BOXPLOT ANALYSER PRIVATE LIMITED
(PROFICIENCY TESTING PROVIDER DIVISION)

Robust estimation of standard deviation through MADe(x), Scaled Median Absolute Deviation*:*

Boxplot Analyser Private Limited - Proficiency Testing Div. has derived various ways to identify standard deviation which are alternatively called as a robust estimator for proficiency testing data analysis. One such way of estimation of standard deviation is Scaled Median Absolute Deviation, shortly we write as, ***MADe(X).***

Below easier example is an attempt to educate interested readers from proficiency testing (PT) participant communities to know how we use ***MADe(x)*** to estimate robust standard deviation whenever we require to use so. (We also use other estimation as well as per applicability)

Readers should understand that, more the data in the data set, better the estimation of standard deviation using ***MADe(x).***

When you consider **MADe(x)** for standard deviation estimation, the standard **breakdown point** 50% which is a good resistance for its robustness. With 50% breakdown point, this robust estimator is considerably suitable estimator for standard deviation.

Below example is used to know about using ***MADe(x)*** which is used as standard deviation:

Sr. No.	Values, Xi	Absolute Differences di = | Xi - med(x) |
1	20.5	1.8
2	21.1	1.2
3	21.5	0.8
4	22.3	0
5	22.7	0.4
6	23.6	1.3
7	20.9	1.4
8	21.4	0.9
9	23.5	1.2
10	22.3	0
11	23.5	1.2
12	22.5	0.2
median of values, med(x)	22.3	
median of absolute differences, med(d)		1.05
So, Scaled median absolute deviation, **MADe(x) = 1.483 X med(d)**		**1.557** (this is considered as standard deviation)

Note:
1.483 is a factor

Reference: ISO 13528:2022

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