



**Description:**  
**The Picture Worth The Thousand Words**



Now, data analysis: The data have passed the test of step zero — the data are worth a look. We are about to look at the data for a single variable and to look inside the data for patterns. The key to the process is to use the best pattern recognizing device at our command: the human eyeball, with brain attached.

For this reason a large part of data analysis consists of preparing data in such a way that our native equipment can do its work. To feed intuition, we prepare graphs, the pictures that are worth a thousand words. Then we look at them and think.

Rivet your attention on this business of making pictures and avoid certain mistakes. It is a mistake to think of a picture, which is easy to look at, as less sophisticated than mathematics. That may or may not be true, depending on context. And in the context of data analysis we are looking, literally *looking* for patterns. In the trade, numbers — means, medians, measures of variation, and so forth — are referred to as “summary statistics”. And this is what they summarize, the picture, or more precisely, the pattern of the data which is made visible by a well made visual representation of the data.

You have to be careful: The eyeball may, at times, be “too good,” causing us to see patterns when they aren’t there. And the eyeball can, at times, “see” what we expect it to see, instead of what’s there. But the fact remains that the eye, the brain, and human intuition are the best tools we have for finding patterns. We label graphs because our intuition will be fed by the labels. To protect ourselves from error, we prepare we charts and graphs from which errors will stand out visually, as breaks from a pattern — and be corrected.

So we begin by looking at the data, beginning with one variable, and using a technique known as the “Stem and Leaf”.<sup>2</sup>

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<sup>2</sup> From John Tukey’s *Exploratory Data Analysis*, Chapter 1, “Scratching Down Numbers”, Addison Wesley, 1977.