**Objectives**:

* To understand the meaning of the phrase ***statistical tendency***
* To learn a formal rule-of-thumb for determining whether an observation is an ***outlier***
* To discover ***modified boxplots*** as displays conveying more information than ordinary boxplots
* To acquire extensive experience with using graphical, numerical, and verbal means of comparing and contrasting distributions from two or more groups
* To use the computer as an important tool for performing such analyses

***Statistical tendency*** Though each individual observation may not agree, you look for a tendency - or in other words for most observations what is happening. This is the statistical tendency. *e.g.* Men tend to be taller than women, This is not the case for every man and every women but there is a tendency.

***Five-number summary*** is made up of the minimum and maximum observations along with the lower, middle (median) and upper quartiles.



***boxplot*** uses the *five-number summary* to create a visual display of a distribution. To create a *boxplot* first draw a number line with a proper scale to illustrate the observations being displayed. Draw a *box* with one end at the lower quartile and the other end at the upper quartile. draw a dotted line in the box at the median. Draw “whiskers” from each end of the box to the minimum and the maximum.

***Modified boxplots*** for normal data with no outliers the standard boxplot is useful, but whenever an outlier is present that outlier takes the whisker well beyond where the non-”screwed-up” data is. *i.e.*  if we were to do a boxplot of income, The whisker would have to go all the way out to Ross Perots income - this does not help us distinguish the typical upper income.

***Outliers:*** To overcome this problem we find the value of 1.5\**IQR* let the whisker go out to this value if the data goes out this far. Any data beyond this value will be denoted by a “\*” in the boxplot.