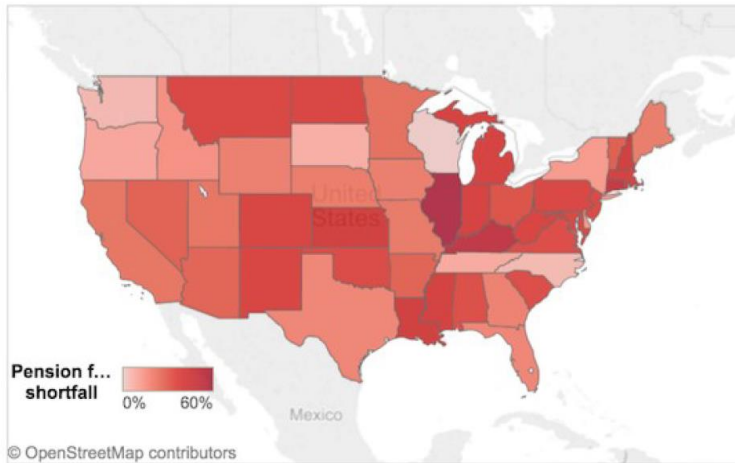
Pensions in Peril

Despite recent stock market gains, states continue to shortchange their pension plans, leaving many of them badly underfunded. (SOURCE: Pew Charitable Trusts)



(Dropdown for AK, HI)

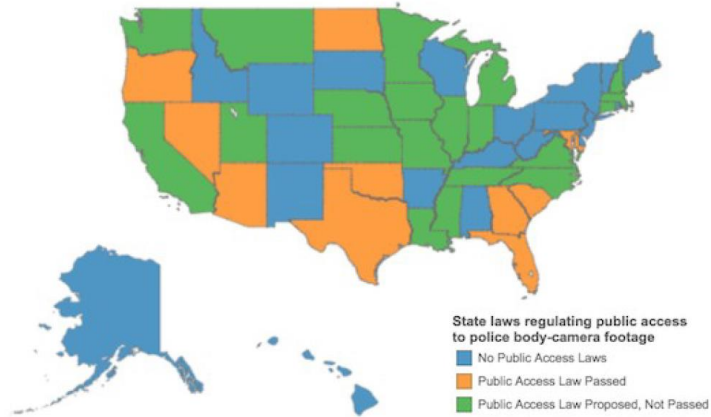
Contiguous US



- Heat map may not only be used to show density.
- It can also be used to categorize different states.

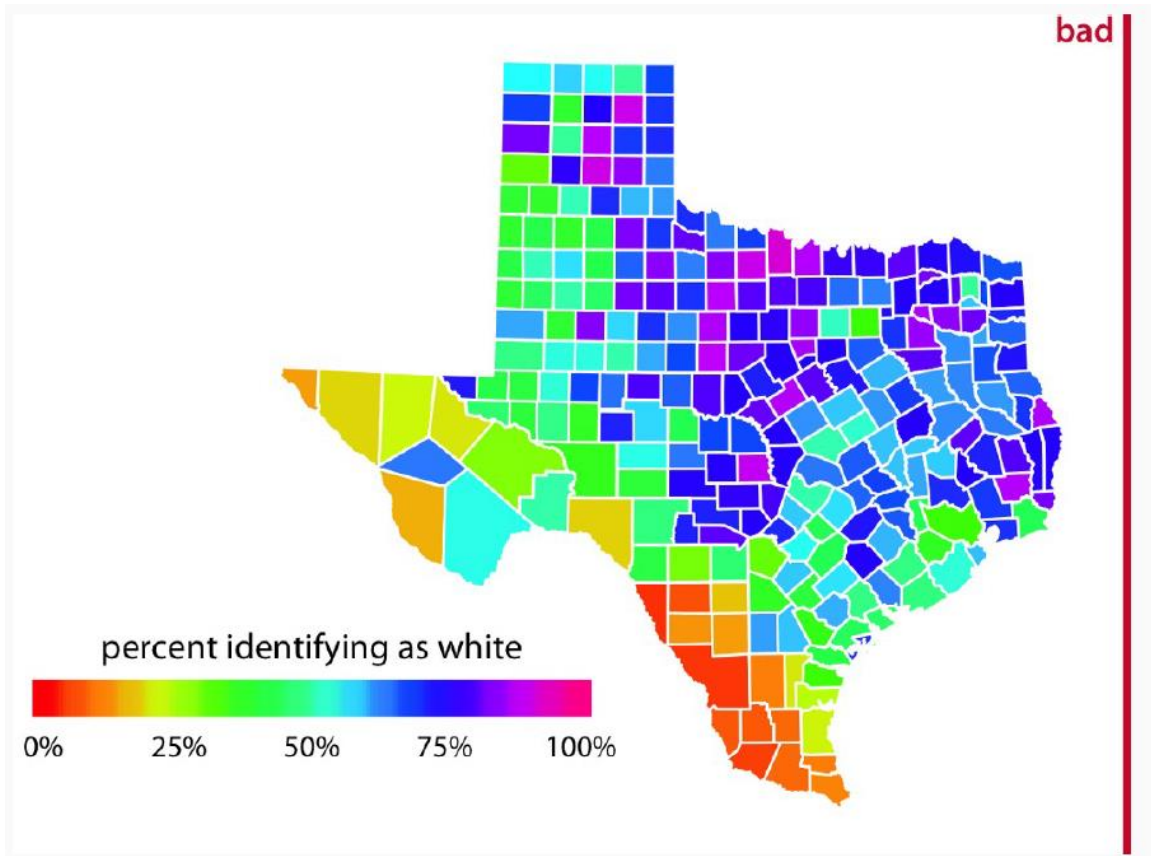
Body Camera Laws

Ten states have passed laws that control the public's access to footage from police body cameras. Hover over each state for more information.

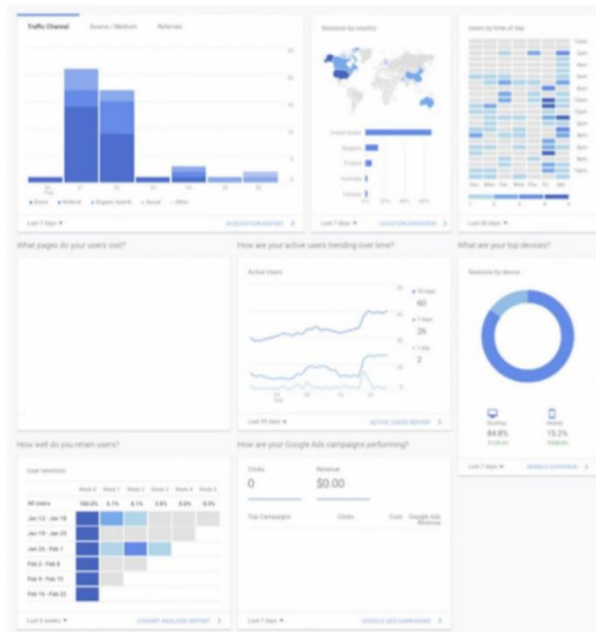
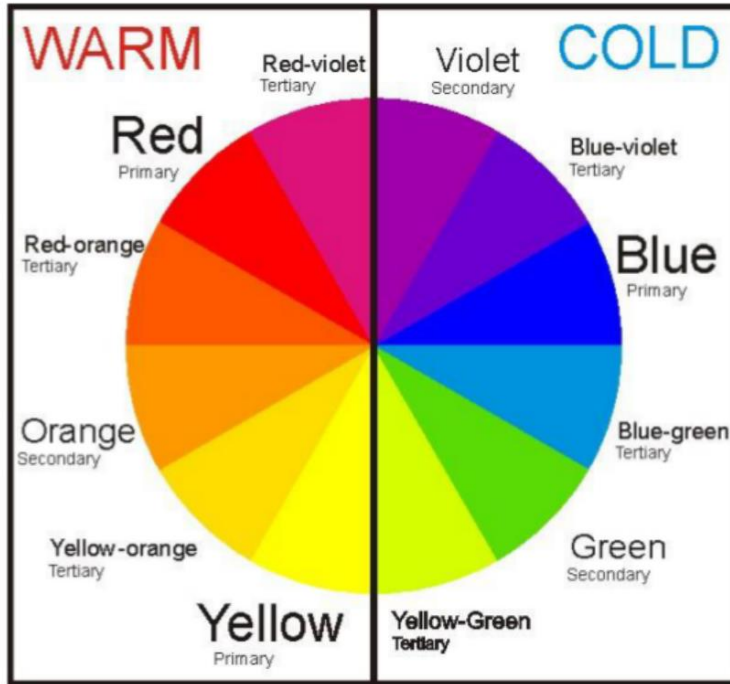


Source: Reporters Committee for Freedom of the Press

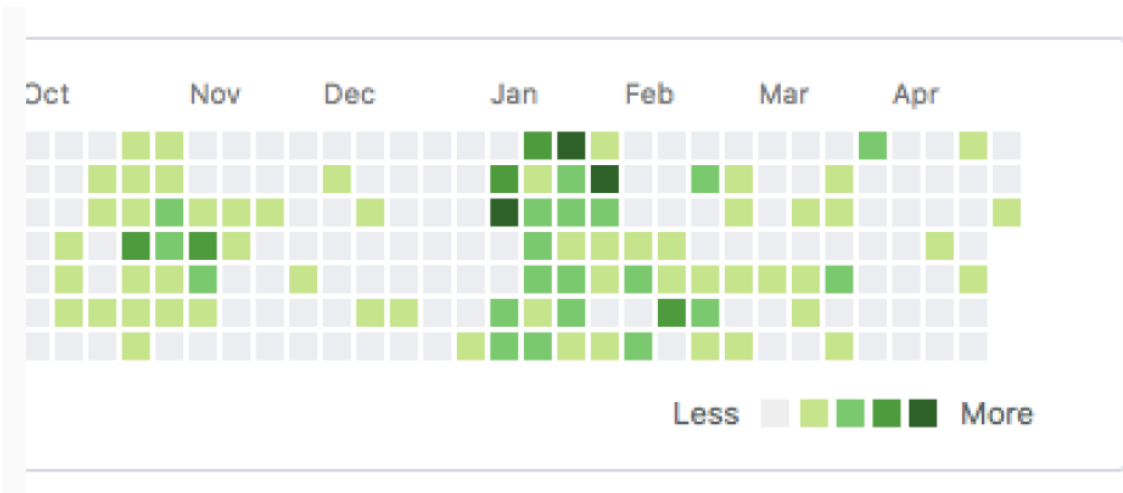
<https://colorbrewer2.org/>



- This is a very very bad heatmap
- It doesn't show anything.
- 0% is red and so is 100%.
- Too colourful distorts viewing and no purpose.

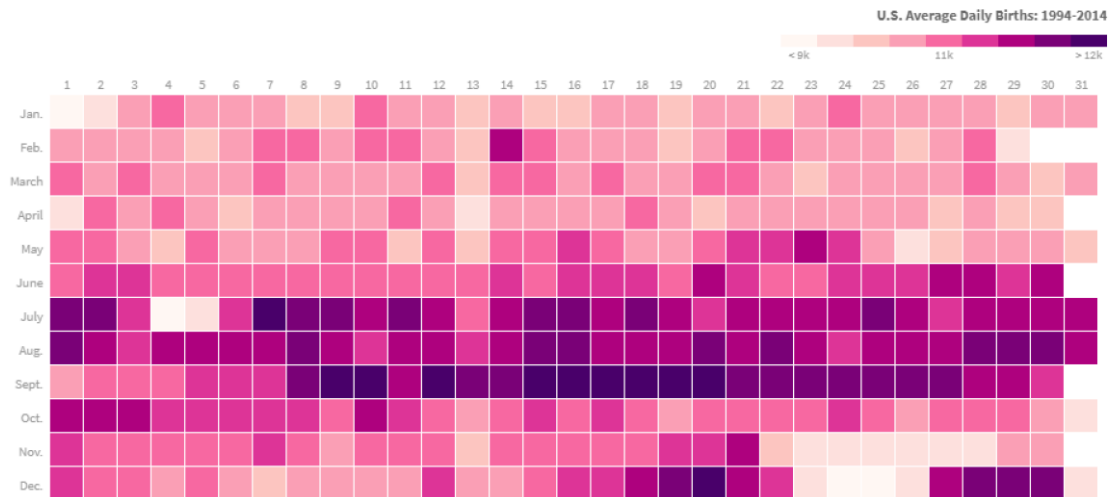


Progress is indicated by using light to dark colors.



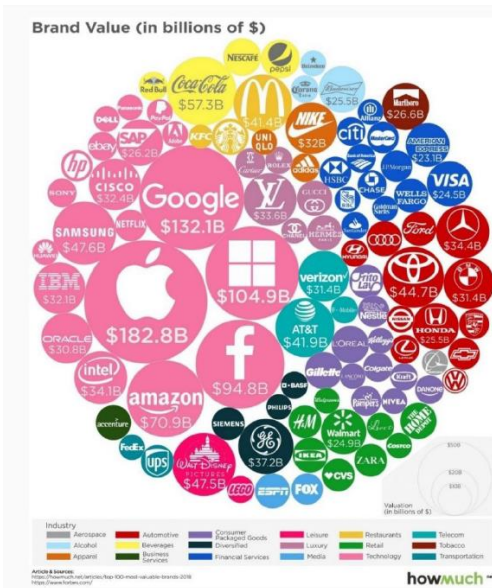
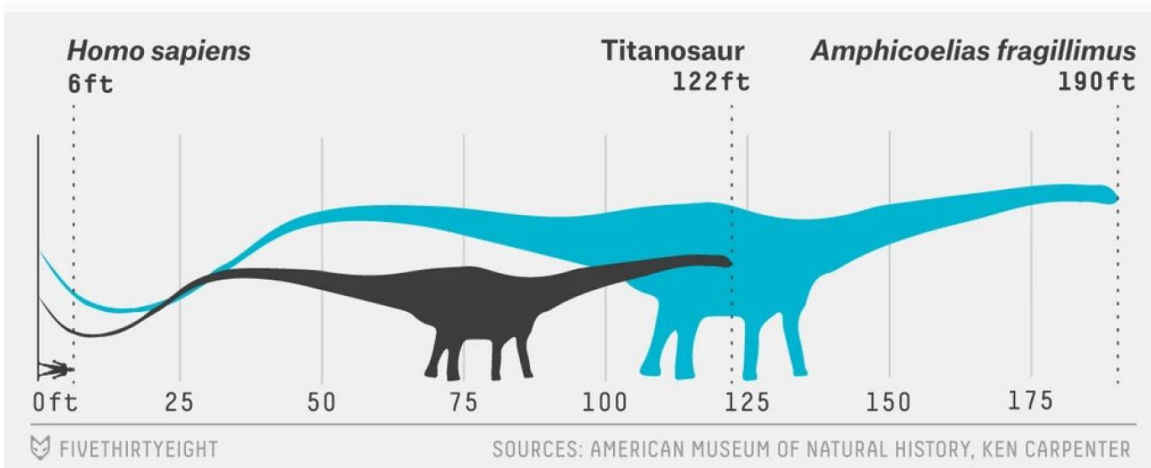
HOW POPULAR IS YOUR BIRTHDAY?

