DAX and Basic Visualizations

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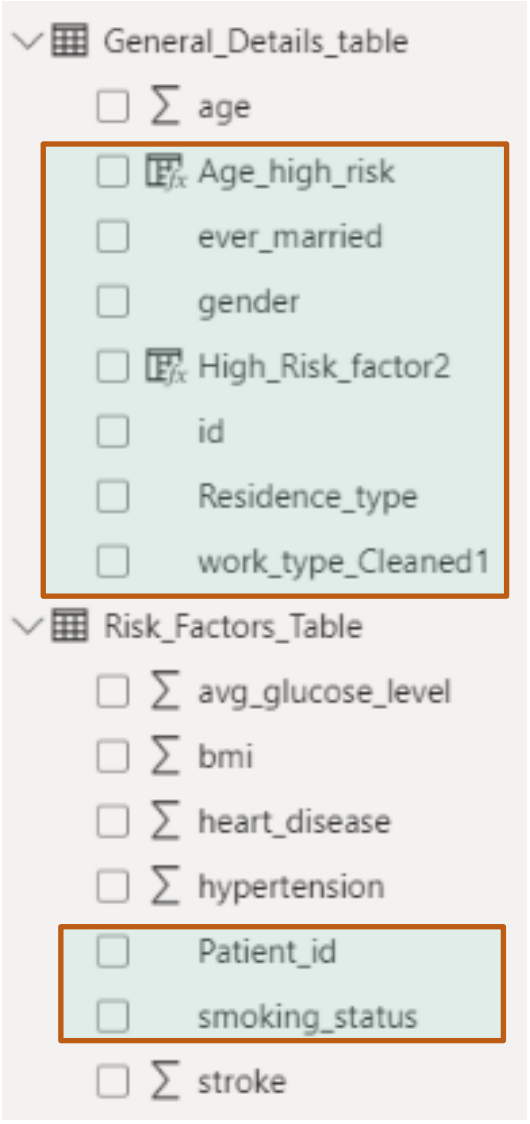
Contents

- DAX formulas
- Basic Visualizations
- Working with tables
- Working with measures
- Univariate Analysis

Stroke Case study

Step 5 - Univariate Analysis

Categorical Variables Exploration



Create Frequency Tables for categorical Variables

Age_high_risk	Count of id
Low Risk Age	3418
High Risk Age	1692
Total	**5110**

ever_married	Count of id
Yes	3336
No	1753
NA	21
Total	**5110**

Residence_type	Count of id
Urban	2593
Rural	2511
NA	6
Total	**5110**

smoking_status	Count of id
never smoked	1889
Unknown	1552
formerly smoked	882
smokes	787
Total	**5110**

gender	Count of id
Female	2985
Male	2113
NA	11
Other	1
Total	**5110**

High_Risk_factor2	Count of id
Low Risk2	4949
High Risk2	161
Total	**5110**

work_type_Cleaned1	Count of id
Private	2921
Self-employed	818
children	687
Govt_job	656
Never_worked	22
NA	6
Total	**5110**

Display Percentages along with counts

```
Percent_of_total =
COUNT(General_Details_table[id])/COUNTROWS(ALL(General_Details_table[id]))
```

Age_high_risk	Count of id
Low Risk Age	3418
High Risk Age	1692
Total	**5110**

ALL() is used to count rows beyond the selected context

Display Percentages along with counts

Age_high_risk	Count of id	Percent_of_total
Low Risk Age	3418	66.89%
High Risk Age	1692	33.11%
Total	**5110**	**100.00%**

Result will be a decimal value. Click on the measure and change the format

Final Result

Null values here can be cleaned

ever_married	Count of id	Percent_of_total
NA	21	0.41%
No	1753	34.31%
Yes	3336	65.28%
Total	**5110**	**100.00%**

Residence_type	Count of id	Percent_of_total
NA	6	0.12%
Rural	2511	49.14%
Urban	2593	50.74%
Total	**5110**	**100.00%**

smoking_status	Count of id	Percent_of_total
	12	0.23%
formerly smoked	882	17.26%
never smoked	1889	36.97%
smokes	787	15.40%
Unknown	1540	30.14%
Total	**5110**	**100.00%**

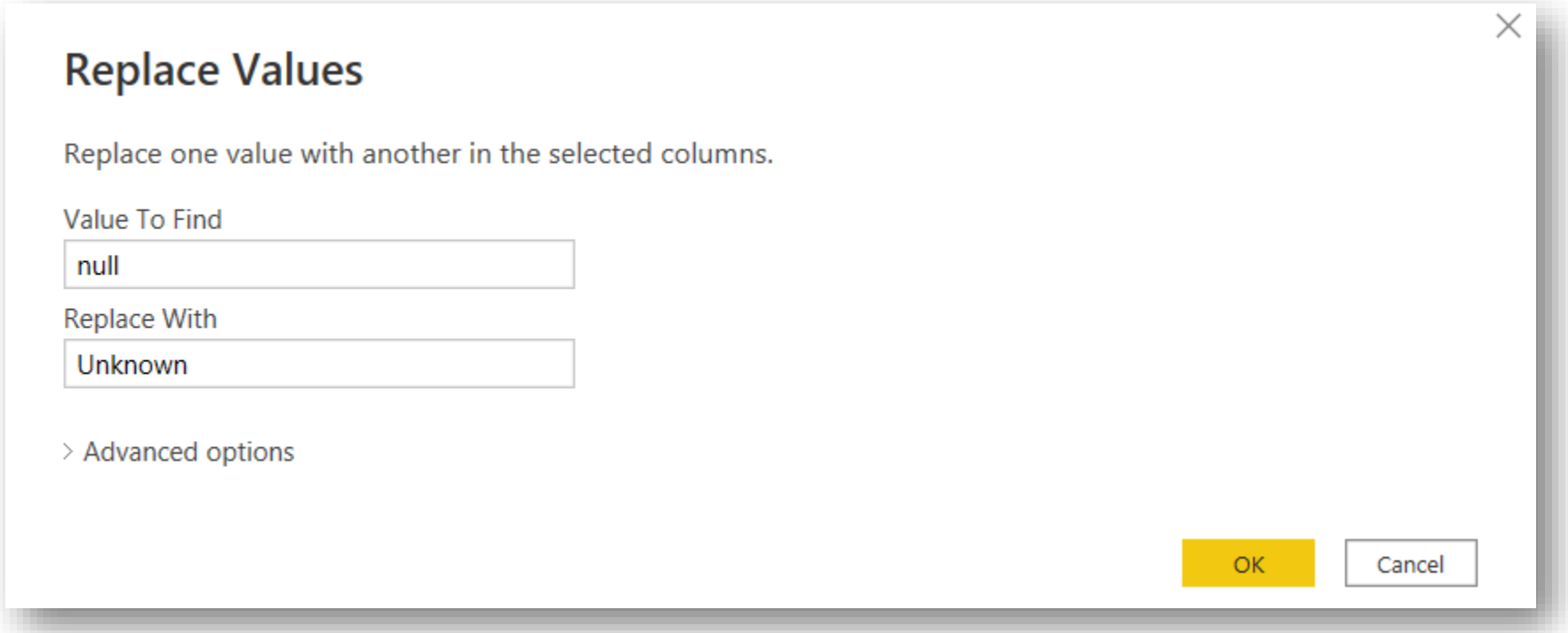
gender	Count of id	Percent_of_total
Female	2985	58.41%
Male	2113	41.35%
NA	11	0.22%
Other	1	0.02%
Total	**5110**	**100.00%**

Work_type_Clean	Count of id	Percent_of_total
children	687	13.44%
Govt_job	656	12.84%
NA	6	0.12%
Never_worked	22	0.43%
Private	2921	57.16%
Self-employed	818	16.01%
Total	**5110**	**100.00%**

Risk_Factor1	Count of id	Percent_of_total
High Risk Age	1692	33.11%
Low Risk Age	3418	66.89%
Total	**5110**	**100.00%**

Risk_Factor2	Count of id	Percent_of_total
High Risk2	161	3.15%
Low Risk	4949	96.85%
Total	**5110**	**100.00%**

Further Cleaning Smoking Status



Final Result

Age_high_risk	Count of id	Percent_of_total
Low Risk Age	3418	66.89%
High Risk Age	1692	33.11%
Total	**5110**	**100.00%**

Residence_type	Count of id	Percent_of_total
Urban	2593	50.74%
Rural	2511	49.14%
NA	6	0.12%
Total	**5110**	**100.00%**

gender	Count of id	Percent_of_total
Female	2985	58.41%
Male	2113	41.35%
NA	11	0.22%
Other	1	0.02%
Total	**5110**	**100.00%**

ever_married	Count of id	Percent_of_total
Yes	3336	65.28%
No	1753	34.31%
NA	21	0.41%
Total	**5110**	**100.00%**

smoking_status	Count of id	Percent_of_total
never smoked	1889	36.97%
Unknown	1552	30.37%
formerly smoked	882	17.26%
smokes	787	15.40%
Total	**5110**	**100.00%**

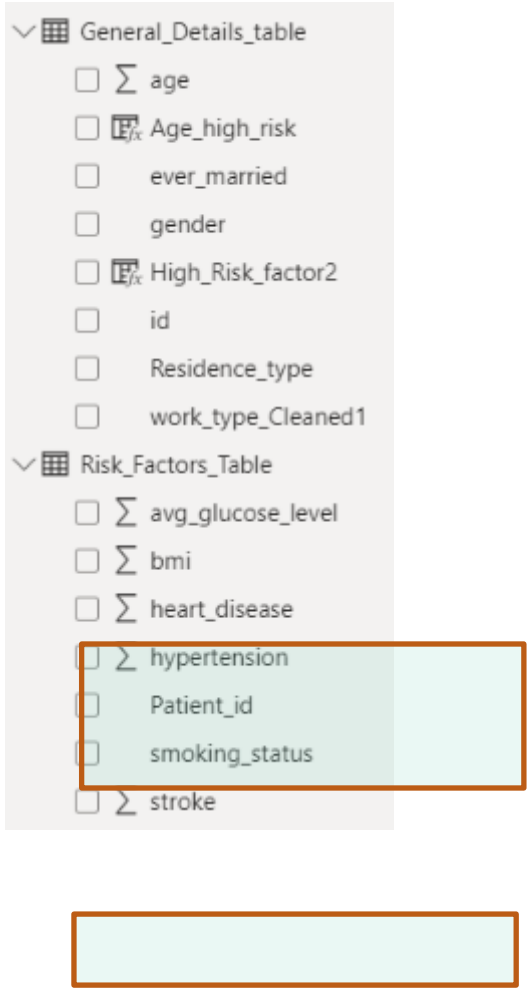
High_Risk_factor2	Count of id	Percent_of_total
Low Risk2	4949	96.85%
High Risk2	161	3.15%
Total	**5110**	**100.00%**

work_type_Cleaned1	Count of id	Percent_of_total
Private	2921	57.16%
Self-employed	818	16.01%
children	687	13.44%
Govt_job	656	12.84%
Never_worked	22	0.43%
NA	6	0.12%
Total	**5110**	**100.00%**

Interpretation

- Observe the percentage of each category
- Make a comment on top2 or top3 maximum frequency and minimum frequency items.
- For example, observe whether the data contain equal percentage of Male and Female population?

