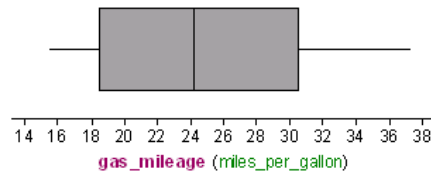# CAUTIONS about Box Plots and Modified Box Plots
(A.k.a. Avoiding Common Errors in Creating Box Plots and Modified Box Plots)
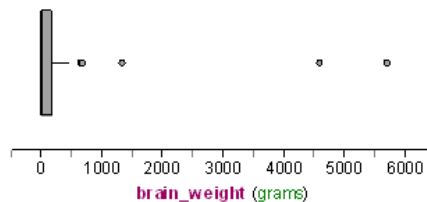
Carefully examine the Box plots and modified Box plots that have been provided as examples in the PowerPoint class notes (Measures of Center and Spread) as well as the Box plot and the modified Box plot provided below. Notice that *NONE* of these graphs have notations or numbers/values provided on the graph for the median, lower quartile, upper quartile, minimum, maximum, lower fence, upper fence, IQR, or outliers. Such notations on the graphs in the textbook are provided *only* to help the reader to understand the graphs – neither these notations nor the corresponding numerical values should *EVER* be put on your graphs. That is, the following two (2) graphs are *correct* Box plots – the first a correct, properly labeled Box plot,

Box Plot for the gas mileage for 1978-79 model cars as measured by Consumers' Union on a test track

gas_mileage (miles_per_gallon)

and the second a correct, properly labeled modified Box plot.

Modified Box Plot for the Brain Weight for a Sample of Mammals

brain_weight (grams)

Notice that neither Box plot has strange little labels and neither Box plot has any numbers written near the outliers, the minimum, the maximum, the lower quartile, the upper quartile or the median. In addition, notice that neither the lower fence nor the upper fence is included in *either* graph.

Each Box plot has
- an appropriate and meaningful title,
- a meaningful scale with numbers and equally spaced tick marks to indicate the location of the corresponding numerical values,
- an appropriate and meaningful horizontal axis label (the variable being examined) with its appropriate units,
- no vertical axis, and
- appropriately graphed values of the five number summary.

For the modified Box plot, the graph has
- outliers that are indicated with a point or a star, here, the point is used.

Notice that there are
- no balls at the end so the whiskers for either the Box Plot or the modified Box Plot, and, finally,
- the Box plot and the modified Box plot are above the horizontal axis and *never* touch the horizontal axis.

It is important that you practice making Box plots and modified Box plots so that you will be able to make them on examinations and quizzes.