Two decades of American birthdays, averaged by month and day.



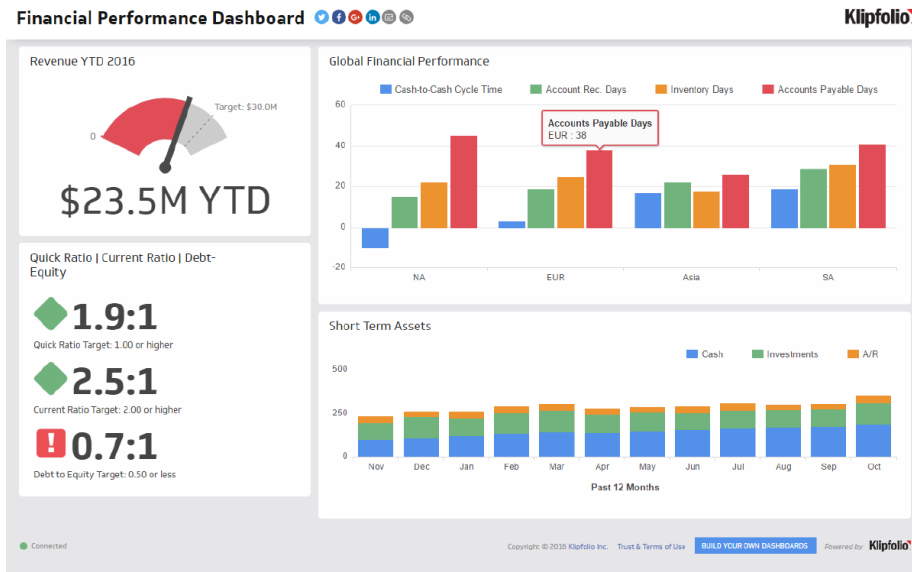
- Above diagrams show us some good examples of using heatmaps.

I. COMPARATIVE CHARTS



III. HOW TO PLAN FOR DASHBOARDING

A. SIZE AND POSITION TO SHOW HIERARCHY

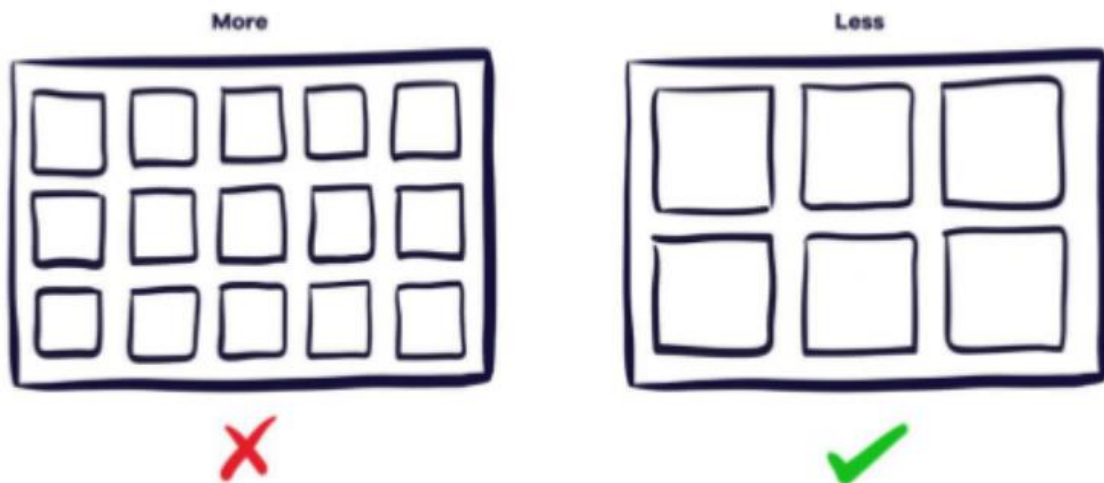


- A good dashboard shows vital sign of the company (think of the Car's dashboard).
- Humans tend to see the Z pattern:
 - Starting from upper left corner → We observe the Year to Date (YTD) Company's revenue.
 - Then the upper right corner → We observe that the reason could be negative cashflow at the start.
 - Then the lower left corner → Exclamation mark highlights a poor debt to equity ratio.
 - Then the lower right corner. → However our Short Term assets seem to be growing steadily, primarily due to inflow of Cash (blue colour bar) for the past 12 months.

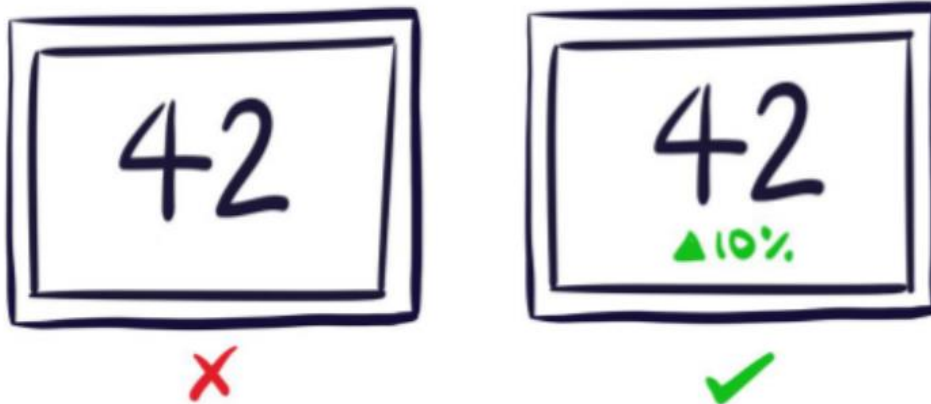


Use Size and Position to EMPHASIZE the most important information.

B. LESS IS MORE

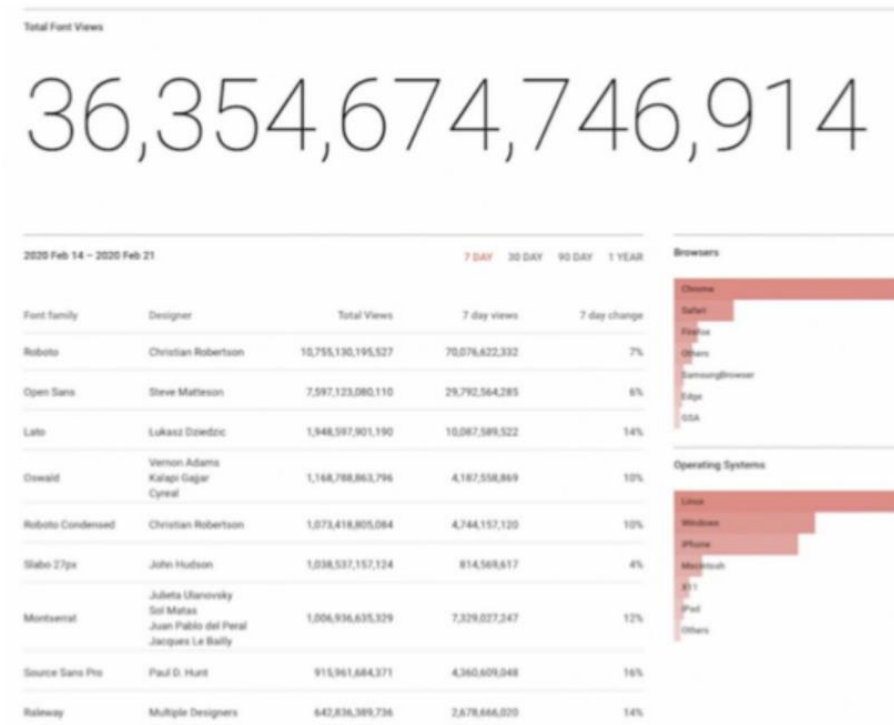


C. GIVE CONTEXT TO YOUR NUMBERS



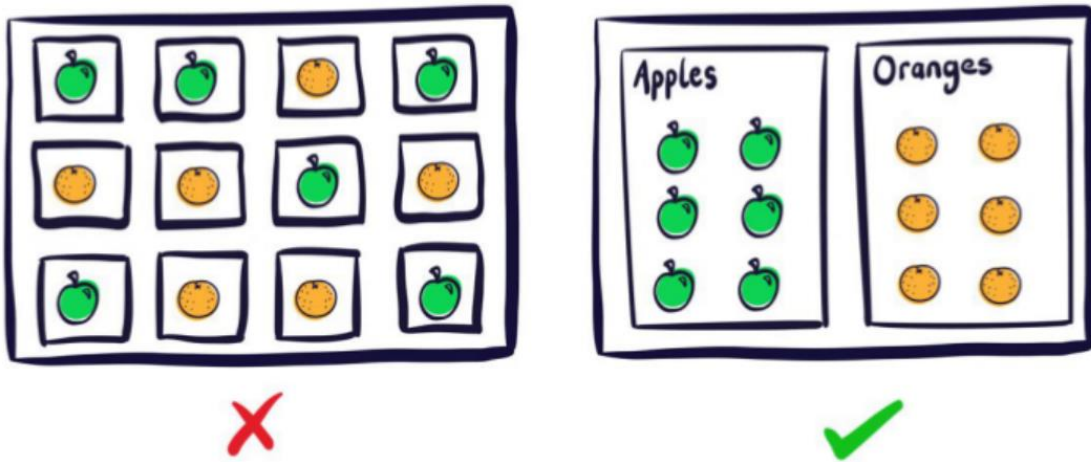
How do you know if 42 is big or small? Put a increased by 10% to show audience that its an improvement from the past.

D. SOMETIMES, USE TEXT FOR KEY METRICS



Sometimes, Text is more useful than graphics to show Key Information.

E. GROUP RELATED METRICS



Grouping related metrics help users find information easier.

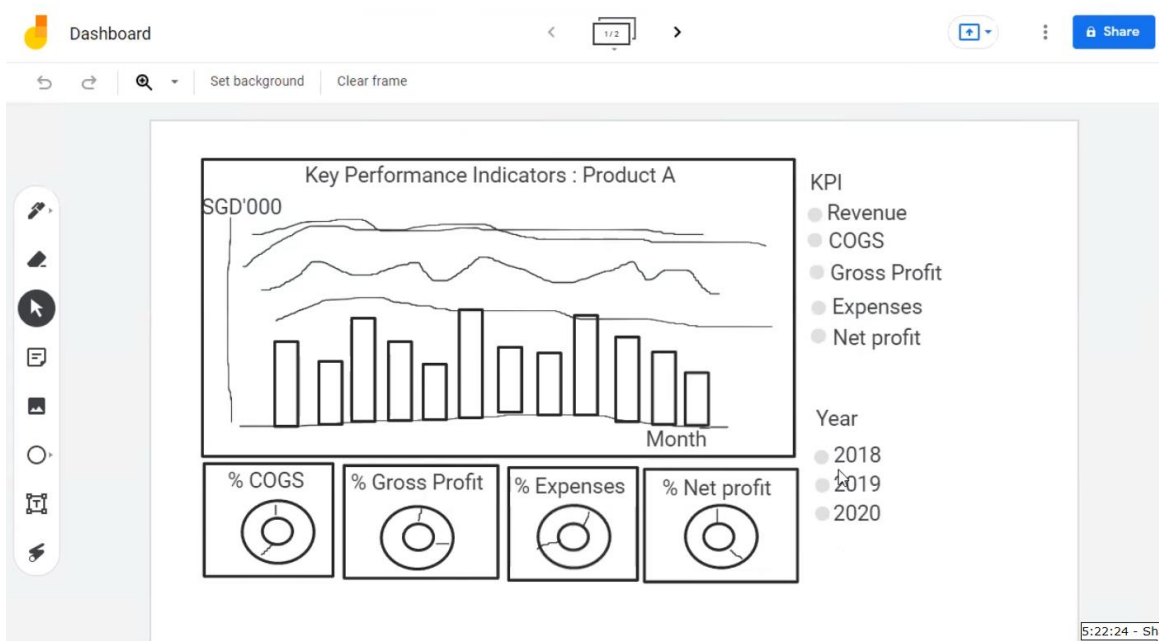
F. BE CONSISTENT



In the next section, we layout the steps / considerations for building a dashboard.

G. SOME USEFUL DASHBOARD PROTOTYPING TOOLS

- Dashboard Prototyping = Wire Framing
- <https://www.figma.com/>
- <https://www.uxpin.com/>
- <https://www.adobe.com/sg/products/xd.html>
- <https://jamboard.google.com/>



H. STEP 1: REQUEST

1. OBJECTIVE

- Who is requesting for your dashboard?
- Why are you building it?
- What is the objective?

2. IMPACT

- What will be the impact after completing your dashboard?

3. AUDIENCE

- Who will be looking at your dashboard? The CEO? Your peers? Colleagues?

4. DATA

- What kind of data will you be handling?
- What kind of data will you be feeding into your dashboard?

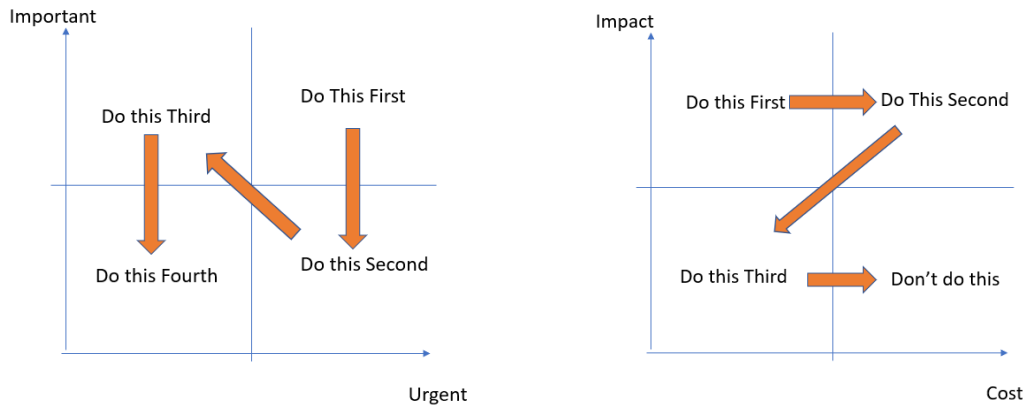
5. INTERACTIONS

- What kind of interactions do your stakeholders expect out of your dashboard?
- Do they expect a static dashboard? Or one that can click around a lot?

I. STEP 2: PRIORITIZATION

1. URGENT VS IMPORTANT (SIMILAR TO IMPACT VS COST)

- Now that we know the objective of building our dashboard, we have to prioritize.