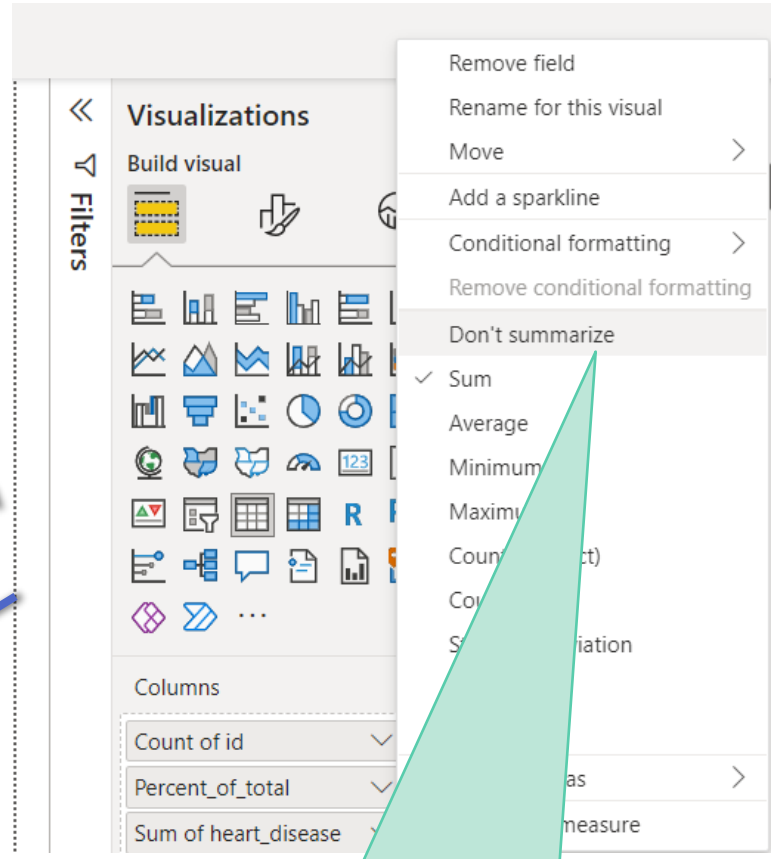
Discrete Variables



Discrete Variables – Exploration

Count of id	Percent_of_total	Sum of heart_disease
5110	100.00%	275

heart_disease	Count of id	Percent_of_total
	12	0.23%
0	4823	94.38%
1	275	5.38%
Total	**5110**	**100.00%**



Use this “Don’t summarize option”

Discrete Variables – Exploration

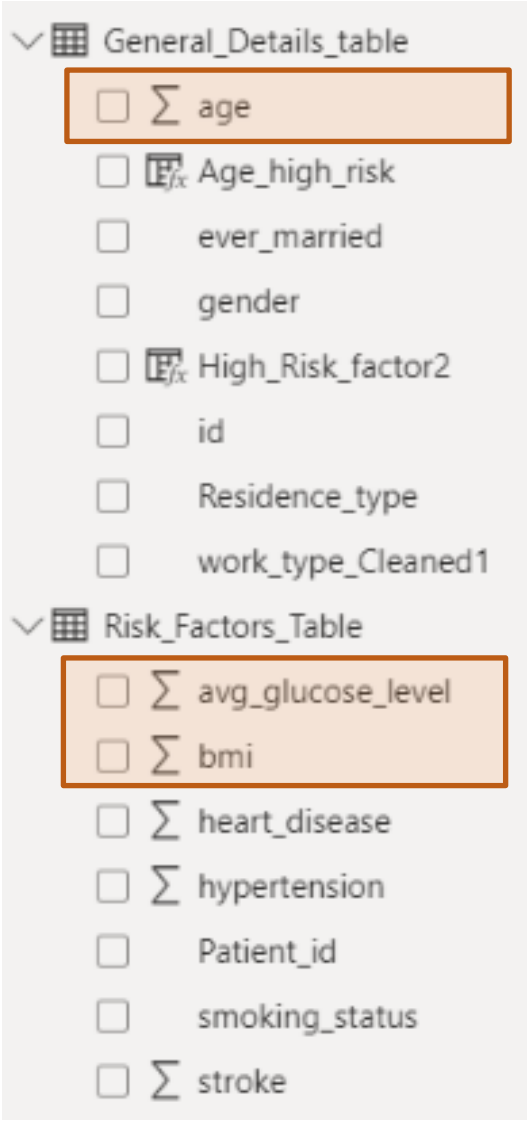
heart_disease	Count of id	Percent_of_total
0	4823	94.38%
1	275	5.38%
	12	0.23%
Total	**5110**	**100.00%**

stroke	Count of id	Percent_of_total
0	4861	95.13%
1	249	4.87%
Total	**5110**	**100.00%**

Count of id	Percent_of_total	hypertension
4601	90.04%	0
497	9.73%	1
12	0.23%	
5110	**100.00%**	

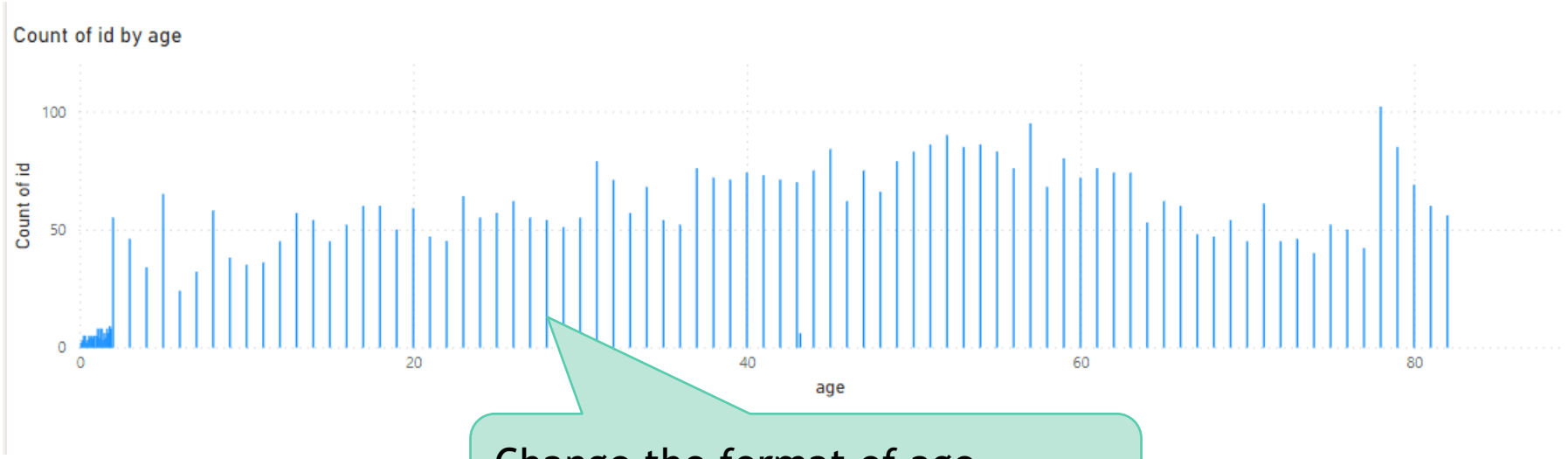
- Make a note of these missing values. We will handle them later

Continuous Variables

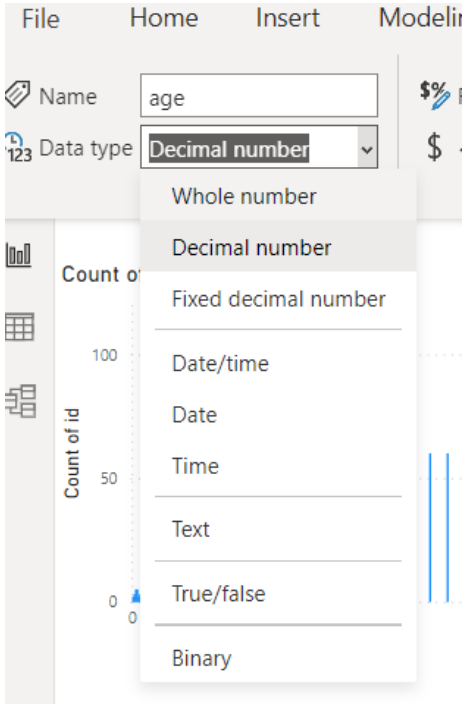


Distribution Charts

- Convert Age into an integer then draw the clustered column chart
- Clustered column chart >> age on X- axis >> Count of id on y-axis

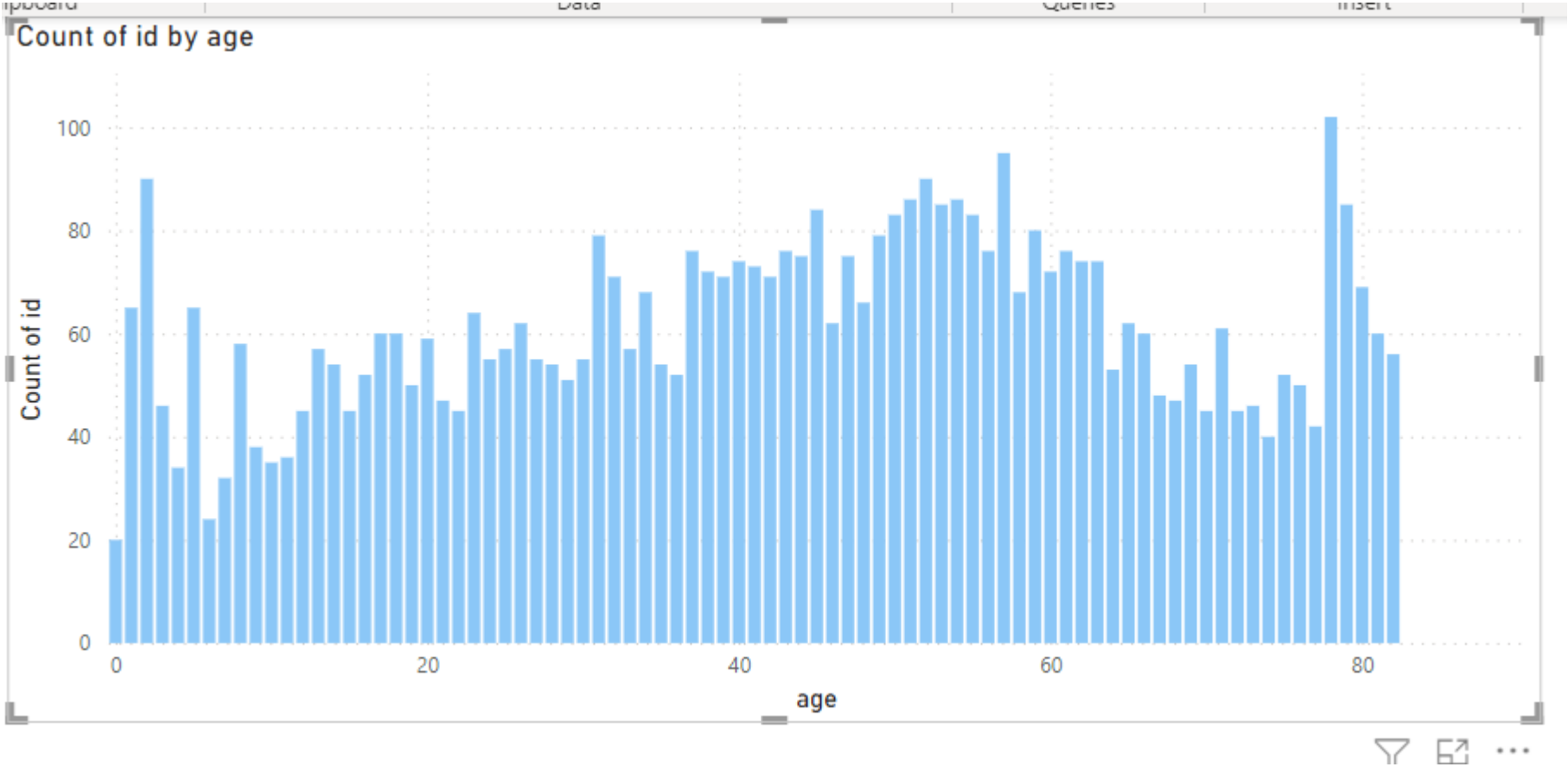


Change the format of age variable.



