Quiz 2

There are two widely recognized standardized tests for emotional intelligence. The first is called the INTUIT test, and scores on this test tend to be normally distributed, with mean 100 and standard deviation 10. The other test is called the EMPATH test, and scores on that test also tend to be normally distributed, but with mean 500 and standard deviation 75.

1. Suppose you take both tests, and score a 120 on INTUIT and 600 on EMPATH. On which test did you better? (in the sense of demonstrating superior emotional intelligence.) Justify your answer.

To figure out if people scored worse, first normalize (be skeptical) the

\[
Z = \frac{X - \mu}{\sigma}
\]

\[
\text{INTUIT} \quad \mu = 100, \quad \sigma = 10
\]

\[
Z_{\text{INTUIT}} = \frac{120 - 100}{10} = 2.00
\]

\[
\text{EMPATH} \quad \mu = 500, \quad \sigma = 75
\]

\[
Z_{\text{EMPATH}} = \frac{600 - 500}{75} = 1.33
\]

From our \( N(0,1) \) table, we know that is 98\% of the area to the left of \( Z \).

98\% of the area to the left of \( Z \). This means that the score on

\[
\text{INTUIT} \quad Z > 1.281
\]

is better than 98\% of other scores. So, your score on EMPATH better the

98\% of other scores. So, you did better on EMPATH.

2. Suppose your friend Bob takes INTUIT and scores a 95. What percentage of people who take INTUIT score lower than Bob?

Again, normalize \( Z = \frac{X - \mu}{\sigma} \), so the \( Z \) score for \( X = 95 \)

\[
Z = \frac{95 - 100}{10} = -0.5
\]

For the \( N(0,1) \) table, \( -0.5 \) of INTUIT get score more than Bob.

3. Suppose your 20 best friends all take INTUIT, and their scores are as follows:

90, 107, 109, 119, 88, 86, 92, 105, 94, 103, 94, 99, 109, 94, 104, 93, 95, 107, 107, 123

Form a normal quantile plot with this data and comment on whether you believe the INTUIT data is really normally distributed. (Attach your normal quantile plot to the back of your quiz.)

The normal quantile plot is approximately linear, but there are two

/huge outlier / at the top end of the data. There is also

a suspicious chunk of data in the center, but less above the

line, while the data might be normal, it is "it possible

that there are non-normal influences.