- Cost refers to time and effort.
- Obviously, we want to do pluck the “low hanging fruit” = High Impact, Low Cost
- The least tedious yet highest reward is what we go for.
- Who is going to see your dashboard? CEO = Great impact
- How many people are going to see your dashboard? Many people = Great impact

2. HOW MANY DASHBOARDS DO YOU NEED TO BUILD? MANY? ONE?

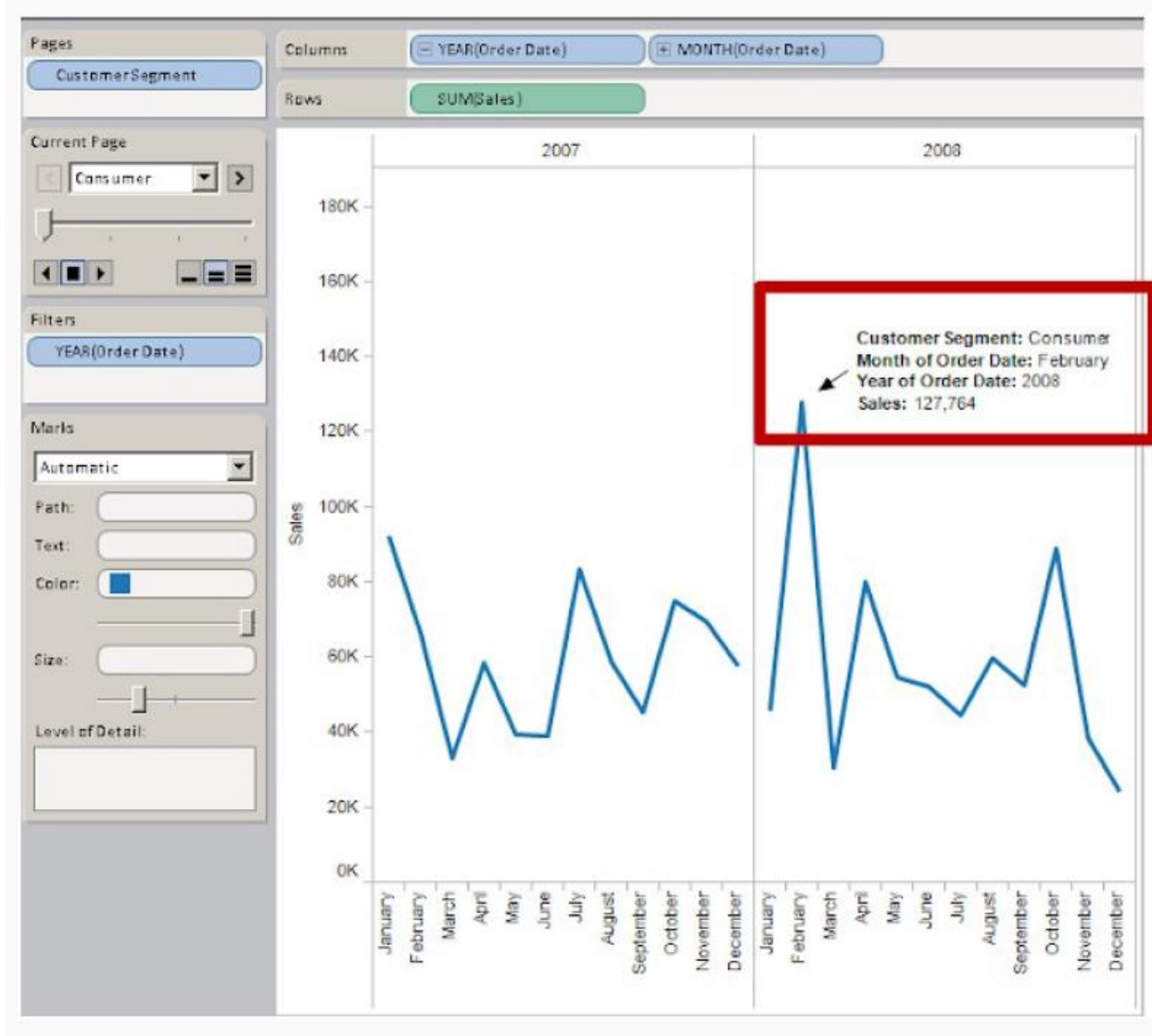
- If you use pre-existing dashboards, you will require lesser time and effort = low cost
- If you are building your dashboard from scratch, higher time and effort = high cost

J. STEP 3: DOCUMENTATION

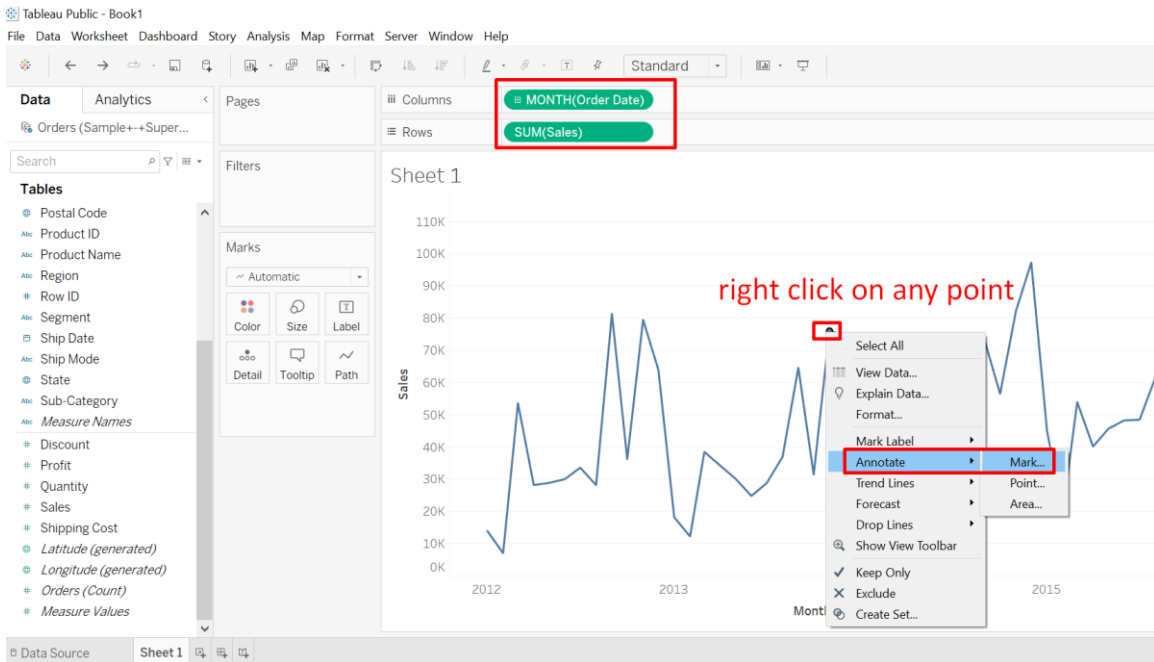
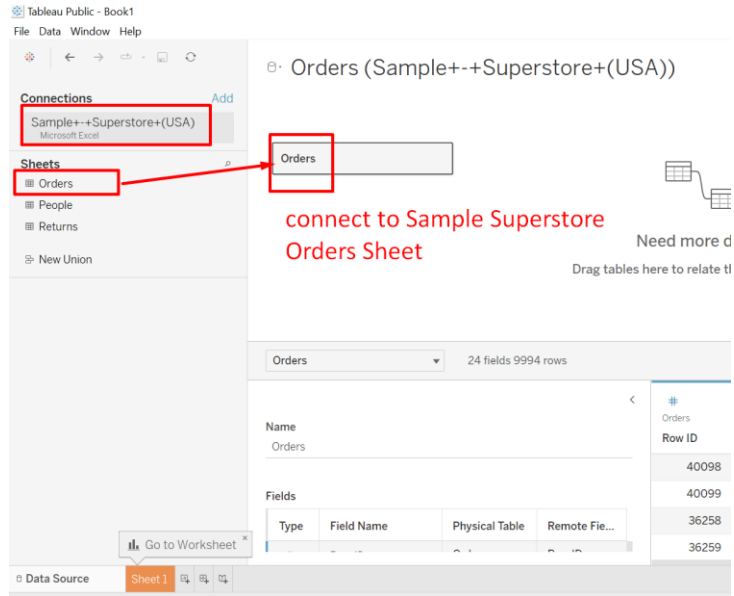
- What sort of documents do you need to keep?
 - What's the objective of keeping your documents?
- What sort of documents do you need to request for?
 - From your Stakeholders?
 - From your audience?
- Where are your Data Sources?
- Any Calculations do you need to document?

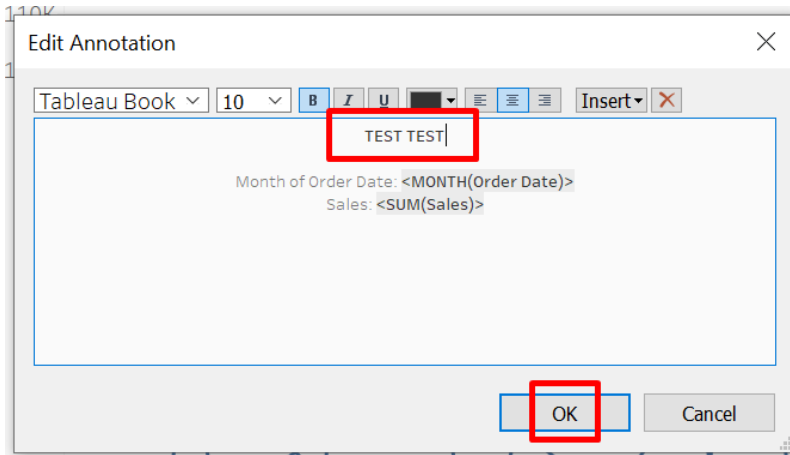
K. STEP 4: DESIGN

- What kind of design would be good for our dashboard?
- Remember to highlight important aspects from your data using Text Boxes.



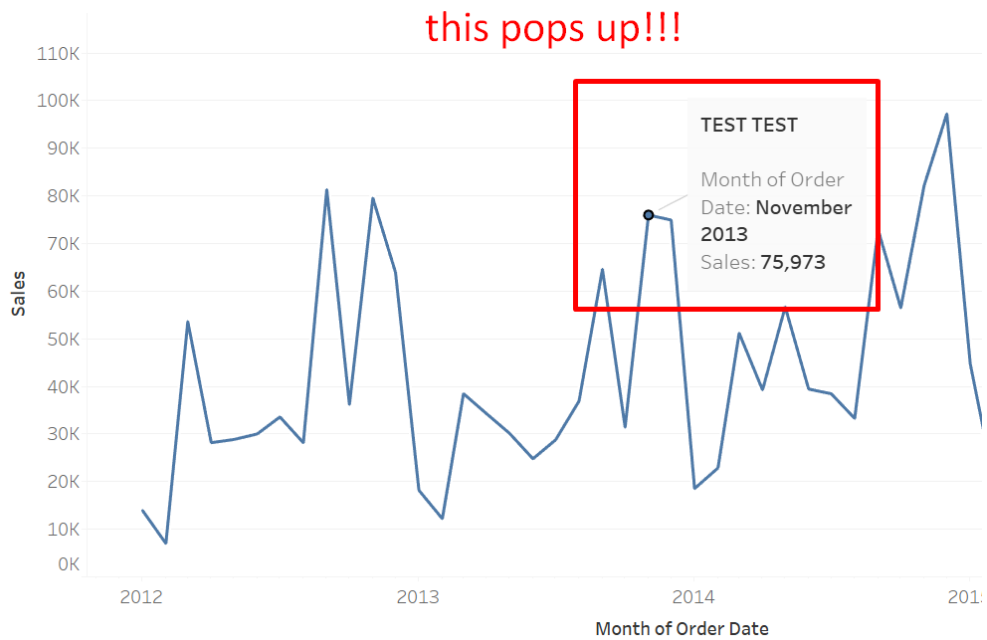
1. HOW TO DO ANNOTATION FEATURE / TEXTBOX

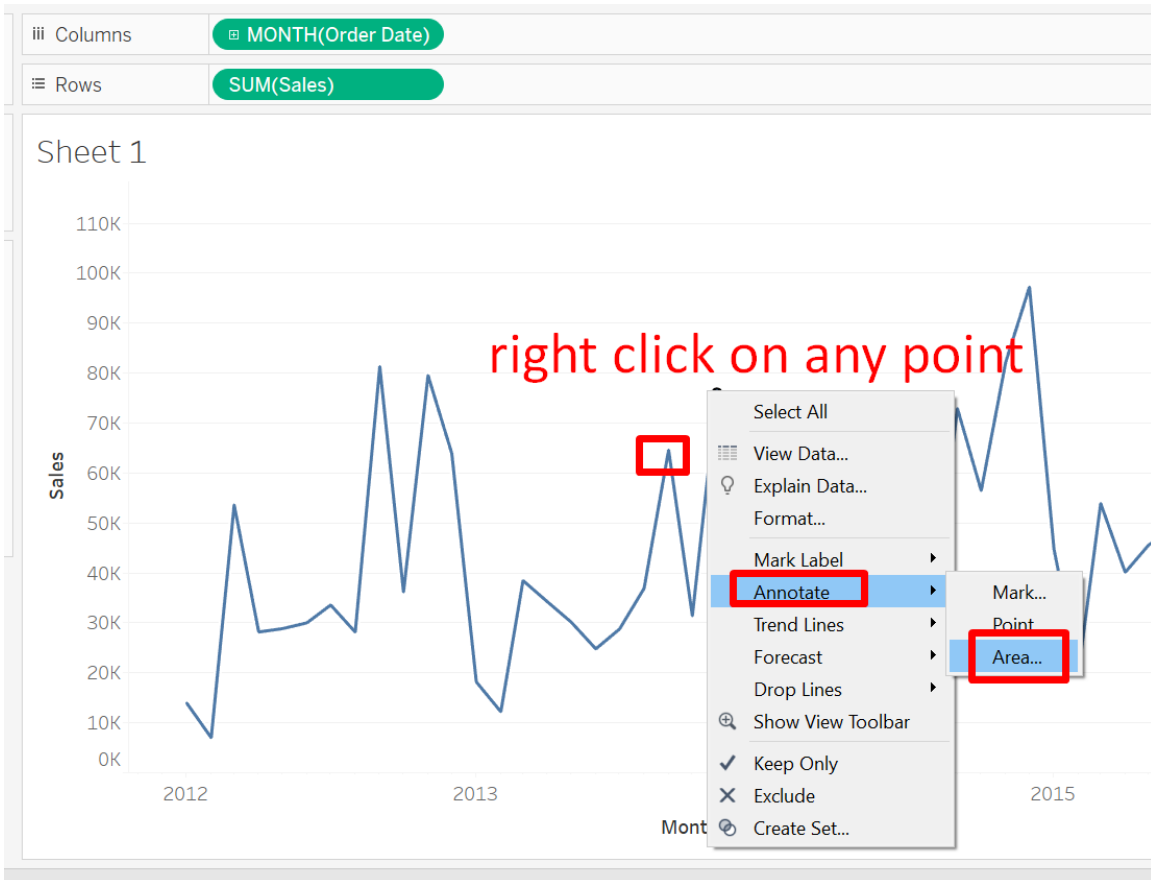




Columns	MONTH(Order Date)
Rows	SUM(Sales)