Distribution Charts

- Convert Age into an integer then draw the clustered column chart
- Clustered column chart >> age on X- axis >> Count of id on y-axis

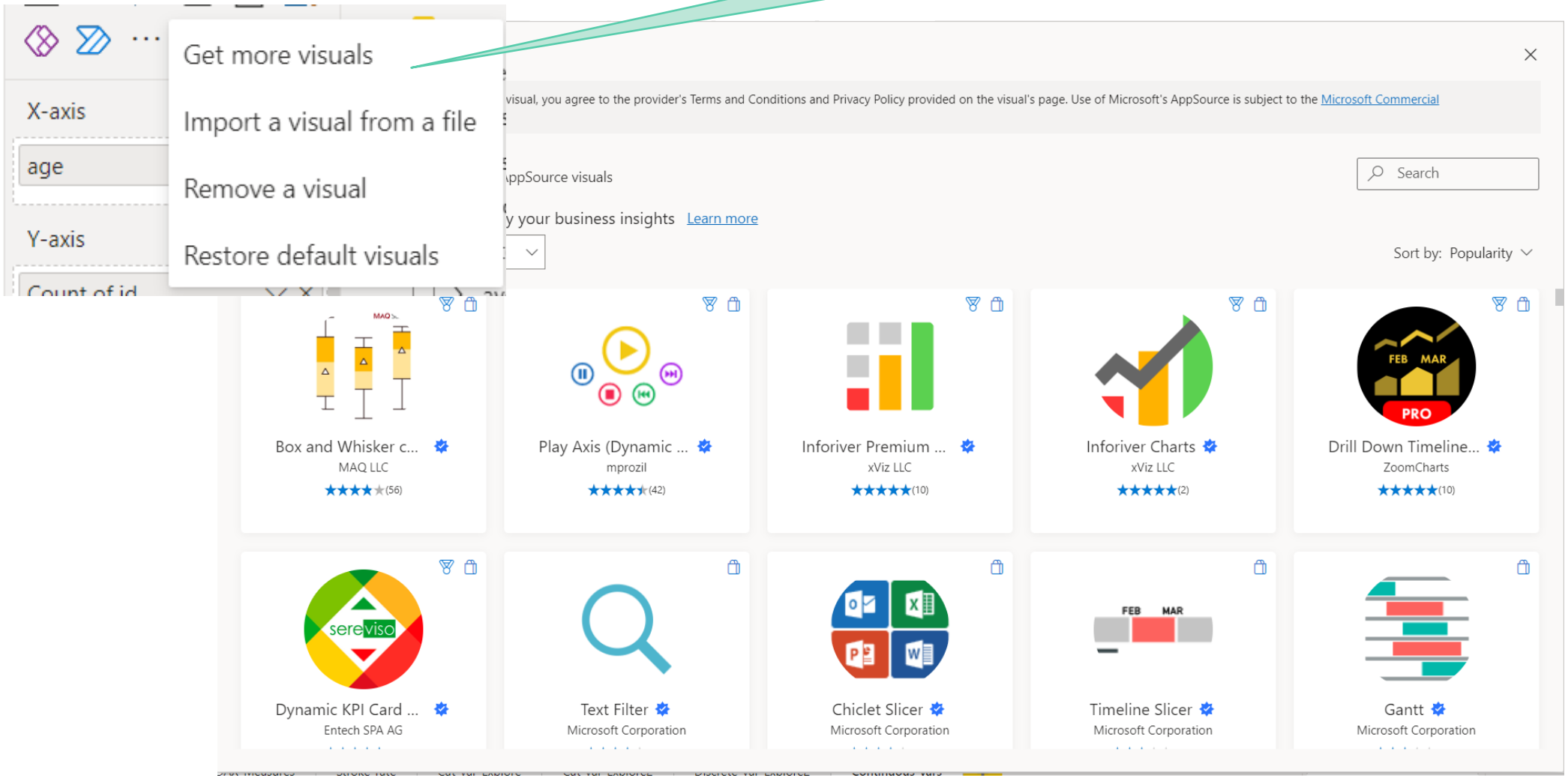


Box Plot and Violin Chart

- Histogram, Box Plot and Violin plot almost tell the same story.
- Box Plot and Violin plots need to be downloaded using “Get more visuals” option

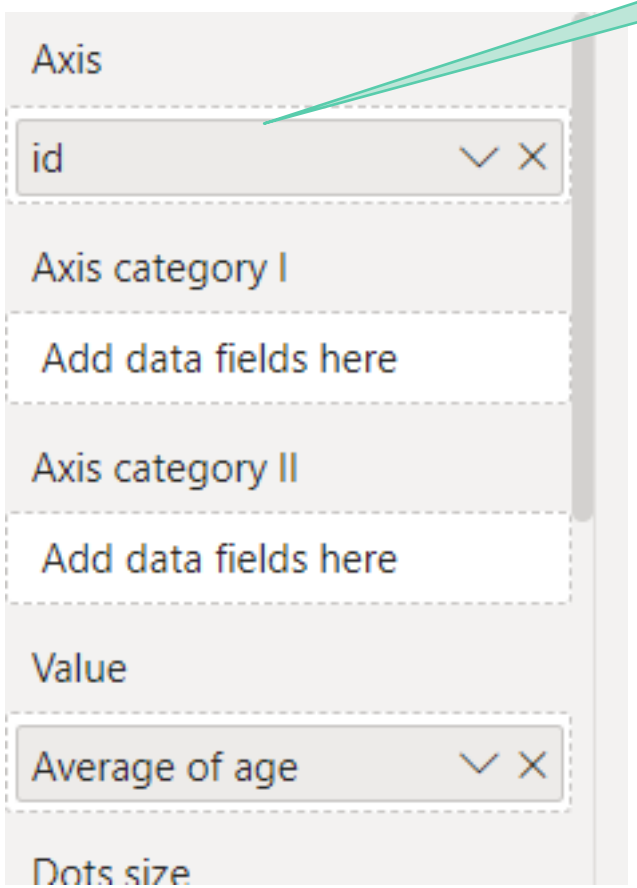
Get more visuals - option

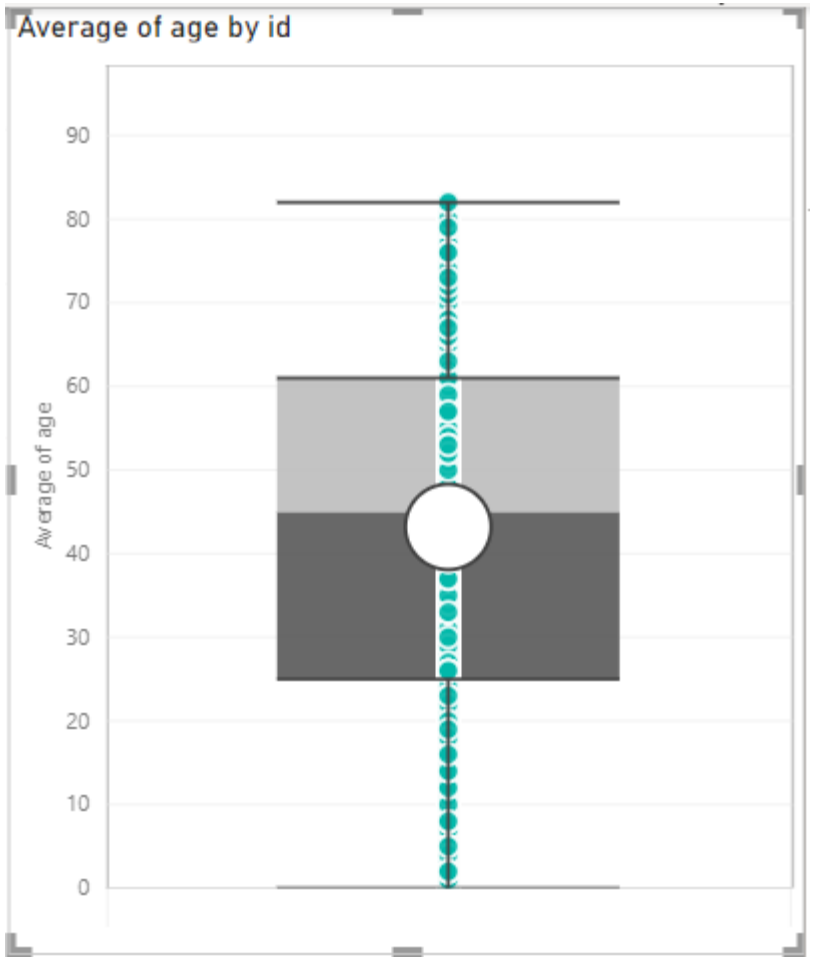
If more visuals doesn't work, then you import the visual from a file



