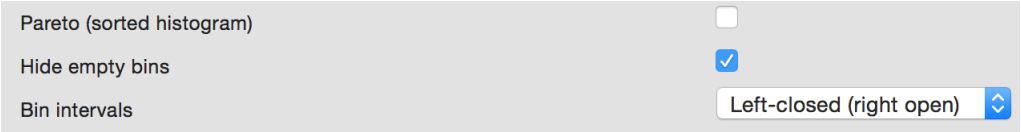
# Histogram

The command produces histograms for selected variables. A histogram is a graphical display of tabulated frequencies, shown as bars, that indicates what proportion of cases fall into each of several categories (bins). By default, a histogram has left closed, right open intervals. To plot a histogram for one or multiple categorical variables use the **FREQUENCY TABLES (DISCRETE DATA)** command.

## How To

- ✓ Run**: STATISTICS->BASIC STATISTICS->HISTOGRAM...**
- ✓ Select one or more variables. A histogram is created for each variable.
- ✓ Optionally, select a **BIN VARIABLE**. A bin variable contains boundary values that define bin ranges. If a bin variable is not selected, a set of evenly distributed bins between the variable's minimum and maximum values is created, the number of bins *k* is defined as $k = \lceil log_2 N \rceil + 1$, and *N* is the total number of observations (Sturges, 1926).
- ✓ Optionally, select a **FREQUENCY VARIABLE**. Frequency variable contains the number of observations that each row represents. *When omitted, each row represents a single observation.*
- ✓ Optionally, select a **BREAK VARIABLE**. Break (layer) variable distinct values will cause separate histograms to be generated for each variable.
- ✓ Frequency and layer variables size must match the input variables cases count.
- ✓ The **HIDE EMPTY BINS** option is intended to hide/show empty bins in a frequency table.
- ✓ **PARETO (SORTED HISTOGRAM)** – if selected, bins in the output table are presented in descending order of frequency. Otherwise, bins are presented in ascending order of the upper boundary.




## Results

A frequency distribution table and a histogram are produced for each input variable and for each level of the break variable (if used). Table contains following values:

$x_i$ **TO** $x_{i+1}$ - bin range.

**COUNT** - the number of observations within a bin range.

**CUMULATIVE COUNT** - the number of observations with the value less than *or equal* to the right boundary of the bin (for left-closed bins – *strictly less* than the right boundary of the bin).

**PERCENT** – percentage of observations compared to the count of all observation.

**CUMULATIVE PERCENT** - percentage of the observations with the value less than *or equal* to the right boundary of the range compared to the count of all observation.

## References

Sturges, H. A. (1926). The choice of a class interval. Journal of the American Statistical Association, 21, 65-66.

Velleman, P. F., & Hoaglin, D. C. (1981). Applications, basics, and computing of exploratory data analysis. Boston, Mass: Duxbury Press.