Sheet 1





Edit Annotation

Tableau Book | 10 | B | I | U | Insert | X

TEST TEST TEST

OK | Cancel

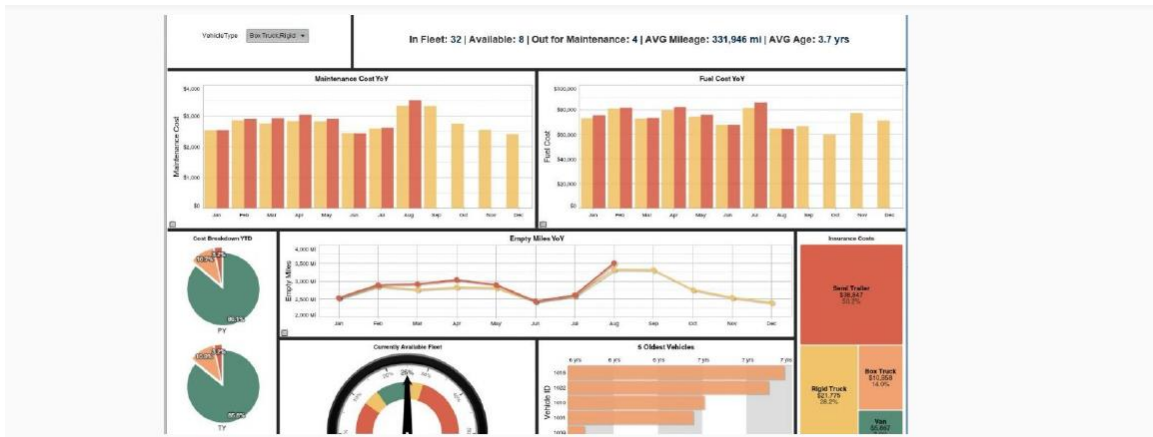
Columns	MONTH(Order Date)
Rows	SUM(Sales)

Sheet 1



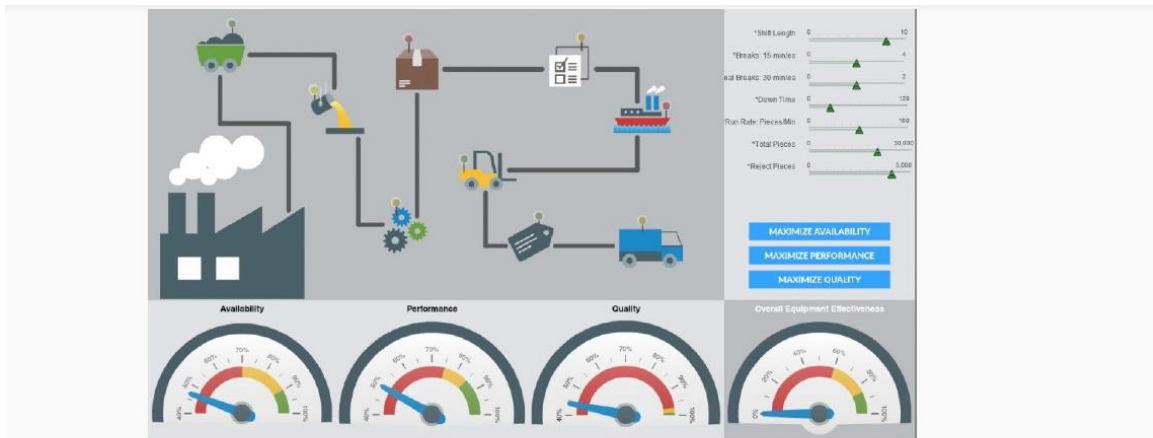
L. STEP 5: DEVELOPMENT

1. OPERATIONAL DASHBOARD



<https://www.idashboards.com/dashboard-examples/transportation-logistics-dashboard-fleet-management/>

2. ANALYTICAL DASHBOARD



<https://www.idashboards.com/dashboard-examples/manufacturing-dashboard-manufacturing-process/>

3. STRATEGIC DASHBOARD



M. STEP 6: DELIVERY

Finally, when its time to deliver our final dashboard, we have to think about its:

1. FUNCTIONALITY

- Interactivity
- Usability
- Clarity

2. TECHNICALITY

- Data Freshness and Quality
- Performance
- Availability

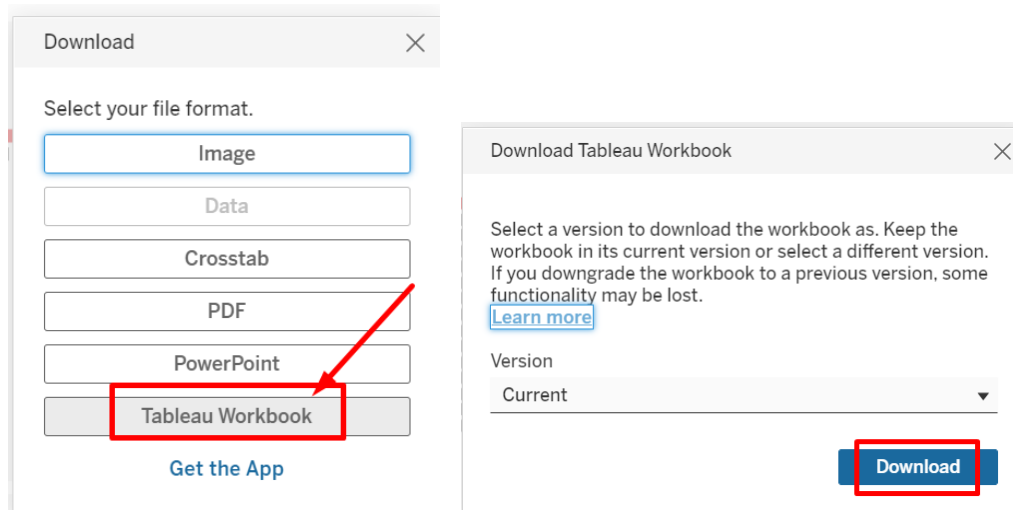
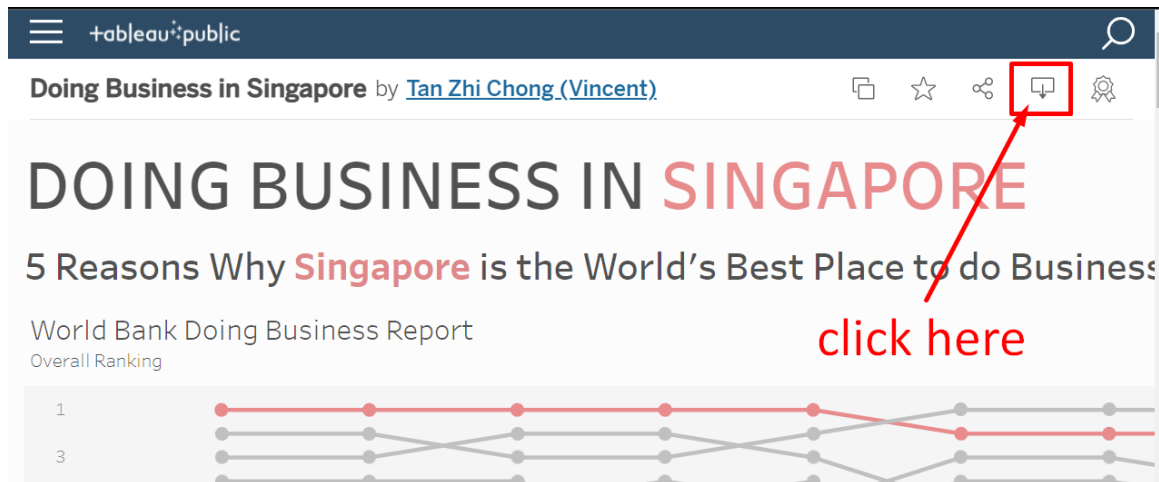
IV. DOING BUSINESS IN SINGAPORE

A. PAINS OF USING OTHER AUTHORS TEMPLATE

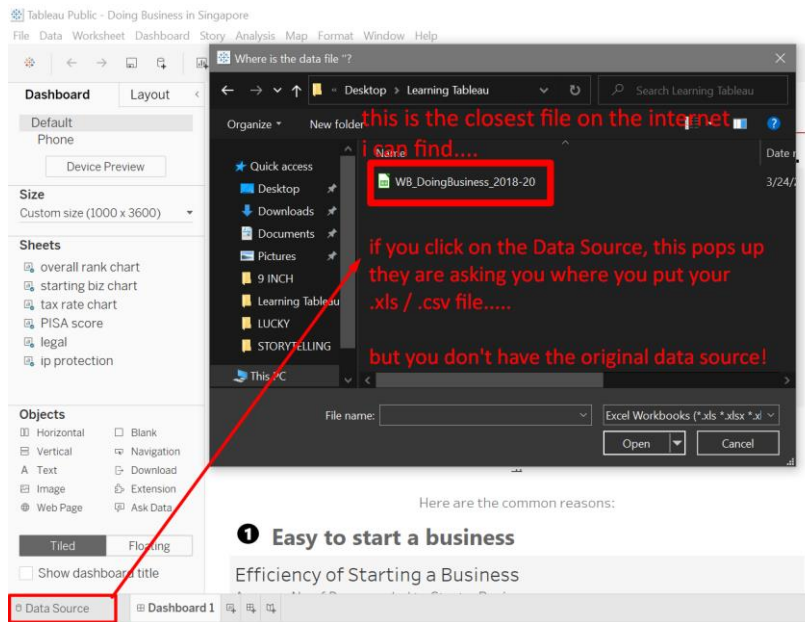
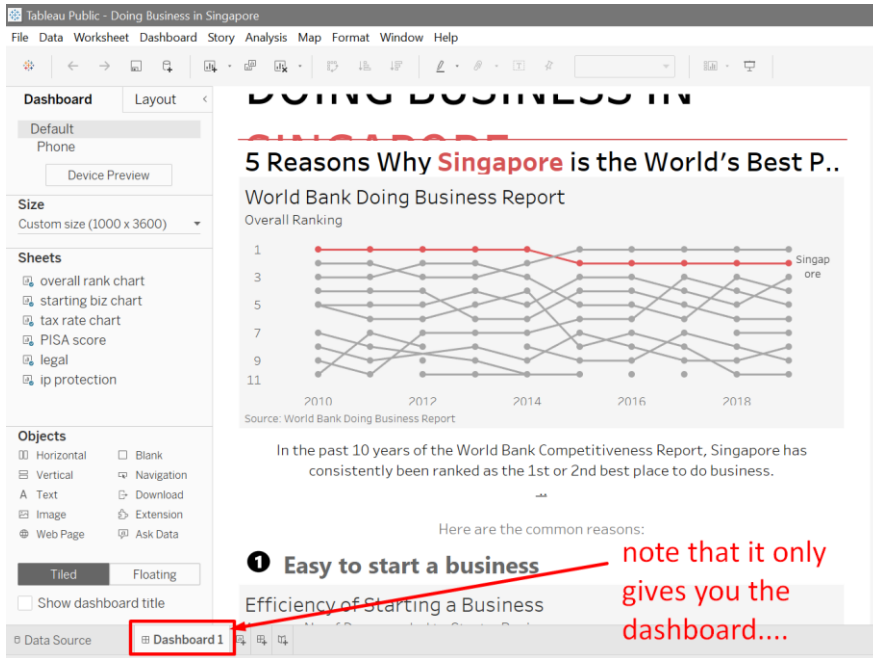
1. PROBLEMS CONNECTING DATA SOURCE (YOU DON'T HAVE HIS ORIGINAL DATASET)

Go here:

<https://public.tableau.com/app/profile/vincenttzc/viz/DoingBusinessinSingapore/Dashboard1>



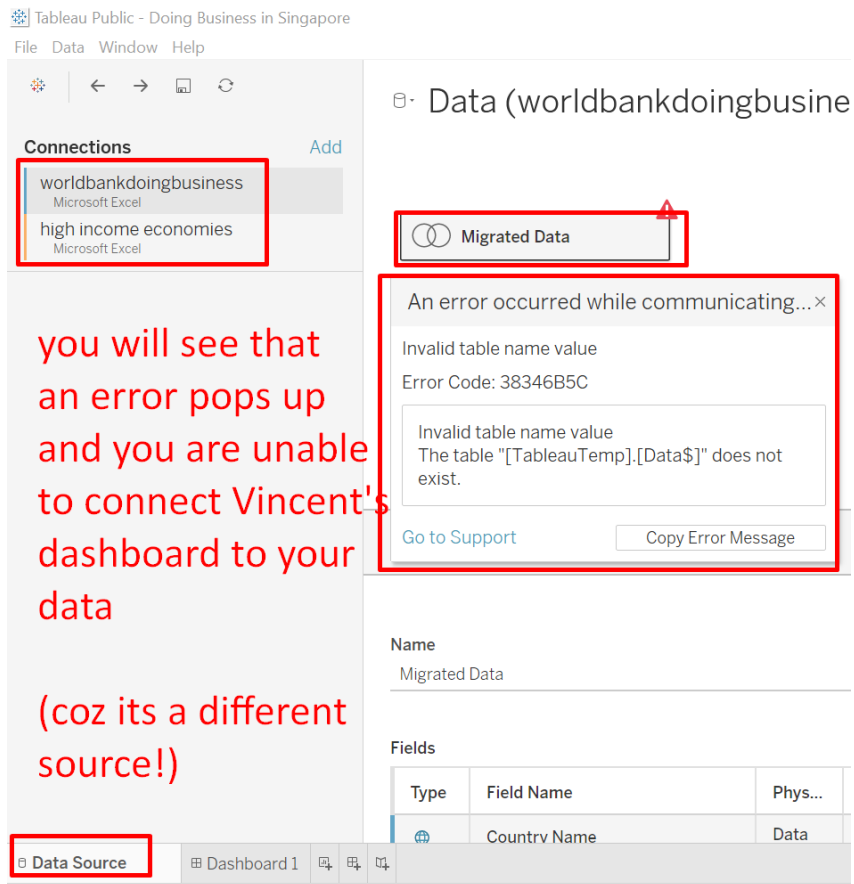
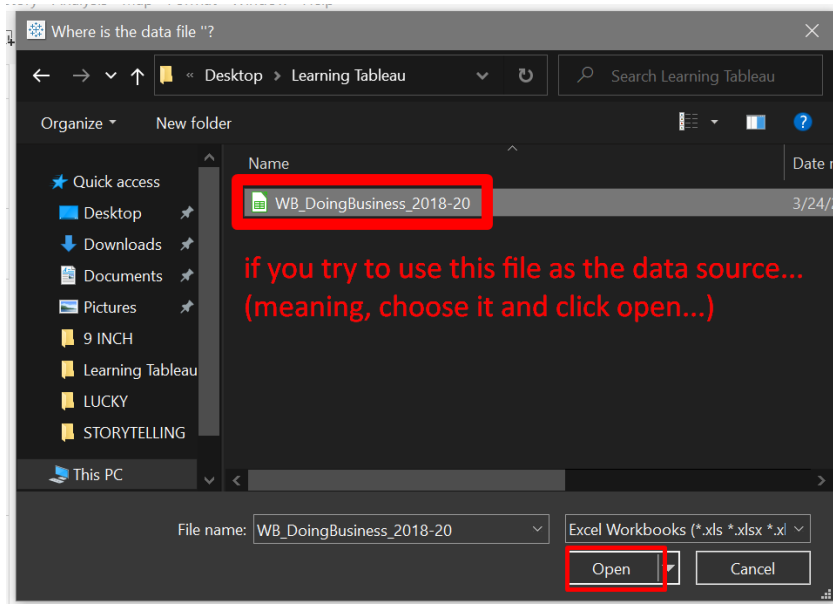
Then use Tableau Public to open the DoingBusiness in Singapore.TWBX