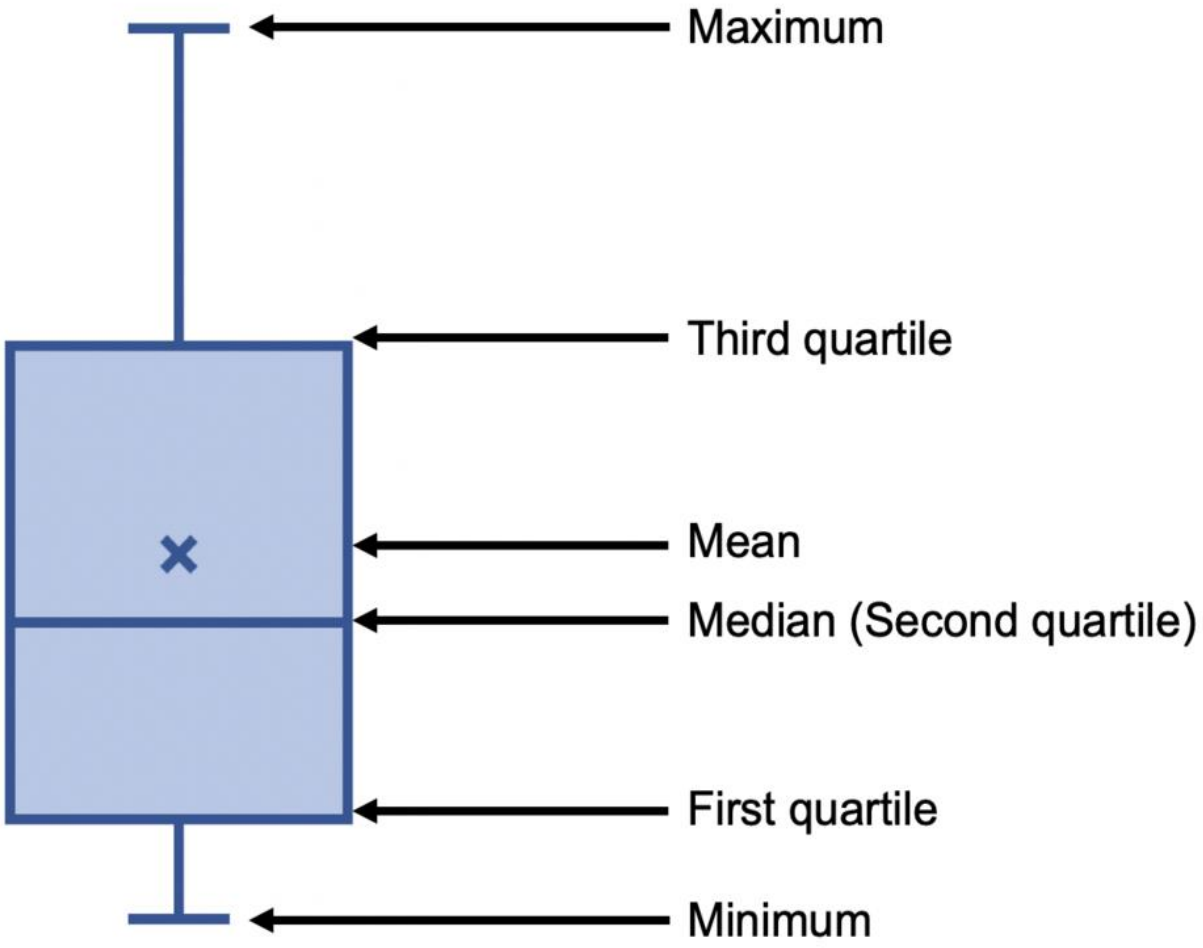
Box Plot options & Result

Id on Axis and age on Value



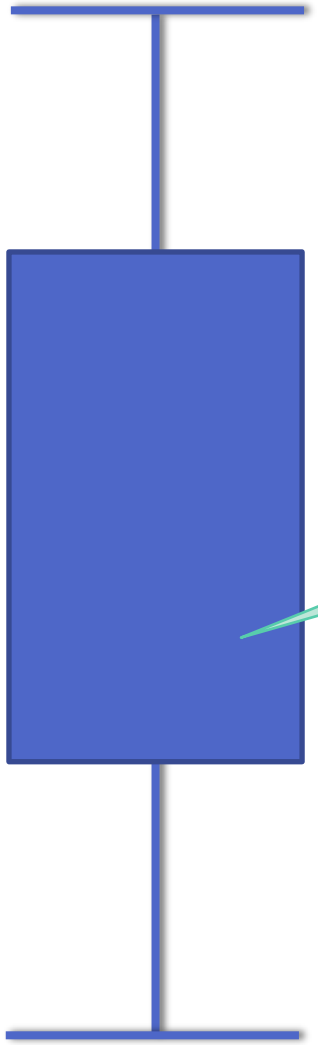


How to interpret a box plot?



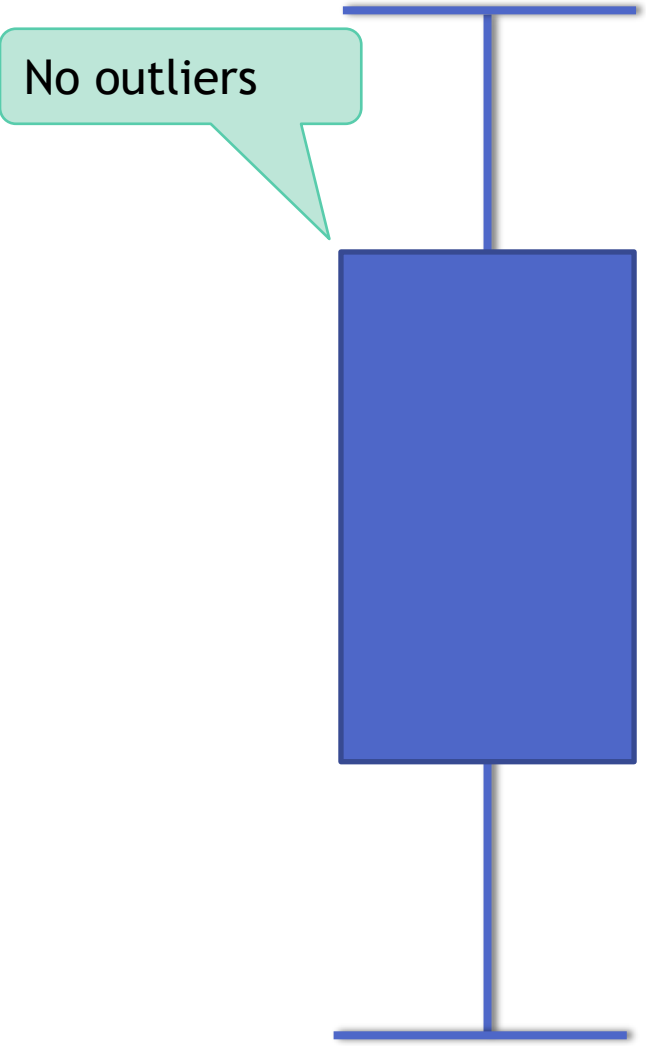
- 25% of the data lies below the first quartile value.
- 50% of the data lies below the second quartile value.
- 75% of the data lies below third quartile value.

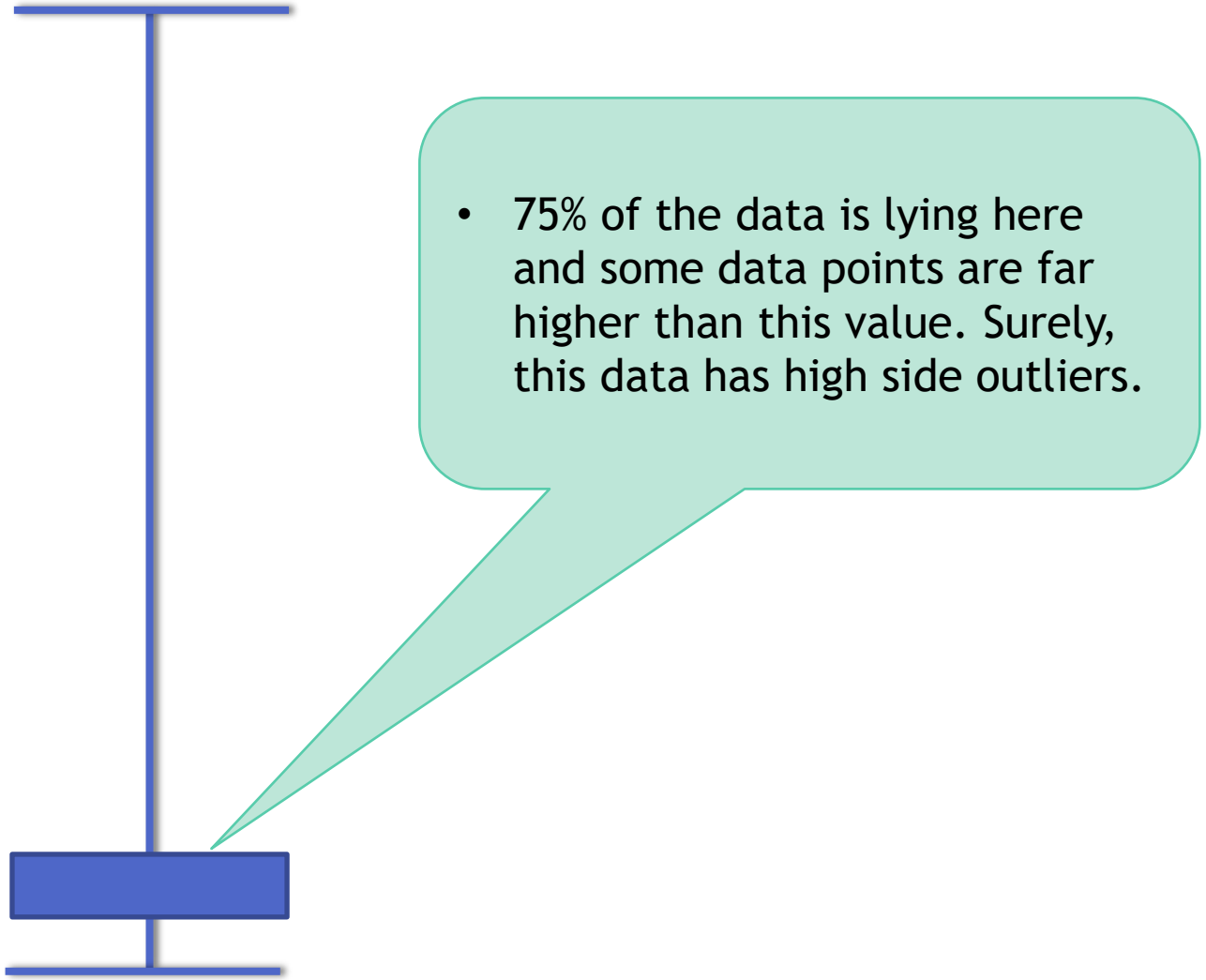
How to interpret a box plot?



