

# MAT-203:00010

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1. The Life Ladder variable is a unit used by the U.N. to measure life quality, in which, the ladder steps represent how people feel about their everyday lives. The ladder ranges from 0 – 10 where the zeroth step means that the person is feeling that their life is at the worst possible state while the highest step or the tenth step means that the person is feeling that their life is at the best possible state.

The Positive Affect variable represents the measure of positive things or activities that the person had done or felt the day before. The value is an average of three different values, smile and laughter, occurrences of positive attitudes or feelings and amount of positive activities done by the person.

2. The instruction summarizes the raw CSV data by calculating the total, mean, quartiles and the min-max values for any numerical data categories, such as: Life Ladder, Log GDP per capita, Social Support, and so on.
3. According to the Life Ladder, the happiest country in the world is Finland with the Life Ladder measure of 7.699 and the unhappiest country is Afghanistan with the Life Ladder measure of 1.446.
4. The median of the healthy life expectancy at birth is 66.1 years
5. The first quartile of the negative affect is 0.229
6.
  - a.

	Value
Q1	4.647
Q2	5.449
Q3	6.324

b.

	Value	Robust
Median	5.863	1
Mean	5.621	0
Geometric Mean	5.485	0
Harmonic Mean	5.310	0
Trimmed Mean	5.691	1
Interquartile Mean	5.768	1
Winsorized Mean	5.620	1

Robust statistics have similar values to each other with only  $\pm 2$  difference the median, trimmed, interquartile and winsorized mean while non-robust statistics are more varied in their values.

c.

	Value	Bias Corrected	Robust
s1	1.135	1.142	0
s2	1.139		0
Range	6.253	-	0
IQR	1.807	1.340	1
MAD	0.794	1.176	1
AAD	0.939	1.177	1

Robust statistics (IQR, MAD, and AAD) values show a big difference after the data biases have been corrected along with how their data become more similar and close, meanwhile, the non-robust statistics (specifically: deviations) show small differences after data biases have been corrected.

d.

	Value
$g_1$	-0.632
$G_1$	-0.639

These two statistics both show a small negative skew in the Life Ladders data set.

e.

	Value	Excess kurtosis
$g_2$	3.117	0.117
$G_2$	3.166	0.166

All of these values have a slight positive kurtosis, however, the excess kurtosis is more close to a normal distribution.

7. Country name: Thailand – Subregion: Southeastern Asia – Variable: Freedom to make life choices

a.

	Value
Q1	0.900
Q2	0.926
Q3	0.956

b.

	Value	Robust
Median	0.926	1
Mean	0.900	0
Geometric Mean	0.896	0
Harmonic Mean	0.892	0
Trimmed Mean	0.900	1
Interquartile Mean	0.923	1
Winsorized Mean	0.900	1

In this case, Robust statistics still shows similar values with the trimmed mean and winsorized mean having the same value.

c.

	Value	Bias Corrected	Robust
s1	0.079	0.087	0
s2	0.084		0
Range	0.27	-	0
IQR	0.056	0.042	1
MAD	0.030	0.044	1
AAD	0.054	0.068	1

Robust statistics show a significant shift in their values after correcting data biases.

d.

	Value
$g_1$	-1.7826
$G_1$	-2.1608

This set of data still shows a negative skew – the graph of this distribution shifts to the right.

e.

	Value	Excess kurtosis
$g_2$	5.125	2.135
$G_2$	8.210	5.210

This data describes the thickness of the tail of the distribution in which, the positive value shows that the data mostly lies close to the central value.