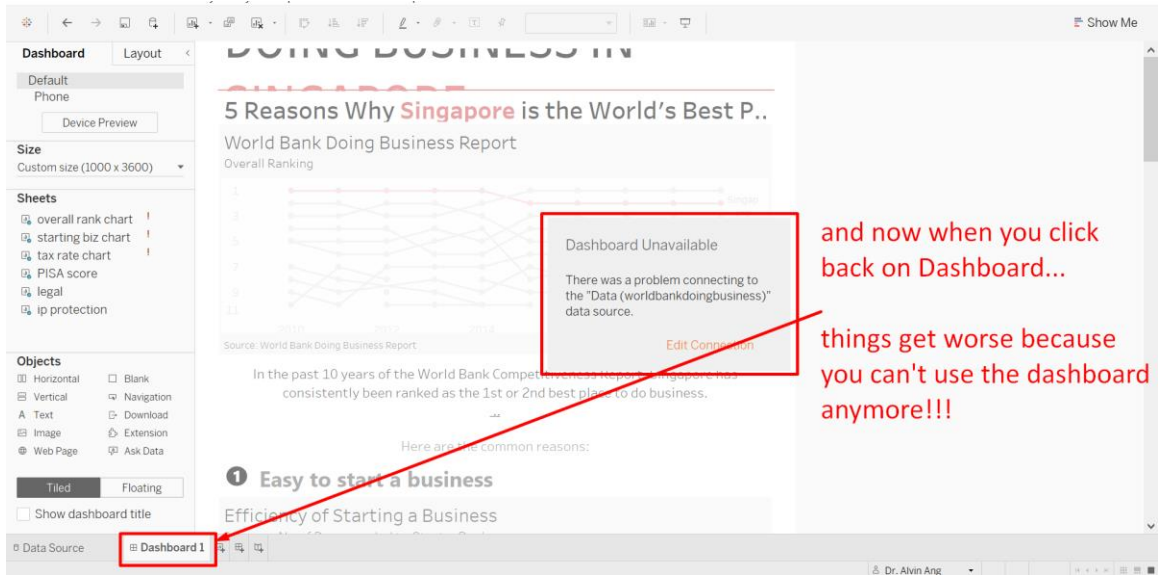


The “closest” file can be found here:

<https://www.kaggle.com/datasets/fkosmowski/cdp-ease-of-doing-business>

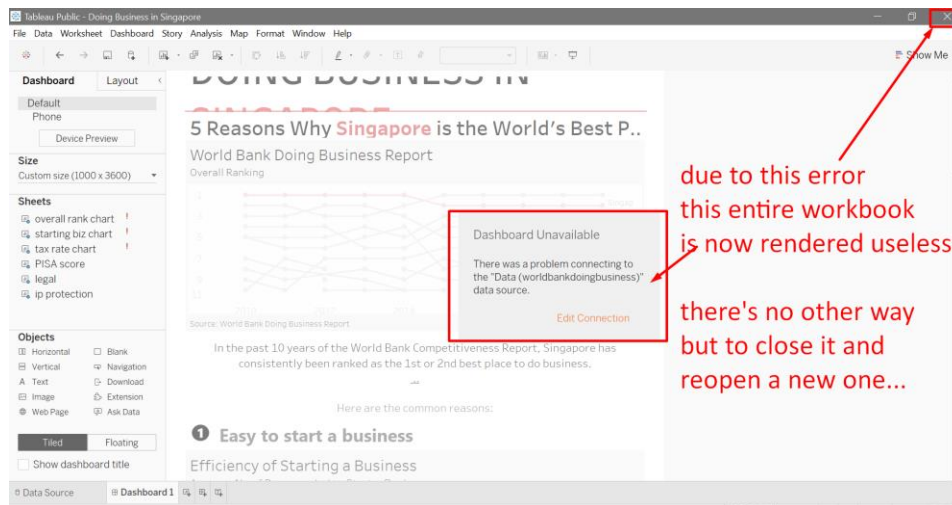
https://www.alvinang.sg/s/WB_DoingBusiness_2018-20.xls





This shows that:

- You can go to <https://public.tableau.com/app/discover> and find lots of templates from different authors
- BUT! You don't know where they get their main data source from..... and the best you can do is to try google for the closest match....
- However, you can't use their template fully because you can't connect the original data source to the authors work (because you don't have their dataset).



2. SOLUTION: OBTAIN HIS DATA DIRECTLY

Tableau - Doing Business in Singapore

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Dashboard 1

5 Reasons Why Singapore is the World's Best P..

World Bank Doing Business Report

Overall Ranking

Rank	2012	2014	2016	2018
1	Singapore	Singapore	Singapore	Singapore
2				
3				

open up a completely new workbook of Vincent's.... then right click Dashboard and click Copy

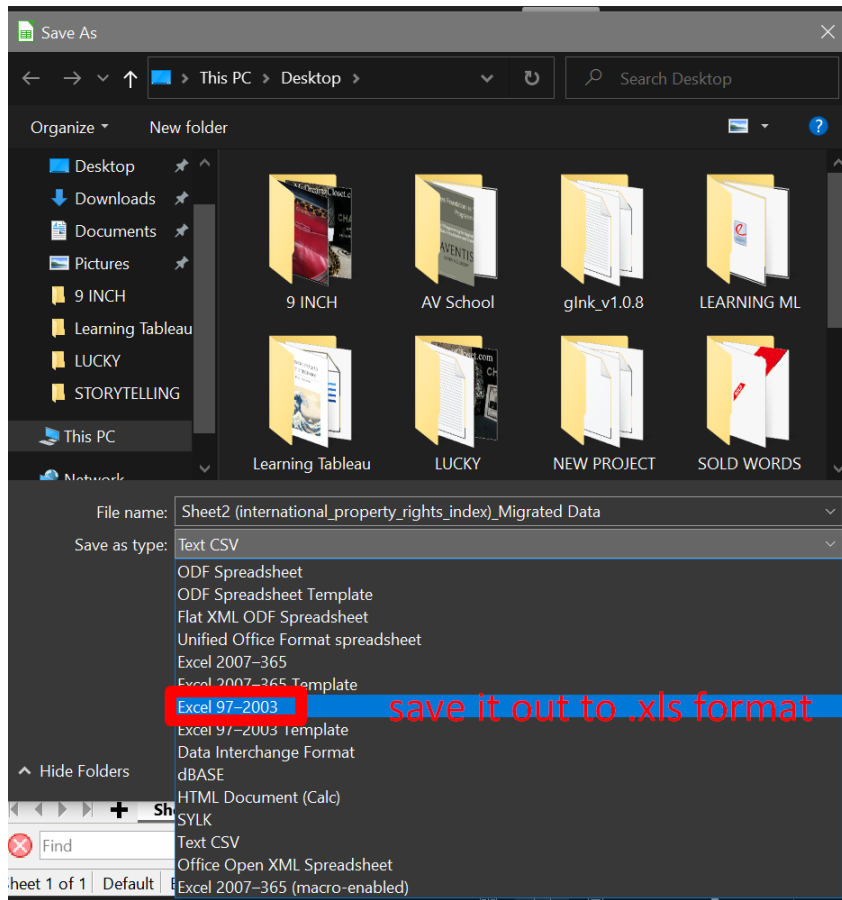
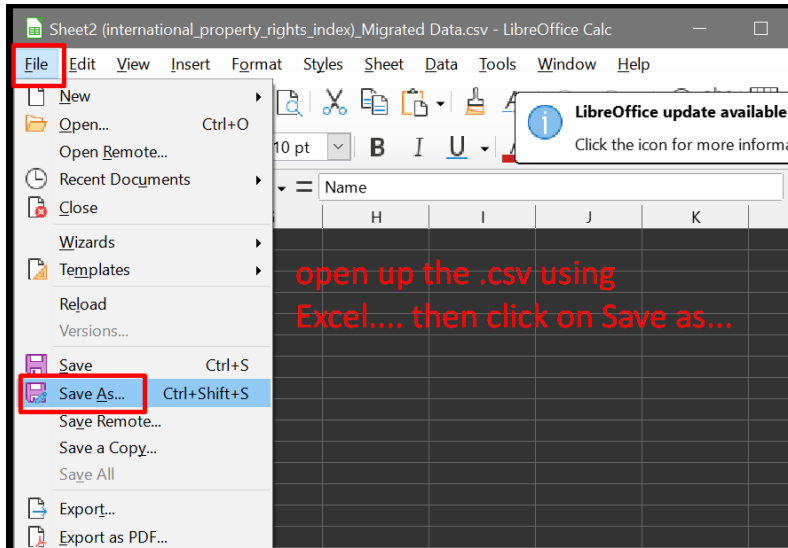
right click anywhere on this blank space here and click paste.....

for this ip protection sheet, we can now export the entire data that Vincent was using.....

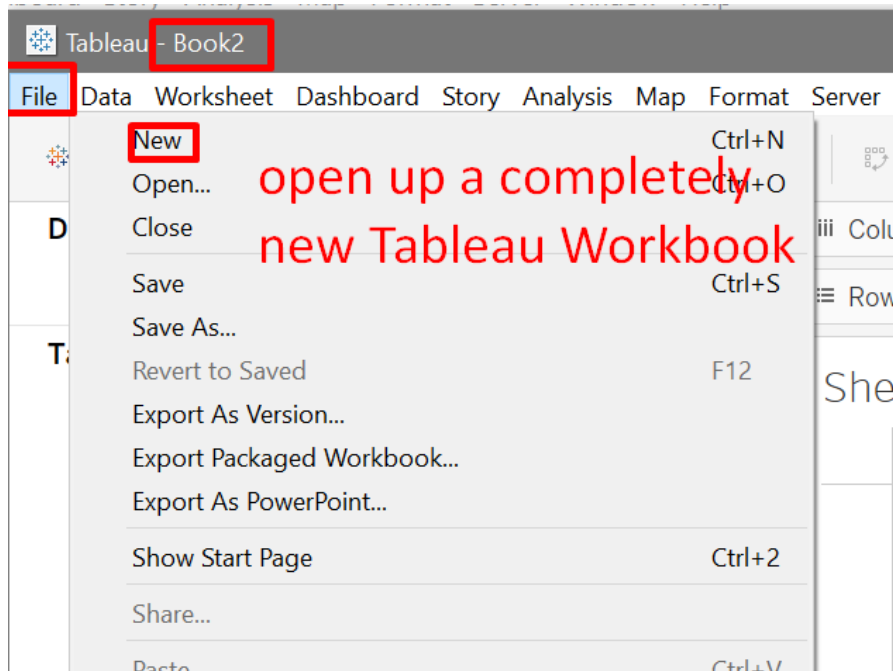
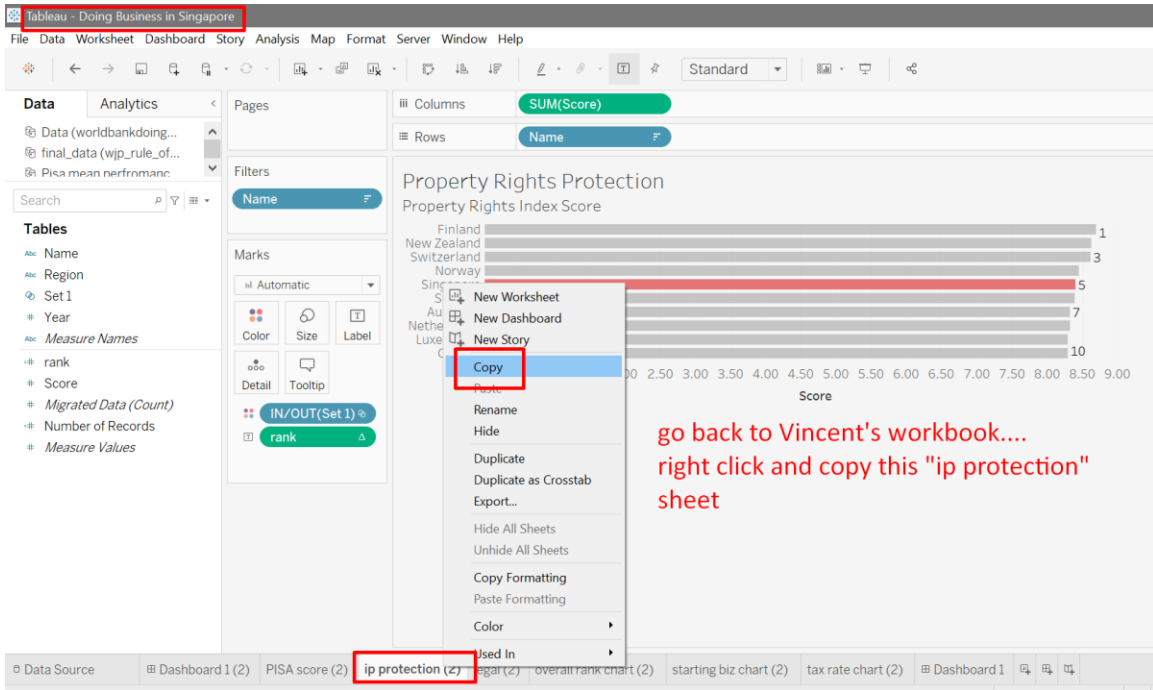
an entire list of all charts appear....