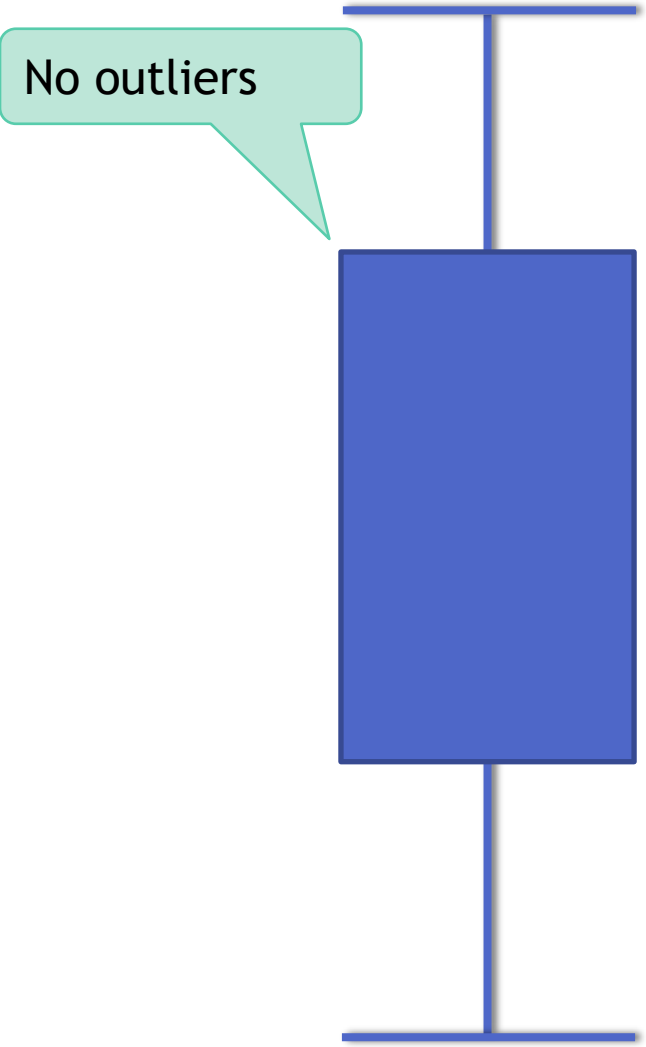
- If the box is well distributed like this, then there are no outliers in this variable

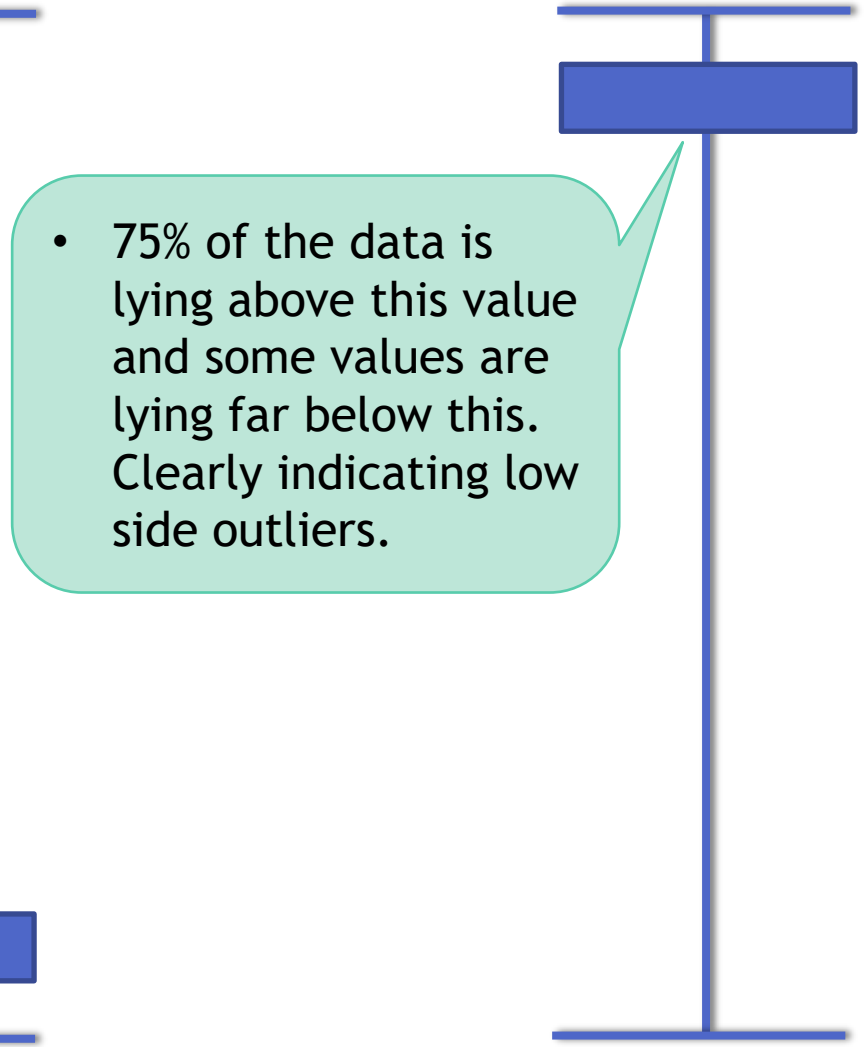
How to interpret a box plot?



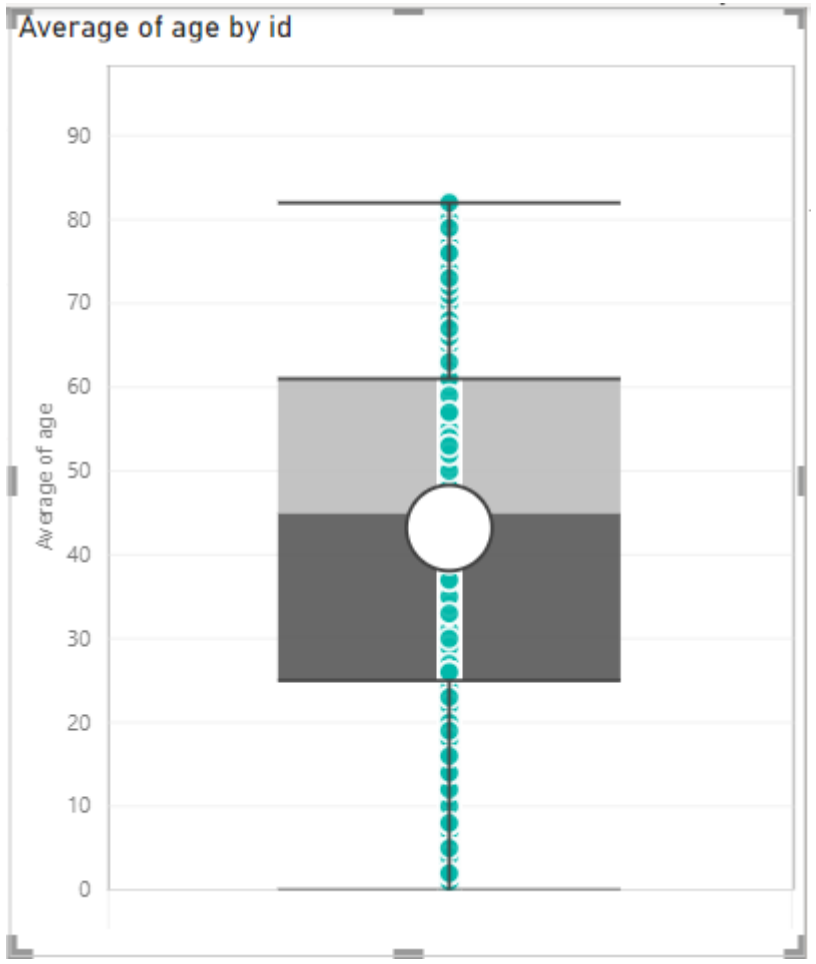


How to interpret a box plot?





How to interpret a box plot?



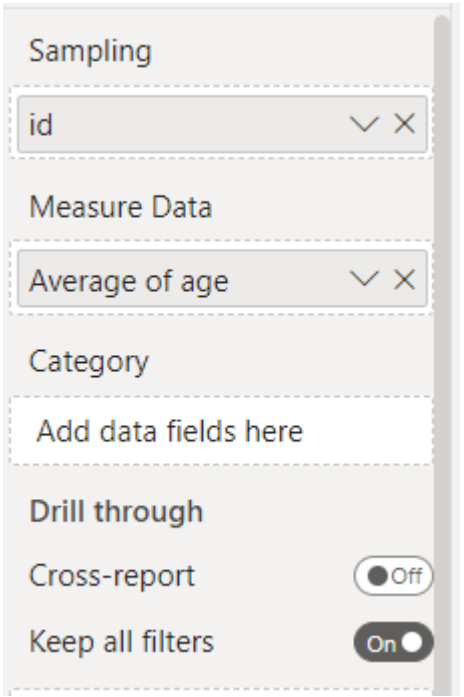
Median Type	Inclusive
Whisker Type	Min/Max
Mean	43.20
Quartile 1	25.00
Median	45.00
Quartile 3	61.00
Maximum	82.00
Minimum	0.00
IQR	36.00
Upper Whisker	82.00
Lower Whisker	0.00

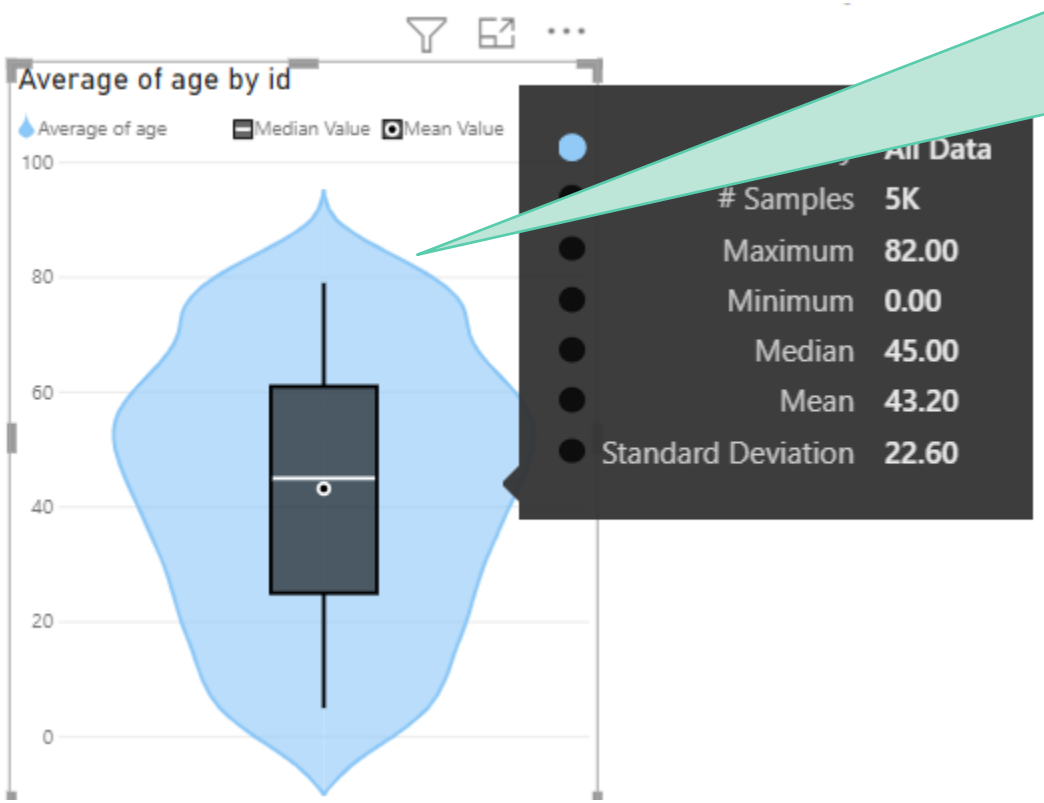
In the age variable

- 25% of the data lies below the first quartile value – Q1=25
- 50% of the data lies below the second quartile value- Q2=45
- 75% of the data lies below third quartile value. – 61

- There is a fair distribution, not many outliers are observed.

