**Why we use 1.5 multiply with IQR in Outlier?**

Gaussian Distribution – In internet they explained in paras. Its difficult to understand for non tech BG.

In short – Based on Gaussian Distribution the whole data lies within 3 SD (standard deviation) (<3).

**Let’s calculate the IQR decision range in terms of Standard Deviation**

**Taking *scale:1***

**Lower Bound:**= Q1 - 1 \* IQR  
= Q1 - 1 \* (Q3 - Q1)  
= -0.675σ - 1 \* (0.675 - [-0.675])σ  
= -0.675σ - 1 \* 1.35σ  
= **-2.025σ**

**Upper Bound:**= Q3 + 1 \* IQR  
= Q3 + 1 \* (Q3 - Q1)  
= 0.675σ + 1 \* (0.675 - [-0.675])σ  
= 0.675σ + 1 \* 1.35σ  
= **2.025σ**

We get a value 2.025. This make the decision range too exclusive so it make too much outliers. So it is not applicable.

**Taking scale: 2**

Using the same formula :

We get a value 3.375. This make the decision range too inclusive so it make too fewer outliers. So, this is also not applicable.

**Taking scale:1.5**

Using same formula

We get value 2.7. This make the decision range is closest to the Gaussian distribution. So, we consider this for outlier detection.

**Resource:** **https://towardsdatascience.com/why-1-5-in-iqr-method-of-outlier-detection-5d07fdc82097#:~:text=Well%2C%20as%20you%20might%20have,perceived%20as%20outlier(s).**