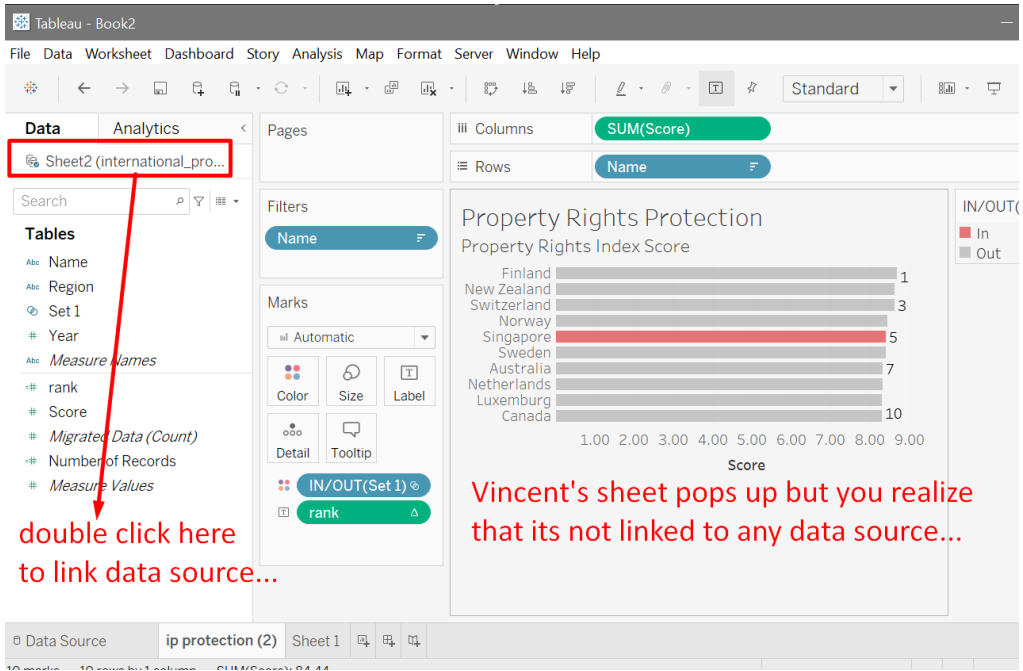
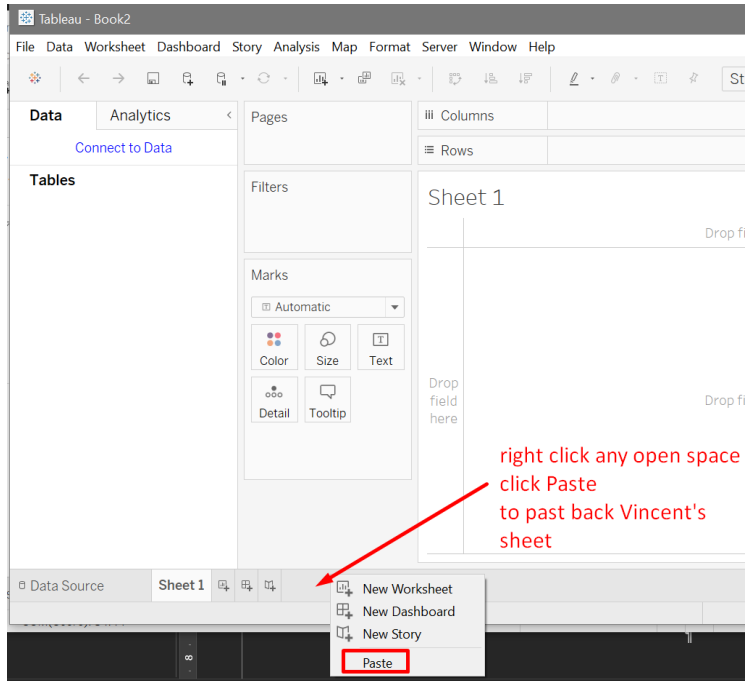
Country	Score
Finland	1
New Zealand	3
(Unlabeled)	5
(Unlabeled)	7
(Unlabeled)	10

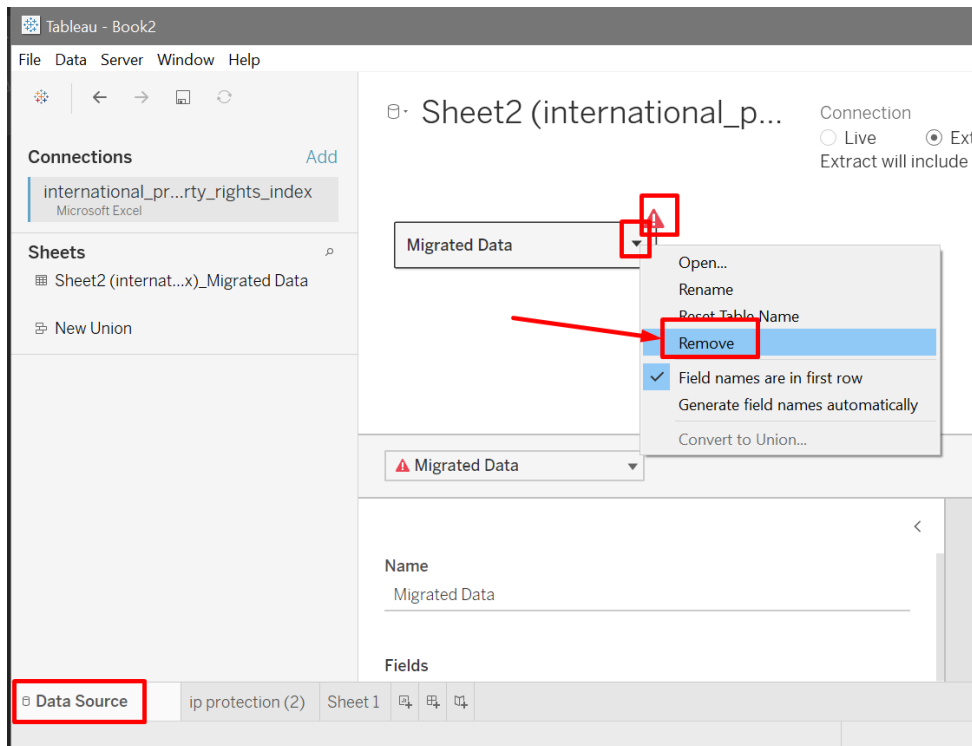
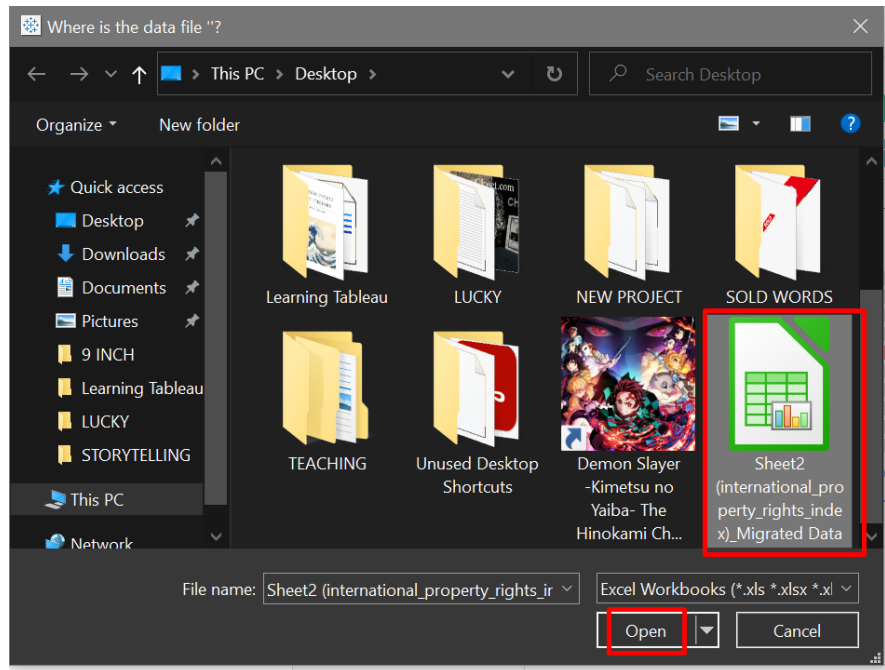
let's temporarily save this on our Desktop as .csv.....

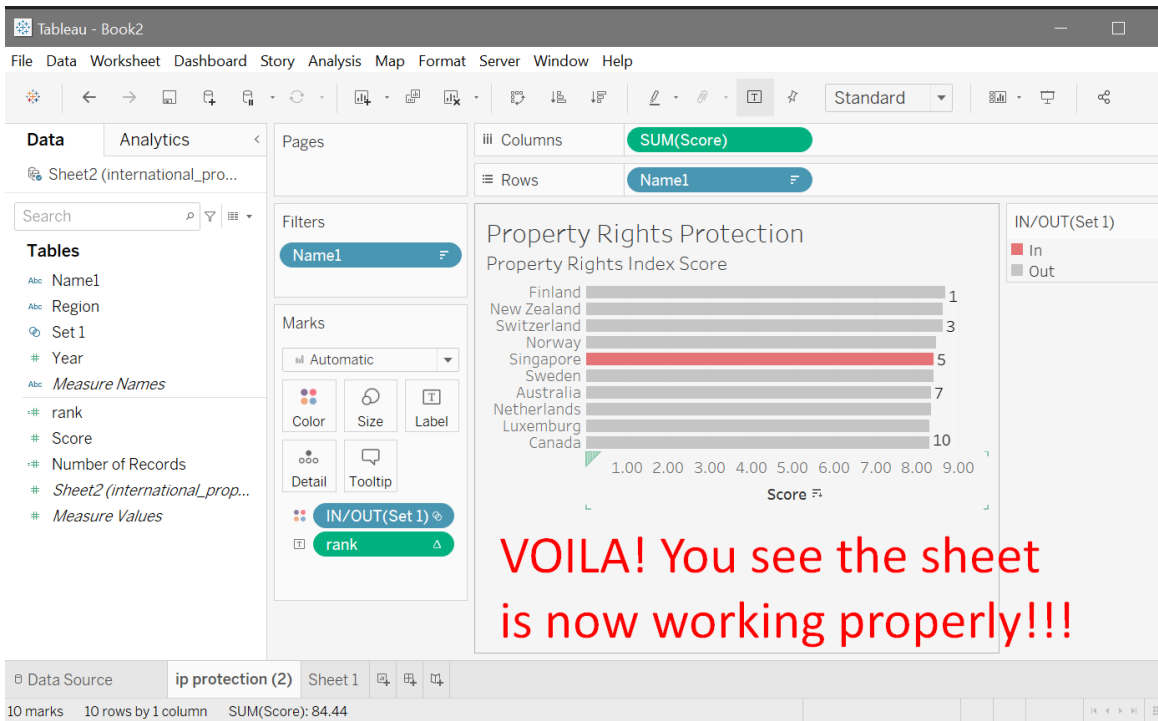
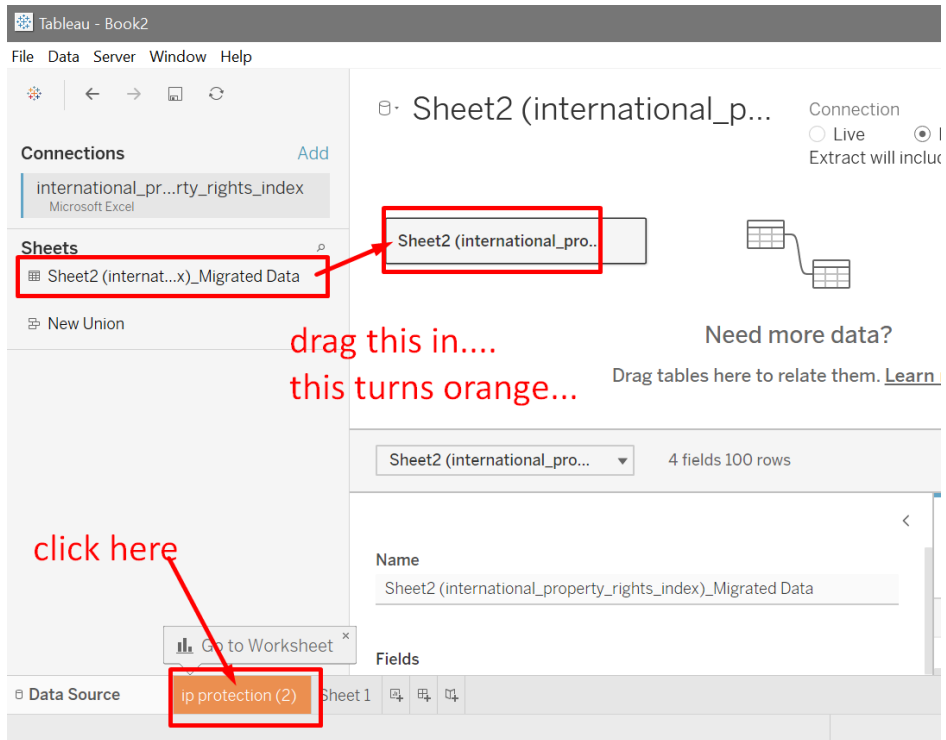


3. USE BACK VINCENT'S SHEET

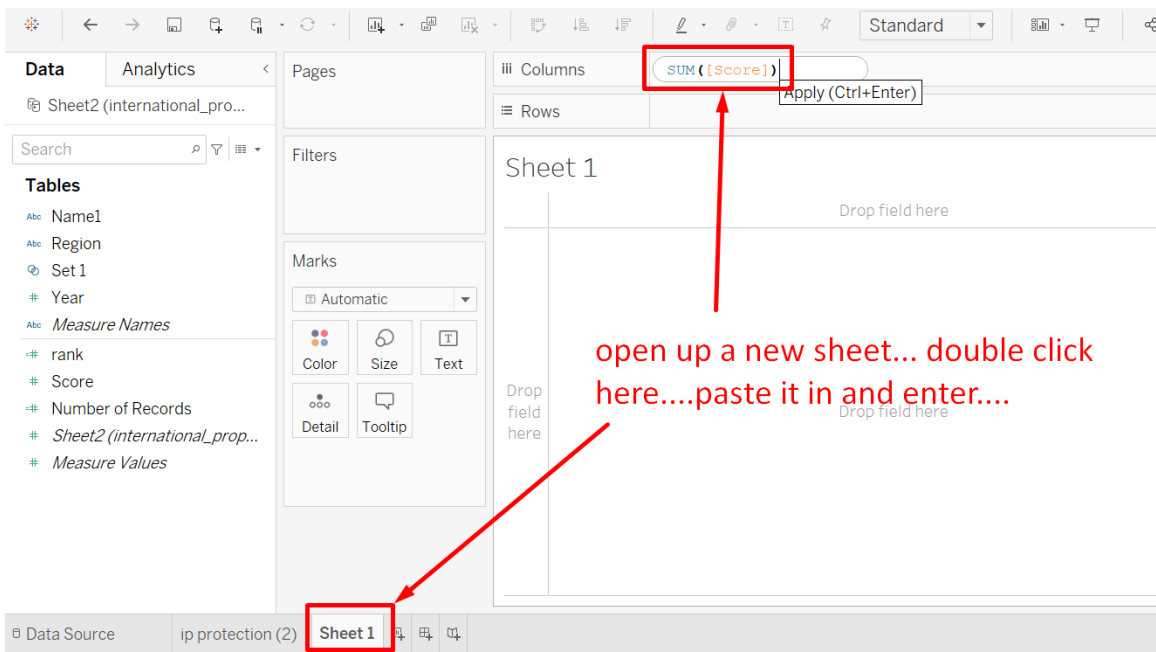
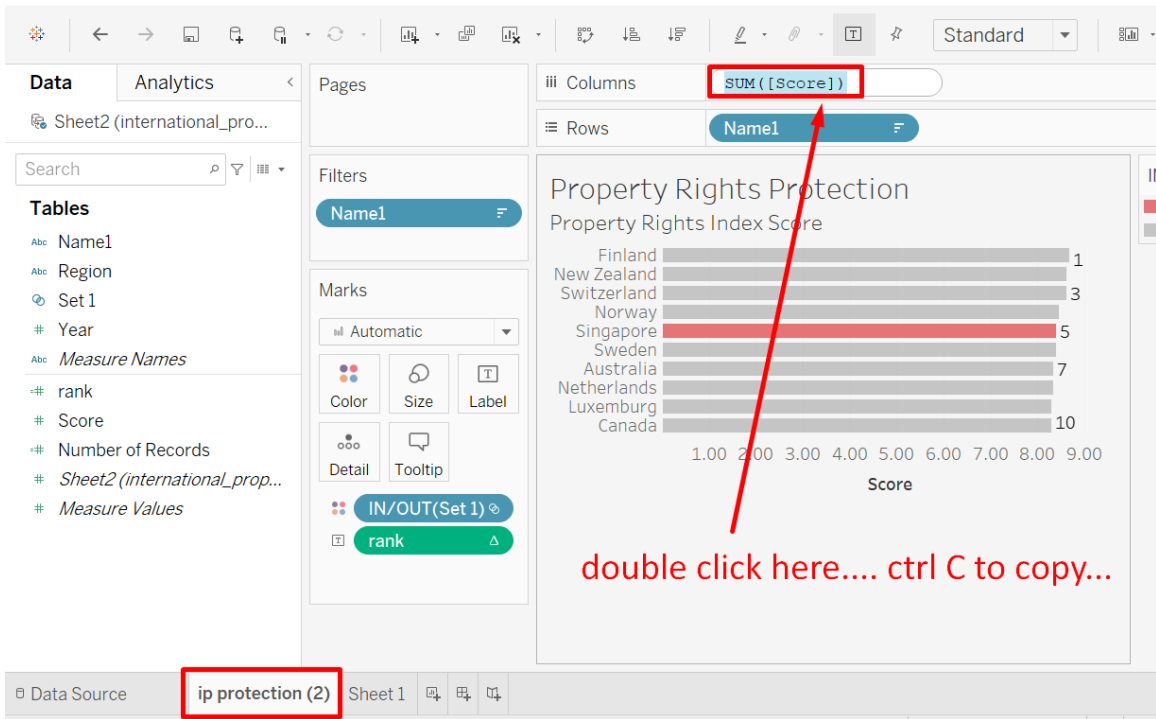