Violin Plot options & Result

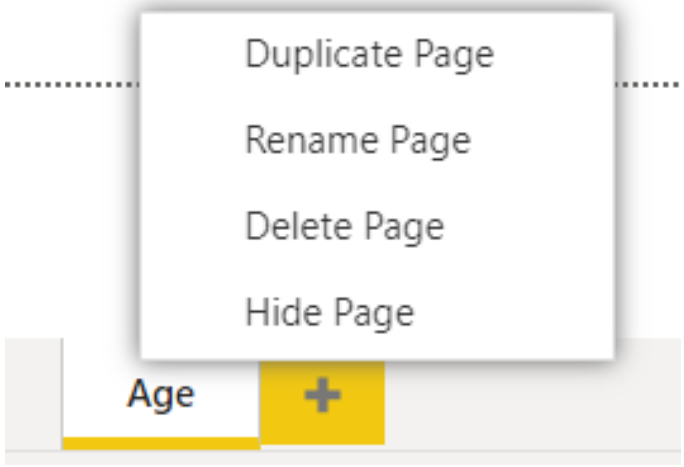




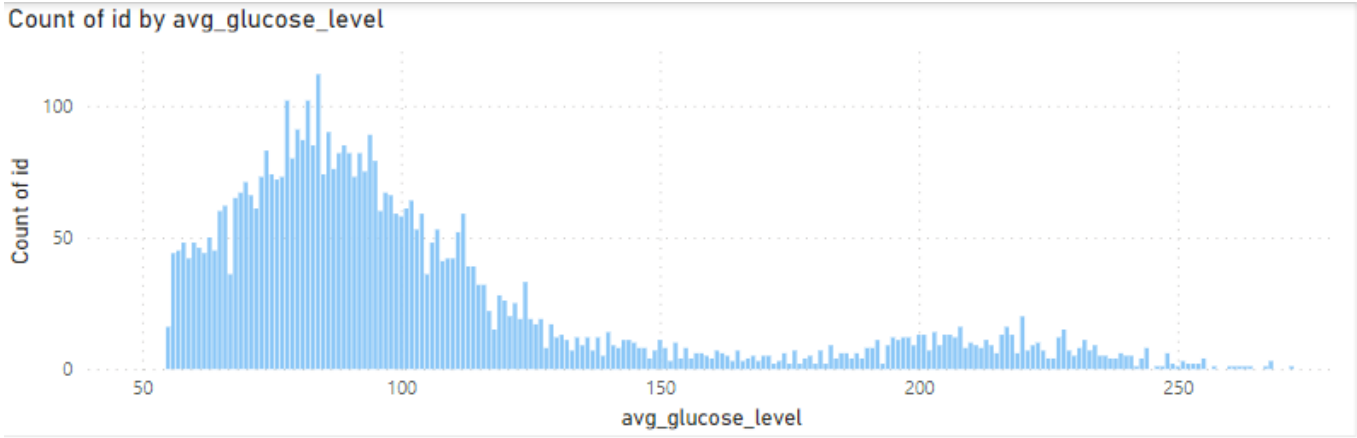
- Interpretation of violin plot is same as interpretation of box plot.
- A violin plot contains a box plot inside it.

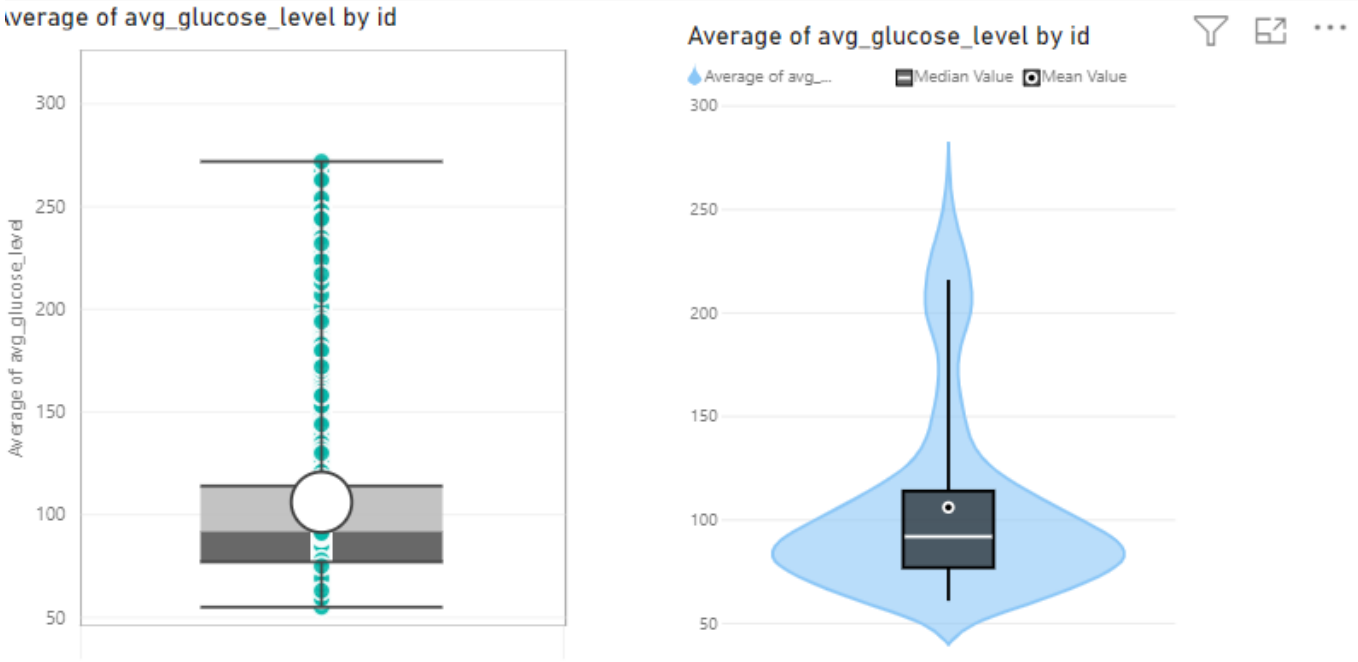
Avg Glucose Level variable

- Repeat the same graphs for this variable.
- Use Duplicate page option to save time.



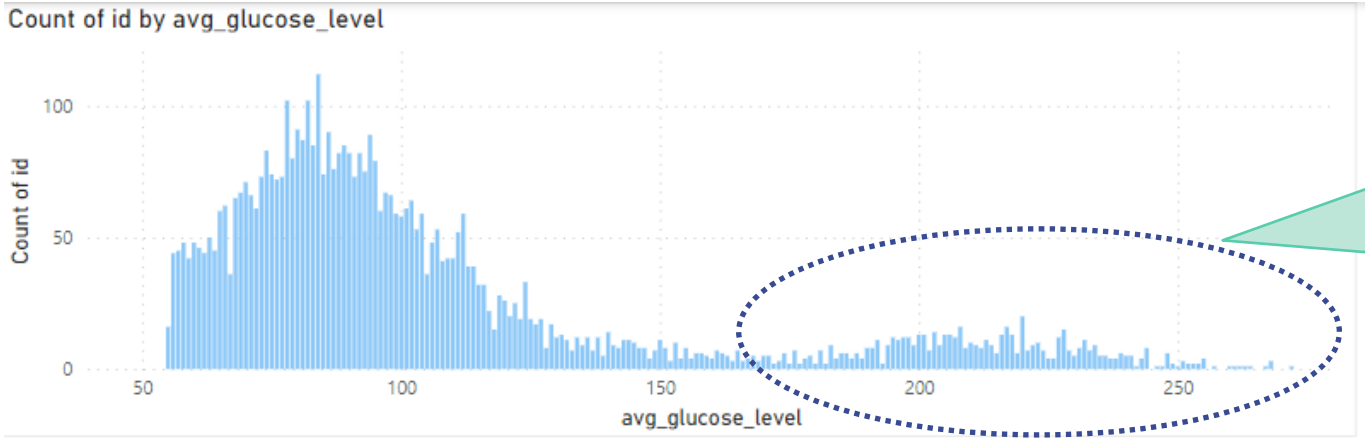
Avg Glucose Level variable

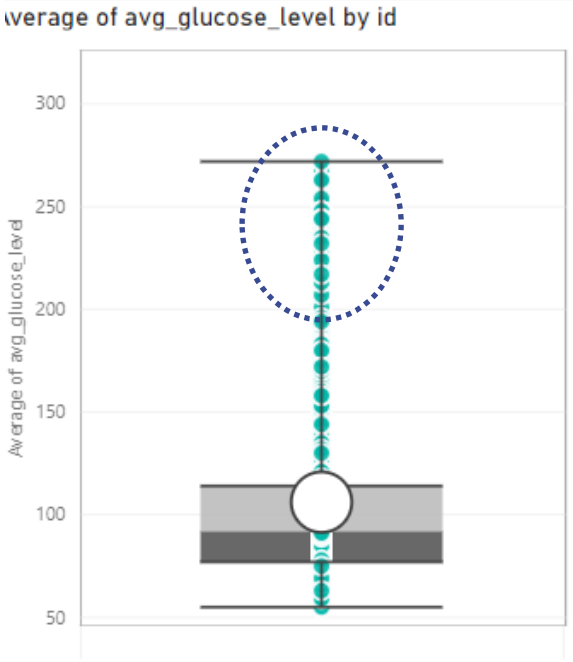


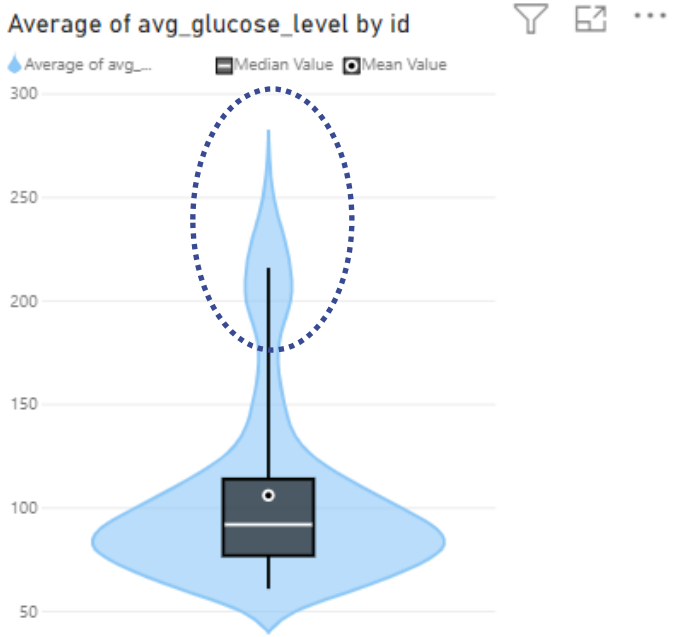


Median Type	Inclusive
Whisker Type	Min/Max
Mean	106.12
Quartile 1	77.00
Median	92.00
Quartile 3	114.00
Maximum	272.00
Minimum	55.00
IQR	37.00
Upper Whisker	272.00
Lower Whisker	55.00

