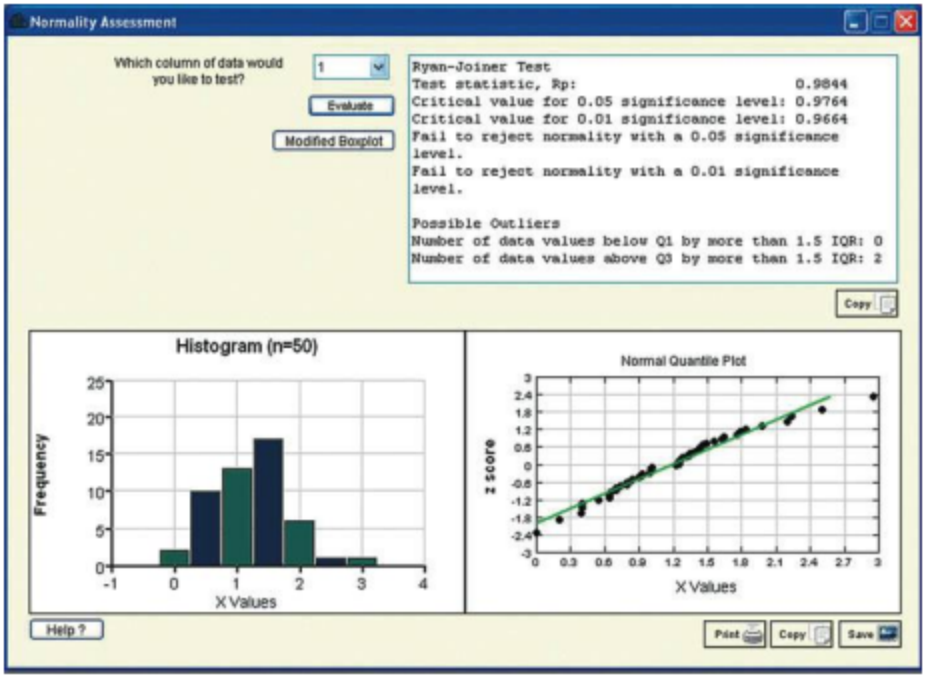
STATDISK



Let's use the display with the three criteria for assessing normality.

1. *Histogram:* We can see that the histogram is approximately bell-shaped.
2. *Outliers:* There are two possible outliers, but after sorting the data, we see that the five highest magnitudes are 1.98, 2.20, 2.24, 2.50, 2.95, so the possible outliers of 2.50 and 2.95 aren't too far away from the other data values.
3. *Normal quantile plot:* The points in the normal quantile plot are not far from a straight-line pattern, and there is no other pattern that is not a straight-line pattern. It is reasonable to conclude that the 50 earthquake magnitudes are from a population with a normal distribution.

Data Transformations Many data sets have a distribution that is not normal, but we can *transform* the data so that the modified values have a normal distribution. One common transformation is to transform each value of x by taking its logarithm. (You can use natural logarithms or logarithms with base 10. If any original values are 0, take logarithms of values of $x + 1$). If the distribution of the logarithms of the values is a normal distribution, the distribution of the original values is called a **lognormal distribution.** (See Exercises 22 and 23.) In addition to transformations with logarithms, there are other transformations, such as replacing each x value with $\sqrt{x}$, or $1/x$, or x^2. In addition to getting a required normal distribution when the original data values are not normally distributed, such transformations can be used to correct deficiencies, such as a requirement (found in later chapters) that different data sets have the same variance.

using TECHNOLOGY

STATDISK STATDISK can be used to generate a normal quantile plot, and the result is consistent with the procedure described in this section. Enter the data in a column of the Sample Editor window or open a data set. Next, select **Data** from the main menu bar at the top. Select **Normal Quantile Plot** to generate the graph. Better yet, select **Normality Assessment** to obtain the normal quantile plot included in the same display with other results helpful in assessing normality. Proceed to enter the column number for the data, then click **Evaluate.**

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