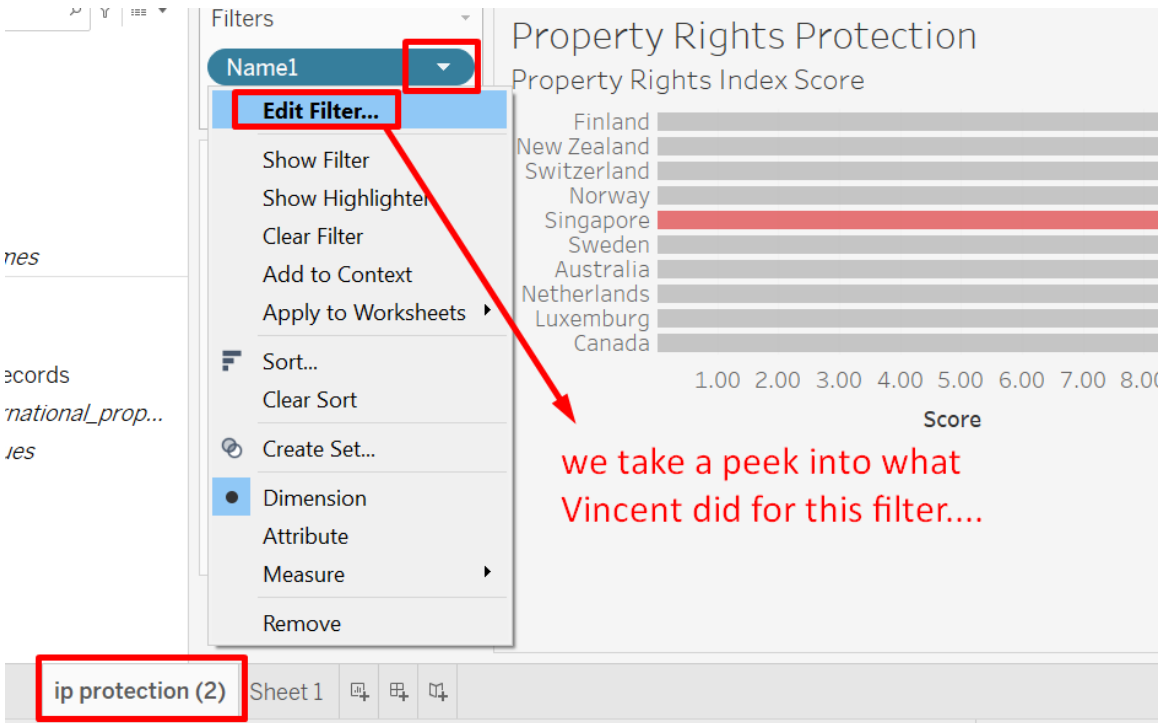
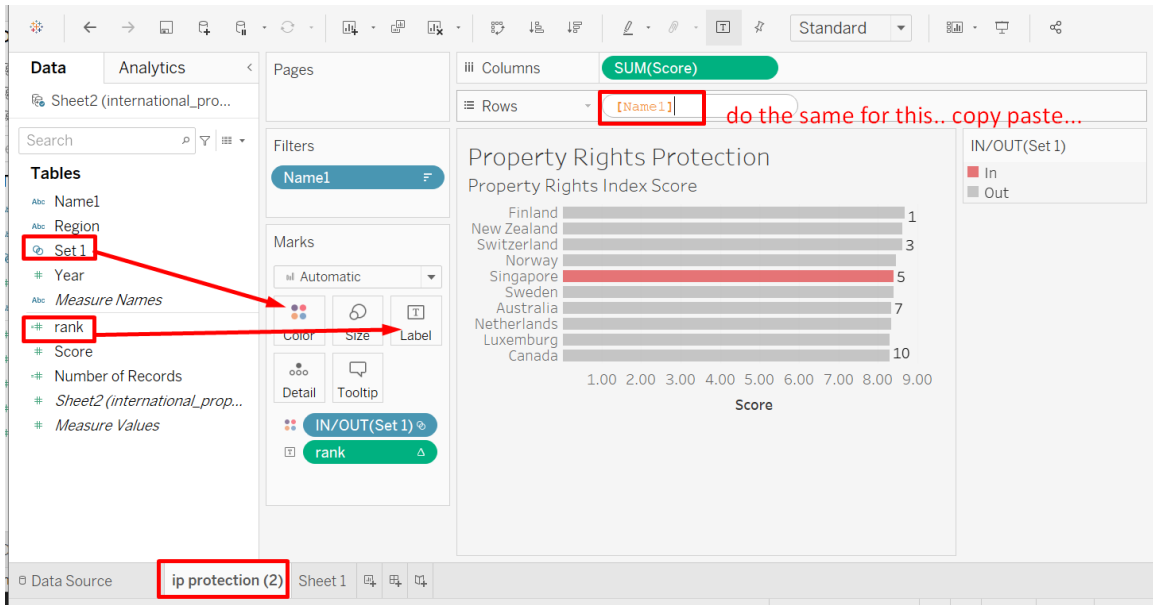


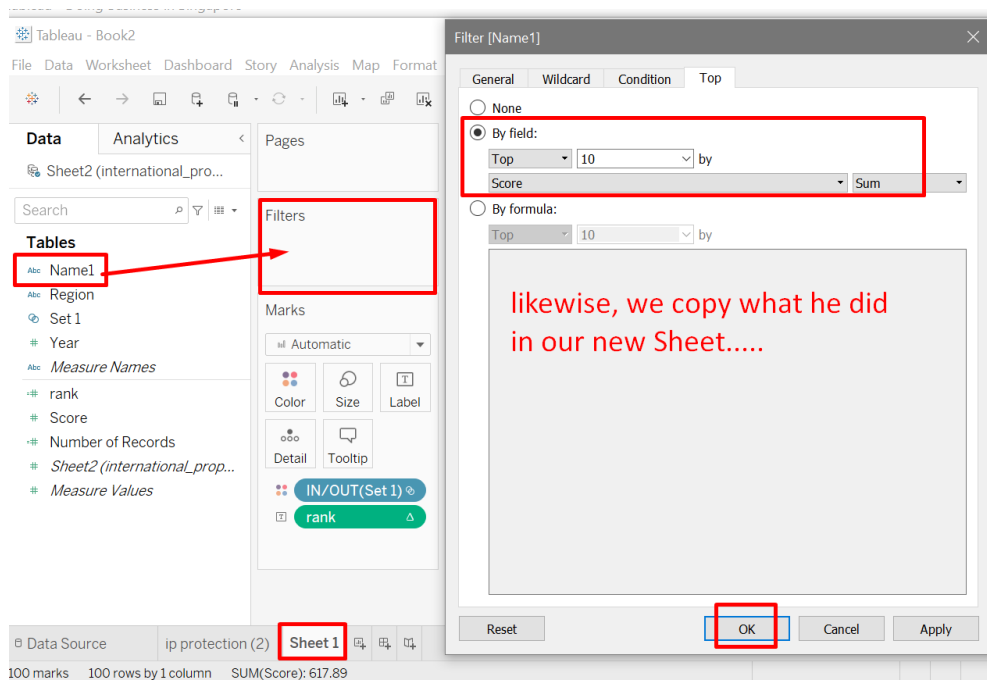
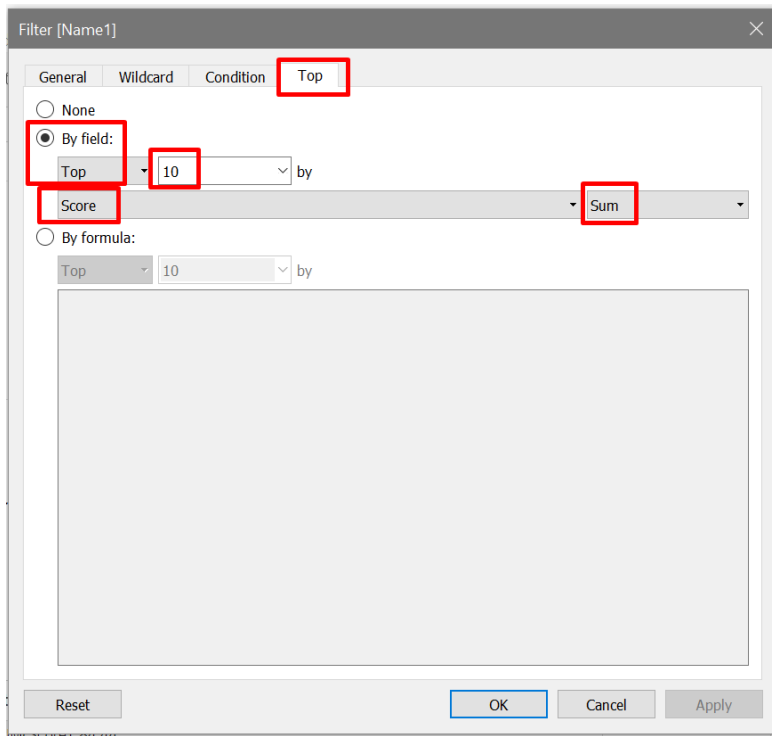


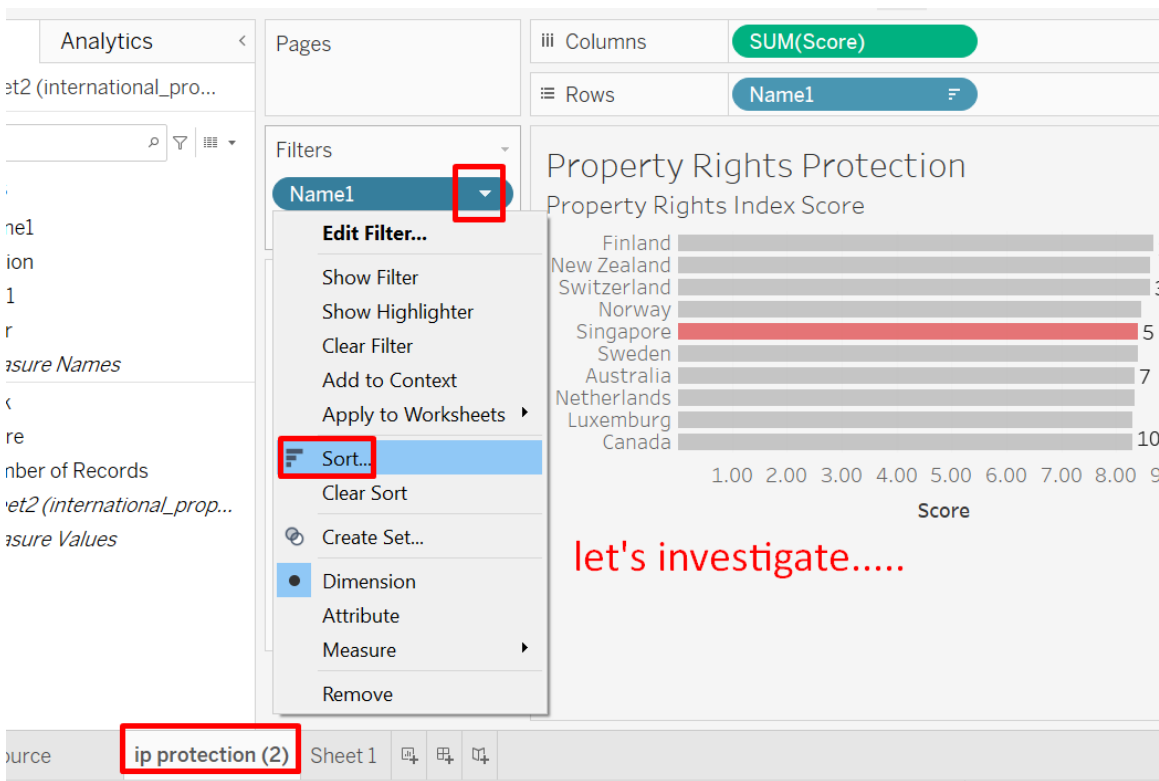
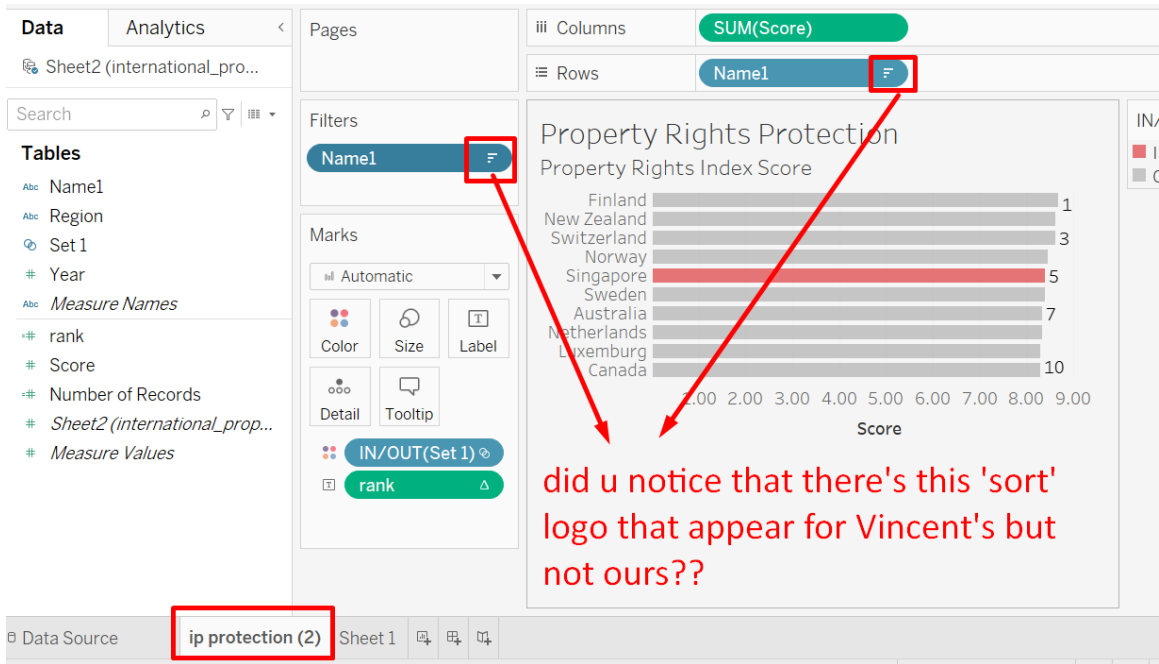