Avg Glucose Level variable



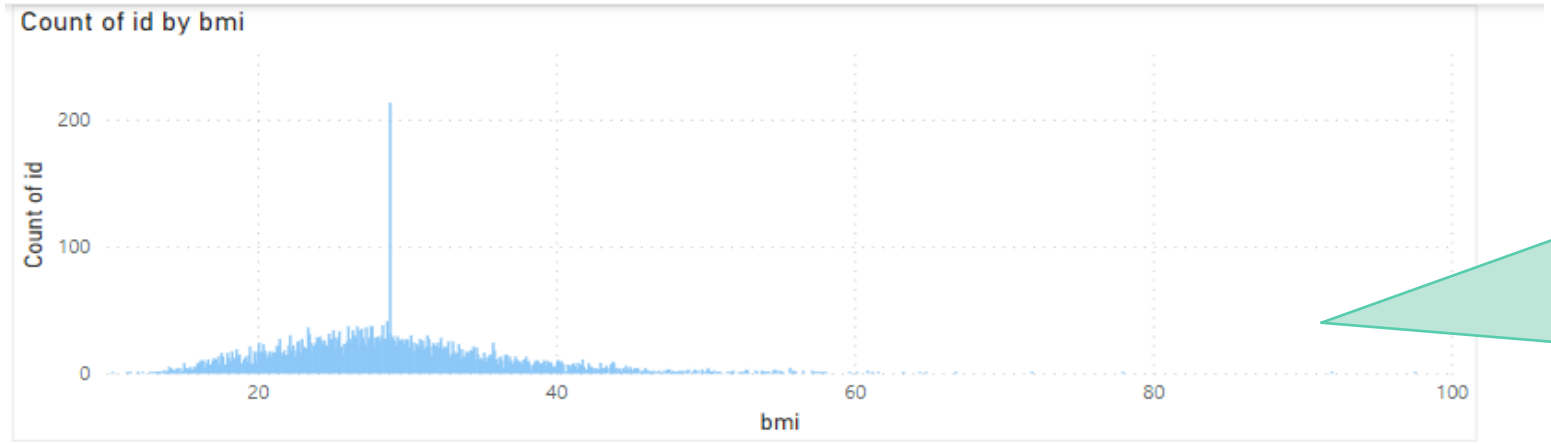




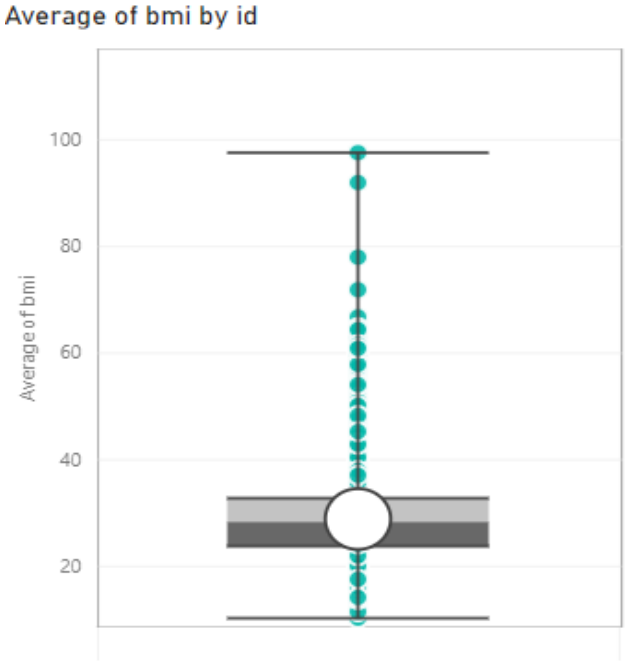
- All three graphs clearly indicating outliers
- We need NOT create all three graphs, Box plot is sufficient to detect the outliers in the data

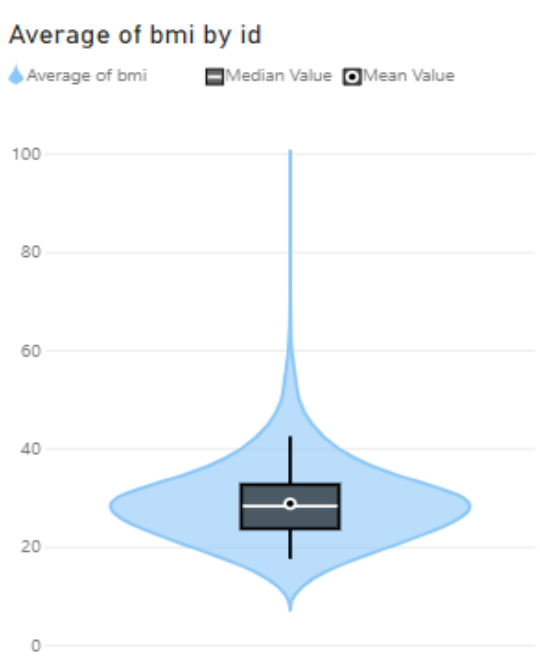
Median Type	Inclusive
Whisker Type	Min/Max
Mean	106.12
Quartile 1	77.00
Median	92.00
Quartile 3	114.00
Maximum	272.00
Minimum	55.00
IQR	37.00
Upper Whisker	272.00
Lower Whisker	55.00

bmi



- BMI also has outliers.
- 75% of the people have BMI<32. In some cases BMI is near to 97





Median Type	**Inclusive**
Whisker Type	**Min/Max**
Mean	**28.90**
Quartile 1	**23.80**
Median	**28.40**
Quartile 3	**32.80**
Maximum	**97.60**
Minimum	**10.30**
IQR	**9.00**
Upper Whisker	**97.60**
Lower Whisker	**10.30**

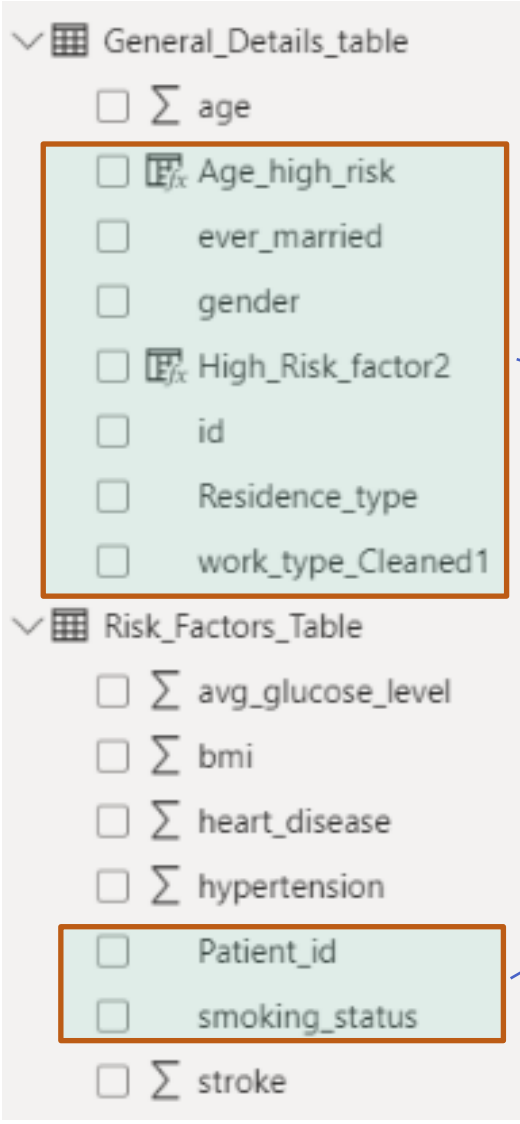
Stroke Case study

Step 6 – Bi-Variate Analysis

Bi-Variate Analysis

- Analyze every variable with respect to target.
- Identify the influential variables on the target.

Categorical Variables Exploration



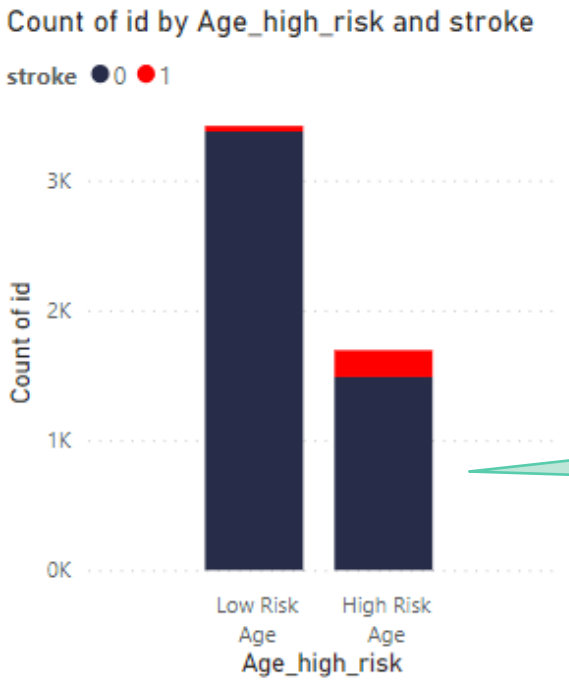
Stroke_rate
4.87%

stroke	Count of id	Percent_of_total
0	4861	95.13%
1	249	4.87%
Total	**5110**	**100.00%**

Relation between Stoke an High age risk factor

stroke	High Risk Age	Low Risk Age	Total
0	30.57%	69.43%	100.00%
1	82.73%	17.27%	100.00%
Total	**33.11%**	**66.89%**	**100.00%**

- Matrix >> Stoke on Rows >> Age_high_risk on columns>>Count of id on values. >> Click on Values >> Show value as >> percentage of row.

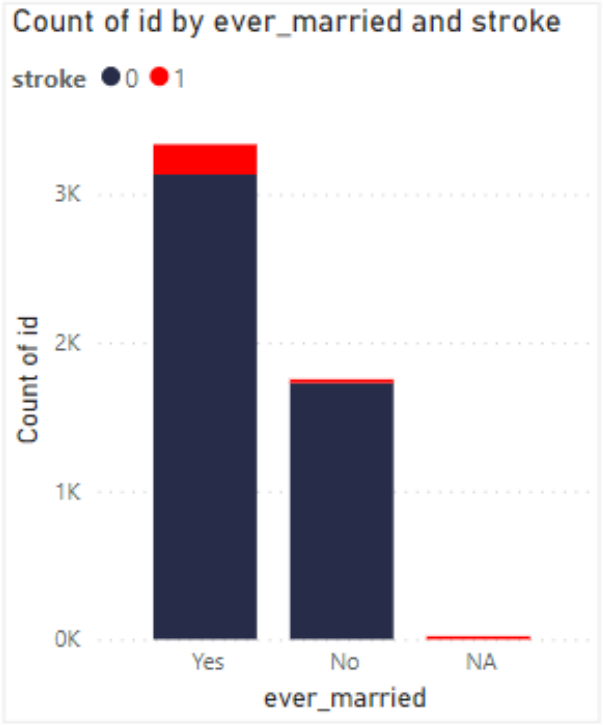


- Out of all the people who experienced stoke, we observed 82.73% are from high age risk factor. Where as only 33% belong to high age group.