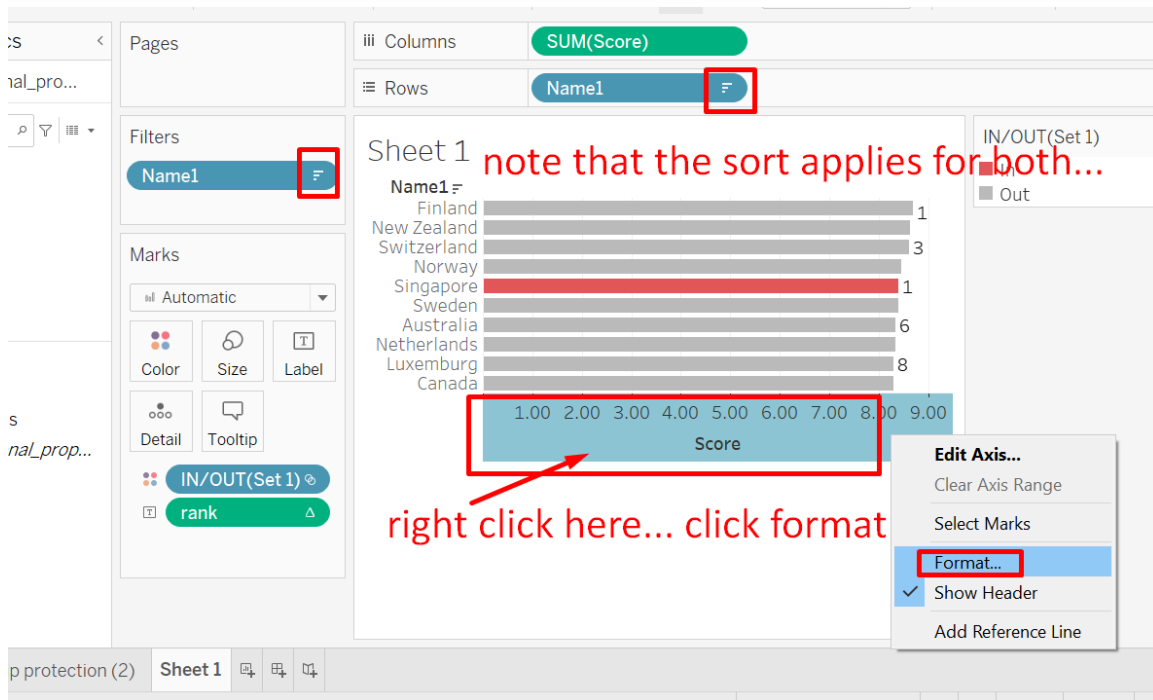
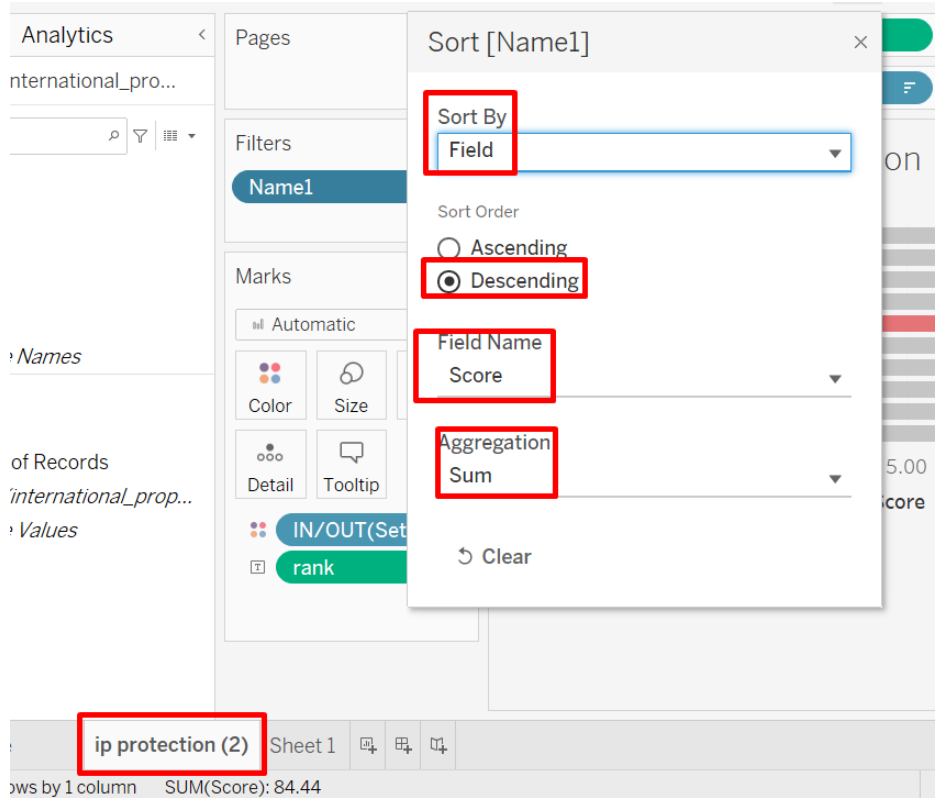
B. IMITATE HIS WORKSHEET











Format Shading

Worksheet: **None**

Header: **None**

Grand Total: **None**

Filters: Name1

Columns: SUM(Score)

Rows: Name1

Sheet 1

IN/OUT (Set 1)

rank

notice the background changes color....

Country	Score
Finland	1
New Zealand	3
Switzerland	1
Norway	1
Singapore	1
Sweden	1
Australia	6
Netherlands	1
Luxemburg	8
Canada	1

Property Rights Protection

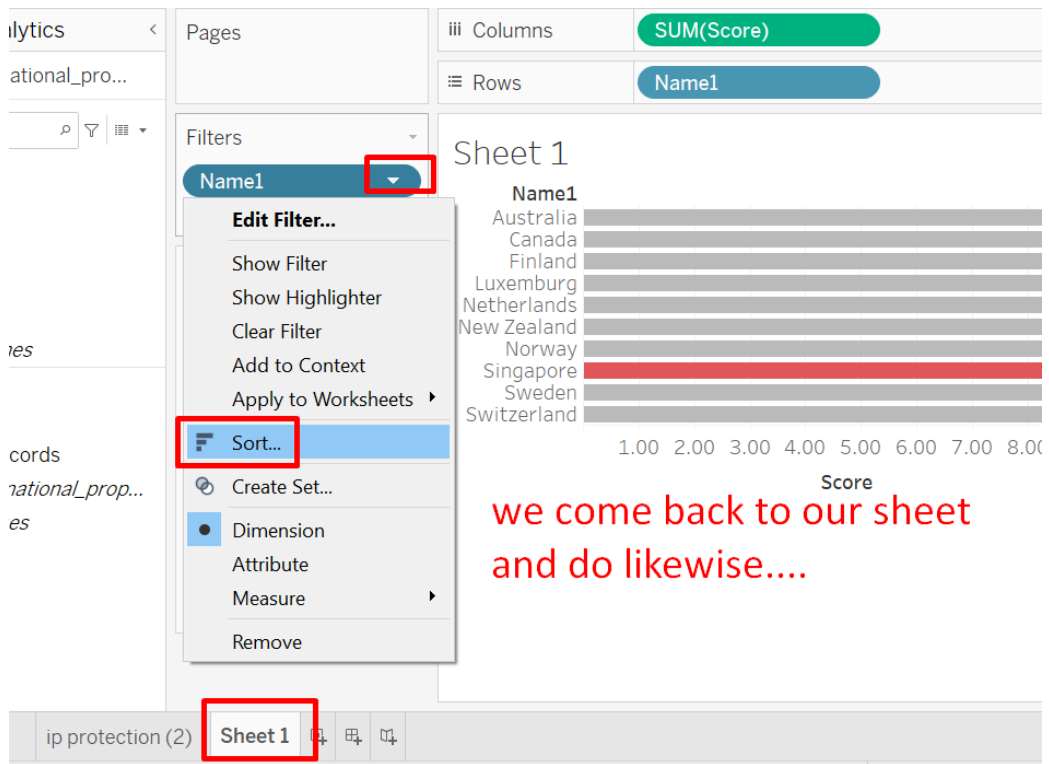
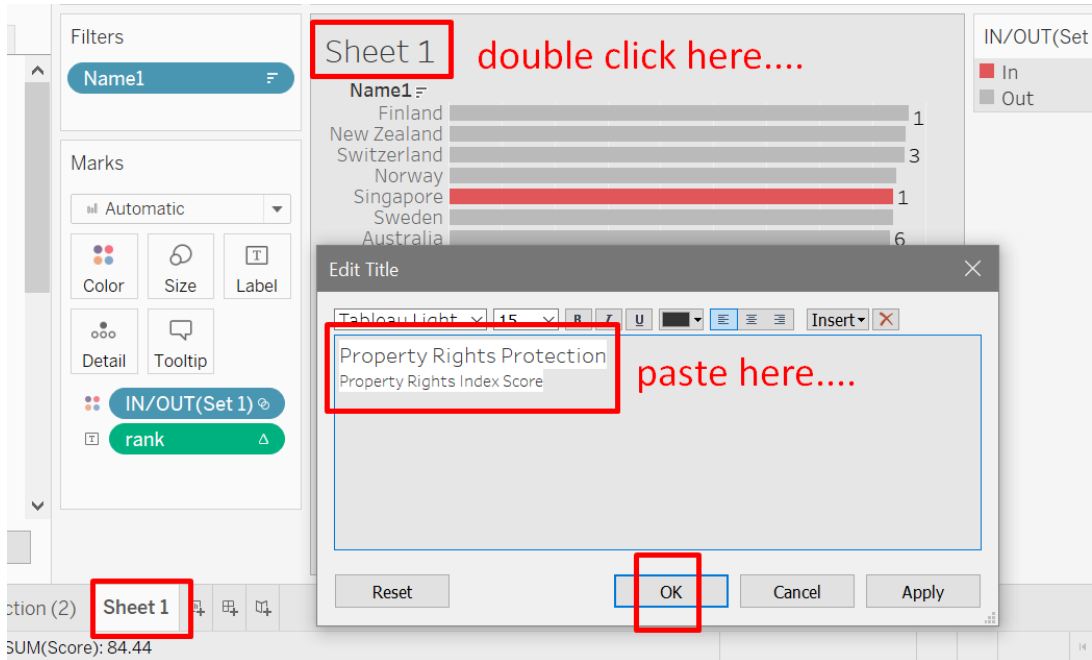
Property Rights Index Score

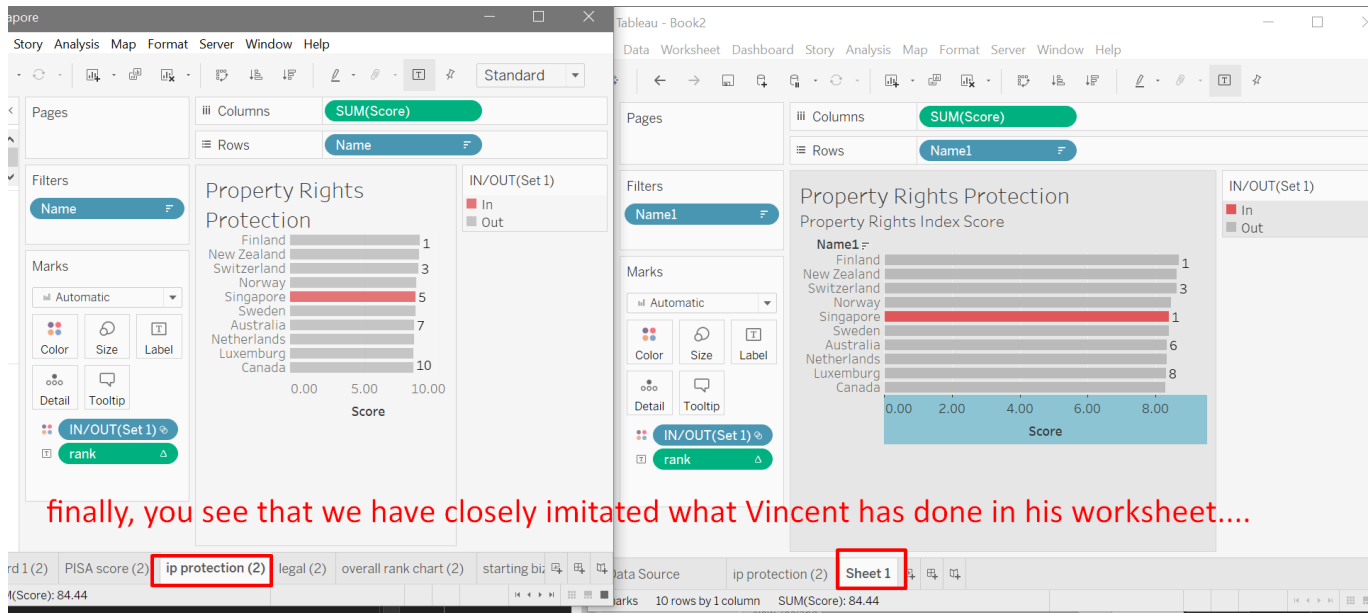
double click here....

copy everything here...

come back here....

ip protection (2)





C. CONCLUSION

- Trying to copy other's people work EXACTLY isn't easy.
- Authors do much more formatting which we can't know the exact details.
- Word of advice:
 - Don't try to copy everything.
 - You can copy the Dashboard formatting and perhaps their font sizes used.
 - But Worksheets.... Measures / dimensions / filters.... Calculated fields.... You won't know exactly what they did (unless you copied their entire worksheet, but you will lose out on complete understanding).
 - Once you manage to extract their data source / data set from their dashboard, you can vary their work and present it in your own manner....

V. ABOUT THE AUTHOR



ABOUT DR. ALVIN ANG

Dr. Alvin Ang earned his Ph.D., Masters and Bachelor degrees from NTU, Singapore. He was a previously a Professor, Scientist and Financial Consultant. Currently, he owns multiple self-started businesses and is a Personal/Business Advisor.

More about him at www.AlvinAng.sg