- Stacked column chart >> Age_high_risk on X-axis >> Count of id on Y axis >> Legend >> Stroke.
- Format >> Columns >> Select a category>>More Colours

Stoke vs. Marital Status

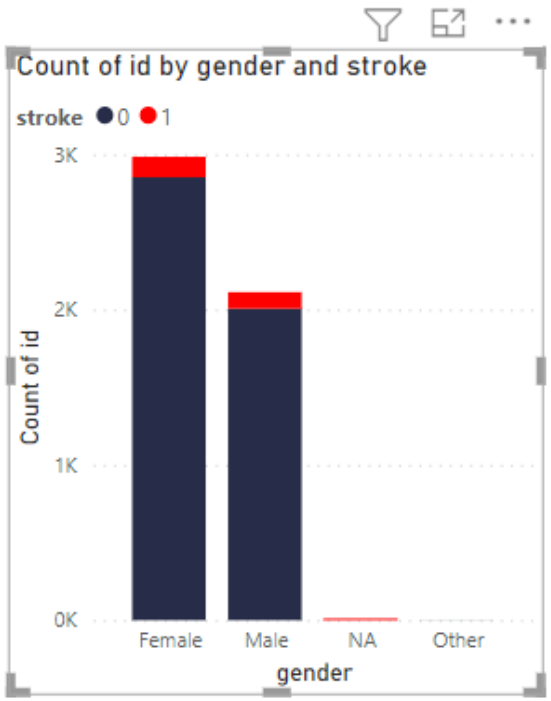
stroke	NA	No	Yes	Total
0		35.55%	64.45%	100.00%
1	8.43%	10.04%	81.53%	100.00%
Total	**0.41%**	**34.31%**	**65.28%**	**100.00%**



- Unmarried people have chances of stroke.
- This is a deceptive result. We need to be careful, usually unmarried people have less age, hence stoke cases percentage is less

Stoke vs. Gender

stroke	Female	Male	NA	Other	Total
0	58.69%	41.29%		0.02%	100.00%
1	53.01%	42.57%	4.42%		100.00%
Total	**58.41%**	**41.35%**	**0.22%**	**0.02%**	**100.00%**



- Male and Female have the same probably of getting stoke.

Categorical vs target

- There is one more way of performing the bi-variate analysis.
- We can show the stroke rate by each category

Stroke rate in each category

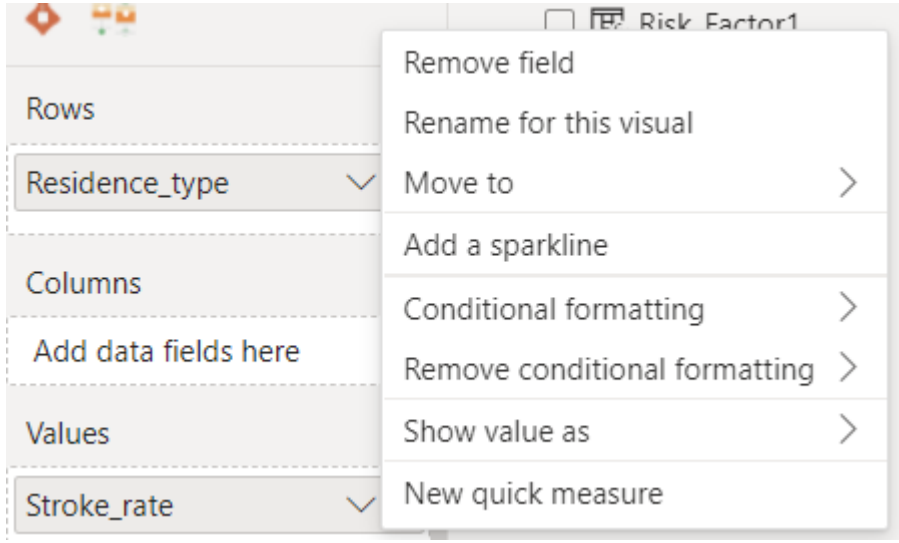
Age_high_risk	Stroke_rate
High Risk Age	12.17%
Low Risk Age	1.26%
Total	**4.87%**

ever_married	Stroke_rate
NA	100.00%
No	1.43%
Yes	6.09%
Total	**4.87%**

Residence_type	Stroke_rate
NA	100.00%
Rural	4.42%
Urban	5.09%
Total	**4.87%**

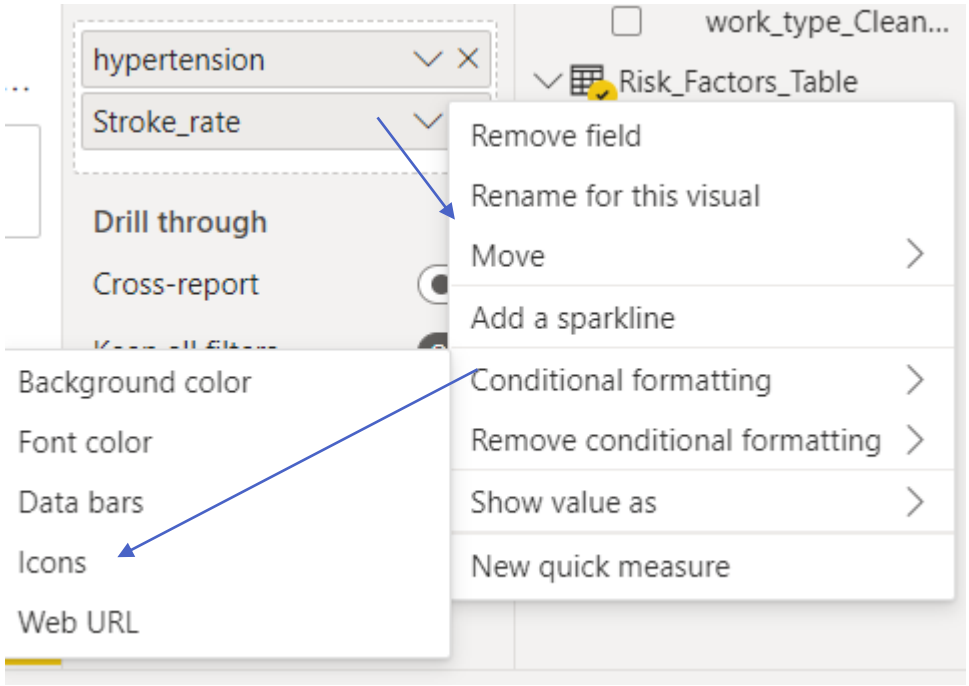
work_type_Cleaned1	Stroke_rate
children	0.29%
Govt_job	4.88%
NA	100.00%
Never_worked	0.00%
Private	4.96%
Self-employed	7.82%
Total	**4.87%**

smoking_status	Stroke_rate
formerly smoked	7.94%
never smoked	4.76%
smokes	5.34%
Unknown	3.03%
Total	**4.87%**



- How to perform Conditional Formatting ?
- Click on the stroke rate filed >> Conditional formatting >>Icons

Conditional formatting



Stroke rate in each category

Age_high_risk	Stroke_rate
High Risk Age	12.17%
Low Risk Age	1.26%
Total	**4.87%**

ever_married	Stroke_rate
NA	100.00%
No	1.43%
Yes	6.09%
Total	**4.87%**

gender	Stroke_rate
Female	4.42%
Male	5.02%
NA	100.00%
Other	0.00%
Total	**4.87%**

High_Risk_factor2	Stroke_rate
High Risk2	16.77%
Low Risk2	4.49%
Total	**4.87%**

Residence_type	Stroke_rate
NA	100.00%
Rural	4.42%
Urban	5.09%
Total	**4.87%**

work_type_Cleaned1	Stroke_rate
children	0.29%
Govt_job	4.88%
NA	100.00%
Never_worked	0.00%
Private	4.96%
Self-employed	7.82%
Total	**4.87%**

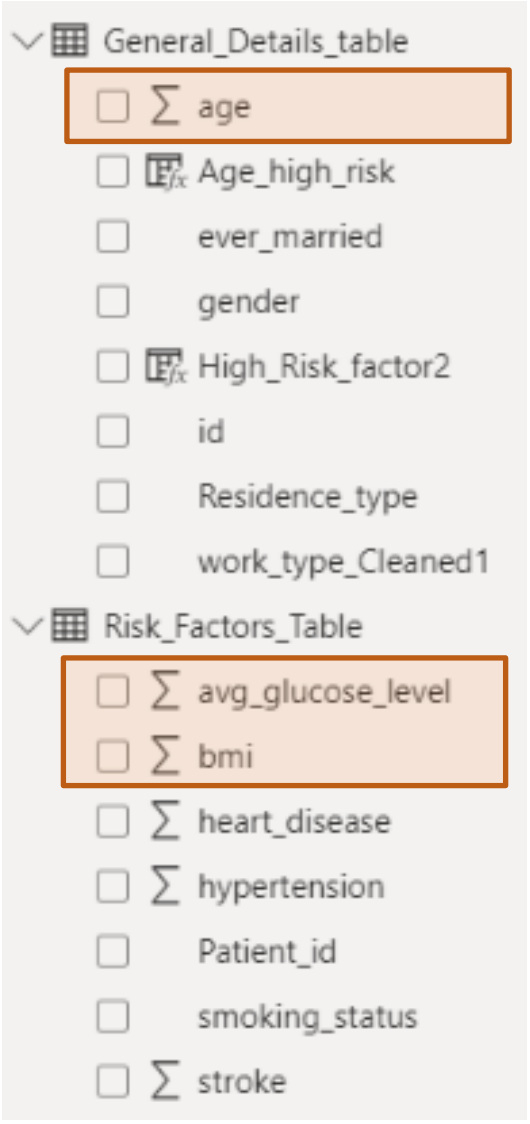
heart_disease	Stroke_rate
	0.00%
0	4.19%
1	17.09%
Total	**4.87%**

hypertension	Stroke_rate
	0.00%
0	3.98%
1	13.28%
Total	**4.87%**

smoking_status	Stroke_rate
formerly smoked	7.94%
never smoked	4.76%
smokes	5.34%
Unknown	3.03%
Total	**4.87%**

Some categories show really high stroke rate.

Continuous Variables vs. Target



Age vs Stroke

- Does Age have an impact on Stroke?

stroke	Average of age
0	41.97
1	67.25
Total	43.20

- We observed average age is for people who experienced stroke.

Continuous Variables vs. Target

stroke	Average of age
0	41.97
1	67.25
Total	43.20

stroke	Average of avg_glucose_level
0	104.59
1	132.54
Total	105.96

- Avg Glucose level seam to have some difference.

stroke	Average of bmi
0	28.83
1	30.22
Total	28.90

- BMI is almost same in stroke and non-stroke cases

Next Step

Step 7 – Multi-Variate Analysis